

ATTACHMENT

to

Division's Response to Board's Order on Remand, and Petition for Rehearing

Filed January 10, 2002

TITLE: *UDOGM State Decision Document and Technical Analysis
- Response to Board's Order - Updated January 9, 2002*

File in:

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Refer to Record No 0044 Date 1-10-02
In C/007/013, 2002, Internal
For additional information

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

RESPONSE TO BOARD ORDER

UtahAmerican Energy, Inc.
HORSE CANYON MINE
Lila Canyon **Revision** **Extension**
C/007/013

~~July 27~~ January 9, 2001+2

CONTENTS

- * Administrative Overview (Updated to January 9, 2002)
- * Location Map (No Change)
- * Permitting Chronology (Updated to January 9, 2002)
- * Mine Plan Information (Updated to January 9, 2002)
- * Findings (Updated to January 9, 2002)
- * Permit (Updated to January 9, 2002)
- * Technical Analysis (Updated to January 9, 2002)
- * Analysis and Finding on the Lila Canyon Road (No Change, not included)
- * Analysis and Finding that the Lila Canyon extension to the Horse Canyon Mine is processed as a new permit.
- * Cumulative Hydrologic Impact Assessment (CHIA) (Updated to January 9, 2002)
- * Affidavit of Publication (No Change)
- * 510 (C) (Applicant Violator System (AVS)) Compliance Review Memo (Updated to January 9, 2002)

- * Letters of Consultation and Concurrence (No Change, not included)
 - Fish and Wildlife Service, April 14, 1999, October 14, 1999, April 28, 2000, and July 18, 2001
 - Division of Wildlife Resources, April 15, 1999
 - School and Institutional Trust Lands Administration, April 9, 1999
 - Cultural Resource Consultation with SHPO, April 18, 2001

- * Lease and NEPA Documents (No Change, not included)
 - BLM letters documenting UEI right of entry pending the outcome of pending litigation. December 26, 2000 and January 5, 2001
 - Letter documenting assignments of leases from Intermountain Power Agency to UtahAmerican Energy, Inc. September 7, 2000
 - BLM letters documenting R2P2 approval, November 5, 1999 and March 2, 2000
 - BLM Right-of-Way document, July 27, 2001
 - Surety Bond issued by XL Specialty Company, Bond # SB9905586 in the amount of \$1,556,000 and surety bond issued by Lincoln General Insurance Company, Bond # SUR004892 in the amount of \$1,253,000.
 - Lila Canyon Project Environmental Assessment UT-070-99-22

ADMINISTRATIVE OVERVIEW

UtahAmerican Energy, Inc.
HORSE CANYON MINE
C/007/013
Lila Canyon RevisionExtension

~~July 27~~ January 9, 200+2

Background

The Horse Canyon Mine is an inactive underground coal mine located in Emery and Carbon Counties, Utah on the east side of the Price River drainage basin at the western edge of the Book Cliffs. The mine was initially opened by the Defense Plant Corporation in 1942 as the source of metallurgical grade coal for the Geneva Steel Works in Orem, Utah. The mine was sold to U.S. Steel in 1946, who operated the mine until January 1984, when all mining was suspended. On November 11, 1984, Kaiser Steel Corporation purchased the Horse Canyon Mine property from U. S. Steel, and indicated that it would maintain the operations in a temporary suspension status pending further corporate decisions as to the future of the facilities. However, Kaiser Coal (successor in interest to Kaiser Steel) soon filed a petition for bankruptcy under Chapter 11.

On April 5, 1990 Intermountain Power Agency (IPA) acquired the Horse Canyon Mine and soon applied for a transfer of Kaiser Coal's permit rights. The Division approved the transfer to IPA on August 10, 1990. During the next several years IPA maintained the site and did complete reclamation of a large portion of the surface facilities area, but did not mine coal.

During 1998 plans for permitting the Lila Canyon Mine were being formulated by a company known as Basic Management LLC and were first submitted to the Division on September 8, 1998. The plan was later returned as incomplete. On December 21, 1998, UtahAmerican Energy, Inc. (UEI) acquired the Horse Canyon Mine when the IPA permit was transferred to them. UEI immediately began pursuing the application to permit the Lila Canyon leases and mine facilities as a **revisionn extension** to the Horse Canyon Mine.

Description of the Proposal

UtahAmerican Energy, Inc.(UEI) has proposed to develop new surface facilities near the mouth of Lila Canyon to mine coal in six federal leases. The application was submitted and reviewed as a **significant revisionchange (extension)** to the existing Horse Canyon Mine Mining and Reclamation Plan(MRP). The leases are contained within the "North Block Logical Mining Unit" as approved by the United States Bureau of Land Management (BLM) January 1, 1994. The current permit area (Horse Canyon) contains 1327.75 acres, and the Lila Canyon addition contains 4704.32 acres for a total of 6032.07 acres. The application contains plans for new surface facilities at the mouth of Lila Canyon which would be accessed by an upgraded county road. The current disturbed area is about 74.26 acres, and 28.11 acres would be disturbed by the new surface facilities. Mining will be done in the lower Sunnyside seam using longwall methods

with continuous miner development. Production is anticipated to average 1.5 million tons per year but could go as high as 4.5 million tons per year.

The Division first received this **significant revision application for a permit** on September 8, 1998, and after receiving additional information, the Division determined the application to be administratively complete on February 25, 1999. Various submittals were made through April 30, 2001 to correct technical deficiencies and the plan is now considered to be technically adequate as well.

The Division received a letter from a landowner, Mr. Josiah Eardley, on March 30, 1999 in response to the public notice published in the Sun Advocate. He pointed out his interest in water rights he owns adjacent to the minesite. The Division gave information to this land owner and provided him an opportunity to request an informal conference. There were no requests for an informal conference. During December 2000 and January 2001 the Division also received a number of letters from concerned citizens asking that the Lila Canyon mine not be permitted. While these letters were received outside of the public comment period the comments were considered while completing the technical analysis. It has been determined that the proposed Mining and Reclamation Plan conforms to the requirements of the Surface Mining Control and Reclamation Act and is adequate to protect the Lila Canyon area from adverse impacts caused by the mine.

A portion of the Turtle Canyon Wilderness Study Area is contained in the proposed addition to the permit area, and it also includes two Wilderness Inventory Units identified by the BLM as having wilderness characteristics. The application includes comments from the BLM about their management plans, and these plans are consistent with the mine plan.

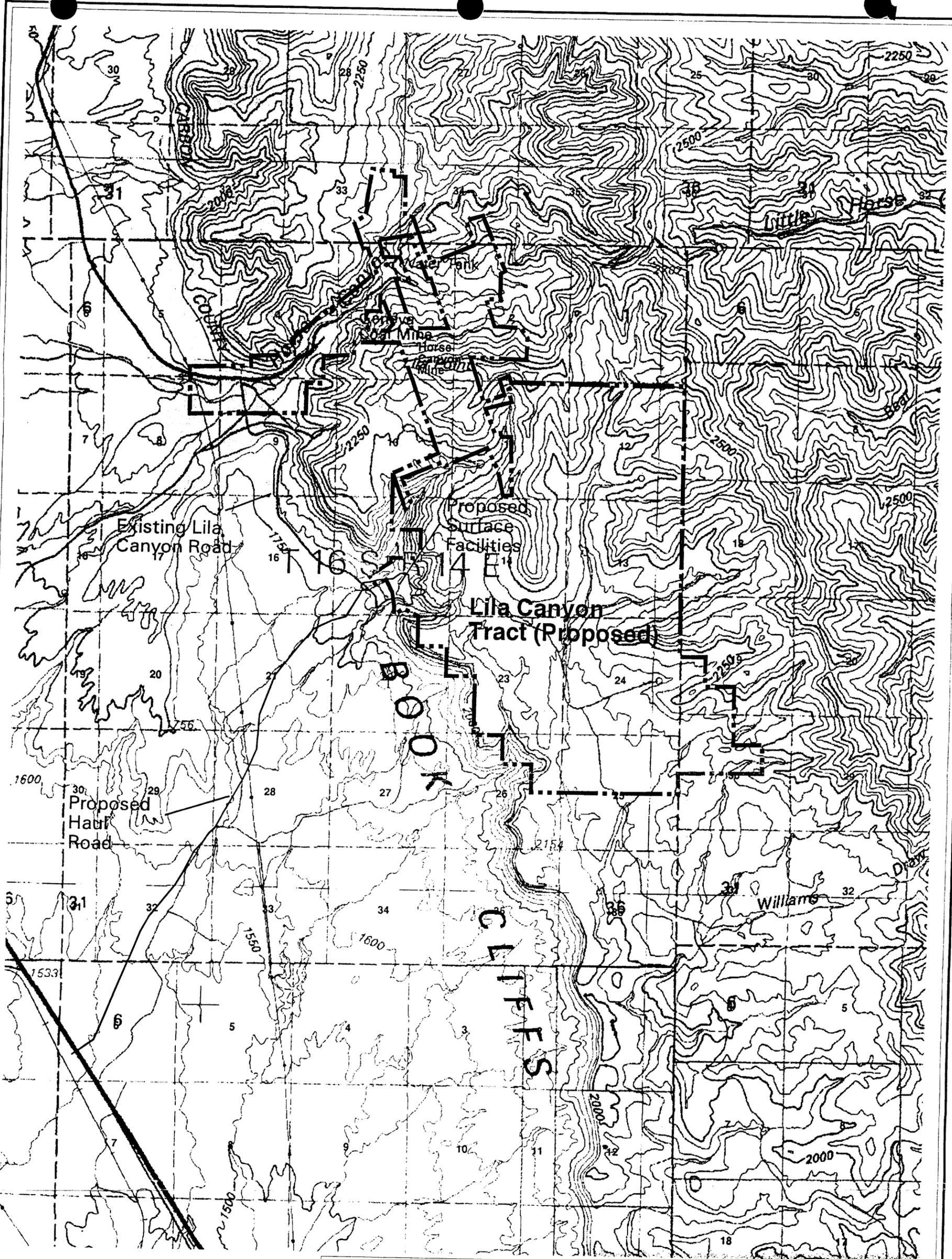
The original Section 7 consultation with the Fish and Wildlife Service (letter dated April 28, 2000) stated that no species-specific protective measures are considered necessary for the project, however recent correspondence (letter dated July 18, 2001) identified the possibility of spotted owl habitat within the permit area. To protect the spotted owl a stipulation will be added to the permit.

Recommendation for Approval

This recommendation for approval is based on the complete permit application package (PAP), the Technical Analysis (TA) conducted by the Division, the Cumulative Hydrologic Impact Assessment CHIA also prepared by the Division, the Lila Canyon Environmental Assessment prepared by the BLM, the approval of the R2P2 by the BLM, and the administrative record. UtahAmerican Energy, Inc. has demonstrated that mining within the permit boundary can be done in conformance with the Surface Mining Control and Reclamation Act, and the corresponding Utah Act and performance standards. The 510 (c) report on the Applicant Violator System for this mine has an issue recommendation. The Applicant has posted a reclamation bond in the amount of \$2,809,000.

It is recommended that approval be given for the Lila Canyon ~~revision~~extension to the Horse Canyon Mine permit with the following stipulations.

1. UtahAmerican Energy, Inc (UEI) will submit water quality data for the Horse Canyon Mine, beginning with data for the second quarter of 2001, in an electronic format through the Electronic Data Input web site, <http://hlunix.hl.state.ut.us/cgi-bin/appx-ogm.cgi>.
2. UEI may not commence underground coal mining and reclamation activities in federal coal leases until approval of the mining plan is authorized by the Secretary of the Interior.
3. UEI must have a qualified person make a determination as to whether Permit Area "B" contains suitable habitat for the Mexican spotted owl prior to any surface disturbing activities. Following completion of the field evaluation for suitable habitat, UEI will modify the MRP, as necessary, to comply with the requirements of the U. S. Fish and Wildlife Service.
4. UEI must notify the Division of the resolution of the Belmont Coal Company violation (OH D1020 in AVS) within 15 days of its resolution.



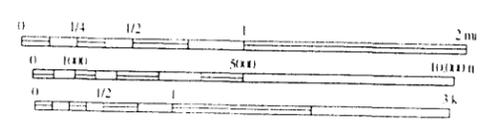
— Permit Area

General Location Map
Lila Canyon Tract (Proposed)

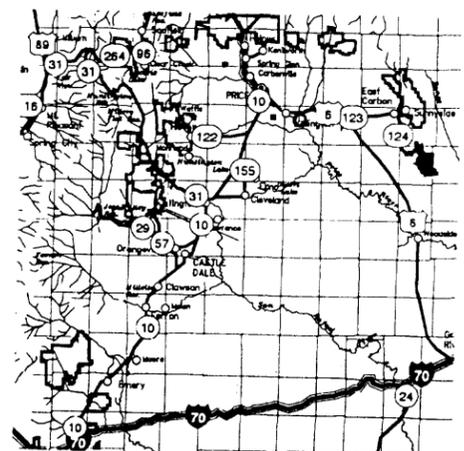
LOCATION MAP

File: lila.gra

Compiled by: Dan Smith Date: June 12, 2001



Scale 1:50000 (verity scale)



Location Map

 State of Utah
Department of Natural Resources
Division of Oil, Gas and Mining



PERMITTING CHRONOLOGY

UtahAmerican Energy, Inc.
HORSE CANYON MINE
C/007/013
Lila Canyon **Revision** **Extension**

~~July 27~~ January 9, 2001²

- | | |
|---------------------------|---|
| July 1998 | Division holds preliminary discussions and meets at the site with Jay Marshall of Basic Management LLC regarding permitting the Lila Canyon Mine. |
| September 8, 1998 | Basic Management, LLC's original Permit Application Package (PAP) received at the Division office. Intermountain Power Agency is the Permittee. |
| November 6, 1998 | PAP determined to be Administratively incomplete, PAP returned. |
| December 14, 1998 | Resubmittal of a revised Permit Application Package. |
| December 21, 2001 | The Horse Canyon Mine Permit is transferred from Intermountain Power Agency (IPA) to UtahAmerican Energy Inc. (UEI) |
| February 1, 1999 | The Division determines the PAP to be Administratively incomplete a second time. |
| February 11, 1999 | UEI submits additional information relative to deficiencies identified in the Administrative completeness review. |
| February 25, 1999 | The Division determines the Lila Canyon significant revision extension to the Horse Canyon Mine plan to be Administratively Complete. |
| March 4, 11, 18, 25, 1999 | Notice of a complete application is published in the <u>Price Sun Advocate</u> . |
| March 9, 16, 23, 30 1999 | Notice of a complete application is published in the <u>Emery County Progress</u> . |
| March 30, 1999 | The Division received comments from Josiah K. Eardley, a surface land owner, concerning potential for water loss. |

April 7, 1999 The Division responds in writing to Mr. Eardley's letter and provides an opportunity for an informal conference. No further comment or request for the conference was received.

May 26, 1999 The Division completes the 1st round Technical Analysis and identifies deficiencies that will need to be corrected.

July 30, 1999 UEI submits additional information intended to correct the technical deficiencies.

October 18, 1999 The Division completes the 2nd round - Technical Analysis and identifies deficiencies that will need to be corrected.

November 29, 1999 UEI submits additional information intended to correct the technical deficiencies.

February 23, 2000 The Division completes the 3rd round - Technical Analysis and identifies deficiencies that will need to be corrected.

March 10, 2000 UEI submits additional information intended to correct the technical deficiencies.

June 29, 2000 The Division completes the 4nd round - Technical Analysis and identifies deficiencies that will need to be corrected.

September 25, 2000 UEI submits additional information intended to correct the technical deficiencies.

November 20, 2000 The Division completes the 5nd round - Technical Analysis and identifies deficiencies that will need to be corrected.

January 19, 2001 UEI submits additional information intended to correct the technical deficiencies.

March 9, 2001 The Division completes the 6th round Technical Analysis and identifies deficiencies that will need to be corrected.

April 30, 2001 UEI submits additional information intended to correct the technical deficiencies.

May 7 thru July 13, 2001 UEI makes 10 different submittals (text changes and data updates) to correct minor discrepancies and to bring the plan up to date.

July 19, 2001 The Division completes the Technical Analysis and Cumulative Hydrologic Impact Assessment.

July 25, 2001 UEI posts required reclamation bond.

July 26, 2001 AVS check completed with issue recommendation.

July 27, 2001 The Division's Decision Document is completed and application is approved. Permit is issued with stipulations.

September 4, 2001 The Southern Utah Wilderness Alliance files a request for agency action and request for a hearing before the Board of Oil, Gas & Mining.

October 24, 2001 Board hearing is held to set the ground rules for the December hearing.

December 4, 2001 A hearing is held before the Board of Oil, Gas & Mining.

December 14, 2001 The Board issues an order which reverses the Division's decision and denies the permit.

January 9, 2002 The Division responds to the Board Order and issues a revised decision document and technical analysis.

MINING PLAN INFORMATION

Mine Horse Canyon Mine County: Carbon & Emery
 Permit ID C/007/013 (New Revision) Project ID SR98-1RBO
 Permittee UtahAmerican Energy, Inc.
 Address P.O. Box 187, Saint Clairsville, Ohio 43950-0187 Phone: (740) 926-1351
 Official & Title Clyde Borrell, Vice President
 Resident Agent Melvin Coonrod, Environmental Industrial Services
 Address 31 North Main Street, Helper, Utah 84526 Phone: (435) 472-3814

Proposed Operations

Federal Lease(s) SL-066145, SL-066490, U-014218, U-0126947, SL-069291, U-014217

(Surface U/G Mining Method(s) Longwall with Room & Pillar development

Coal Seam(s) to be Mined:

<u>Seam Name</u>	<u>Coal Thickness(es)</u>		<u>Seam Depth</u>
<u>Lower Sunnyside</u>	<u>4 to 18 feet</u>		<u>500 to 2500 feet</u>

<u>Surface Ownership</u> (Acres)	<u>Existing Permitted Area</u>	<u>Proposed Permitted Area</u>	<u>Total Mine Permitted Area</u>
Federal	170.01	4126.36	4296.37
State	248.3	40.76	289.06
Private	909.44	537.20	1446.64
TOTAL Acres	1327.75	4704.32	6032.07

Coal Ownership (Acres)			
Federal Lease(s)	499.61	4626.06	5125.67
Unleased Federal (ROW)	0	77.5	77.5
State	248.30	.76	249.06
Private	579.84	0.0	579.84
TOTAL Acres	1327.75	4704.32	6032.07

Surface Facilities Acres	<u>74.26 (Horse Cyn)</u>	<u>48.23</u>	<u>122.49</u>
Disturbed Acres (Actual)	<u>74.26 (Horse Cyn)</u>	<u>28.11</u>	<u>102.37</u>

Mineable Coal (Tons)			
Federal	0	94,300,000	94,300,000
Non-Federal	0	0	0
TOTAL Tons	0	94,300,000	94,300,000

	<u>Existing Permitted Area</u>	<u>Proposed Permitted Area</u>	<u>Total Mine Permitted Area</u>
Recoverable Coal			
Federal	0	27,200,000	27,200,000
Non-Federal	0	0	0
TOTAL Tons	0	27,200,000	27,200,000

Ave Annual Production: 1,500,000 tons

Maximum Annual Production: 4,500,000 tons

Year Mining Ends ≈2016

Federal

FINDINGS

UtahAmerican Energy, Inc.
HORSE CANYON MINE
C/007/013

Lila Canyon RevisionExtension
~~July 27~~January 9, 2001~~2~~

1. All procedures for public participation required by the Act, and the approved Utah State Program have been complied with. See Affidavit of Publication in Appendix 1-5 of PAP. (R645-300-120)
2. The permit application for the extraction of coal from federal leases SL-066145, SL-066490, U-014218, U-0126947, SL-069291, U-014217 using new surface facilities at Lila Canyon is accurate and complete and all requirements of the Surface Mining Control and Reclamation Act, and the approved Utah State Program (the "Act") have been complied with. See Technical Analysis dated ~~July 19~~January 9, 2001~~2~~ (R645-300-133.100)
3. The proposed lands to be included within the permit area are:
 - a. Not included within an area designated unsuitable for underground coal mining operations (R645-300-133.220); A small portion of the proposed permit area addition overlaps with the Turtle Canyon Wilderness Study Area. The BLM's 1993 Environmental Assessment (EA) prepared for management of the Turtle Canyon Wilderness Study Area, states that underground mining would be acceptable in this area. Also see TA dated ~~July 19~~January 9, 2001~~2~~.
 - b. not within an area under study for designated land unsuitable for underground coal mining operations (R645-300-133.210); The BLM's 1999 Utah Wilderness Inventory identifies the Desolation Canyon Wilderness Inventory Unit and the Turtle Canyon Inventory Unit as having wilderness characteristics, however, the BLM plan for this area has not changed to date. See TA dated ~~July 19~~January 9, 2001~~2~~.
 - c. not on any lands subject to the prohibitions or limitation of 30 CFR 761.11 {a} (national parks, etc), 761.11 {f} (public buildings, etc.) and 761.11 {g} (cemeteries);
 - d. not within 100 feet of a public road except where the Lila Canyon road abuts the surface facilities area of the proposed mine In this case the permittee has obtained permission from the road authority for conducting mining activity within 100 feet of the road. (R645-300-133.220) See July 18, 2001 Analysis and Findings on the Lila Canyon Road; and
 - e. not within 300 feet of any occupied dwelling (R645-300-133.220).

4. The applicant has the legal right to enter and complete mining activities in the Lila Canyon area through the federal coal leases and a right-of way issued by the Bureau of Land Management. (See September 7, 2001 letter to Lowell Braxton verifying that the leases are assigned to UEI and ROW dated July 27, 2001). (R645-300-133.300)
5. An assessment of the probable cumulative impacts of all anticipated coal mining and reclamation activities in the general area on the hydrologic balance has been conducted by the Division and no significant impacts were identified. See CHIA dated July 19, 2001. The Mining and Reclamation Plan (MRP) proposed under the revised application has been designed to prevent damage to the hydrologic balance in the permit area and in associated off-site areas. (R645-300-133.400 and UCA 40-10-11 (2)(c))
6. The operation would not affect the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitats as determined under the Endangered Species Act of 1973. The original Section 7 consultation with the Fish and Wildlife Service (letter dated April 28 2000) stated that no species-specific protective measures are considered necessary for the project, however recent correspondence (letter dated July 18, 2001) identified the possibility of spotted owl habitat within the permit area. To protect the spotted owl the following stipulation has been added to the permit: Prior to any surface disturbing activities, the Permittee must have a qualified person determine whether the proposed addition to the permit area contains suitable habitat for the Mexican spotted owl. Depending on the results of this evaluation, the Permittee will modify the mining and reclamation plan in accordance with requirements of the USFWS. An alternative to this action is to limit all coal mining and reclamation activities to time periods outside the breeding season, March 1 to August 31. (16 USC 1531 et seq.) (R645-300-133.500)
7. The Division's issuance of a permit is in compliance with the National Historic Preservation Act and implementing regulations (36 CFR 800). See Technical Analysis dated ~~July 19~~ ~~January 9, 2001~~ ~~2~~. (R645-300-133.600)
8. The applicant proposes acceptable practices for the reclamation of disturbed lands. The Division has determined that reclamation, as required by the Act can be feasibly accomplished following the approved plan as outlined in the PAP. See Technical Analysis dated ~~July 19~~ ~~January 9, 2001~~ ~~2~~. (R645-300-133.710)
9. The applicant has demonstrated that all mine facilities and structures will comply with the applicable performance standards of R645-301. No special categories of mining are proposed so the R645-302 regulations do not apply. The Lila Canyon facilities will be newly constructed and will not utilize any existing structures. (R645-300-133.720, R645-300-133.740)
10. A 510 (c) report has been run on the Applicant Violator System (AVS), which shows that: prior violations of applicable laws and regulations have been corrected; neither Utah American Energy, Inc. or any affiliated company, are delinquent in payment of fees for the Abandoned Mine Reclamation Fund; and the applicant does not control and has not controlled mining operations with demonstrated pattern of willful violations of the Act of such nature, duration, and with such resulting irreparable damage to the environment as to indicate an intent not to

comply with the provisions of the Act. (See 510 (c) report dated ~~July 26~~January 9, 20012) (R645-300-133.730)

11. The proposed postmining land-use of the permit area will remain the same as the pre-mining land use.(R645-300-133.750)
12. The applicant has posted a surety bond for the Horse Canyon Mine which includes the Lila Canyon facilities in the amount of \$2,809,000, payable to the Office of Surface Mining as well as the Utah Division of Oil Gas and Mining. (R645-300-134)
13. No lands designated as prime farmlands or alluvial valley floors occur on the permit area. See ~~July 19~~January 9, 20012 Technical Analysis (R645-302-313.100 and R645-302-321.100)
14. The Division has made all specific approvals required by the Act, the Cooperative Agreement, and the Federal Lands Program.

Permit Supervisor

Permit Supervisor

Associate Director of Mining

Director

FEDERAL

C/007/013
(Revised)(Reissued)

July 27, 2001
(January 9, 2002)

STATE OF UTAH
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING
1594 West North Temple, Suite 1210
Salt Lake City, Utah 84114-5801
(801) 538-5340

This permit, C/007/013, is issued for the state of Utah by the Utah Division of Oil, Gas and Mining (Division) to:

UtahAmerican Energy, Inc. (UEI)
PO Box 187
Saint Clairsville, Ohio 43950-0187

for the Horse Canyon Mine. A Surety Bond is filed with the Division in the amount of \$2,809,000 payable to the State of Utah, Division of Oil, Gas and Mining and the United States Department of Interior, Office of Surface Mining Reclamation and Enforcement (OSM). The Division must receive a copy of this permit signed and dated by the UEI.

- 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 coal mining and reclamation operations on the following described lands within the permit area at the Horse Canyon Mine, situated in the state of Utah, Carbon and Emery Counties, and located in the following described areas:

Permit Area "A"

Beginning at the SW corner of the SE1/4 SE1/4 of Section 5, T16S, R14E, SLBM; and running thence North 660 feet; thence East 2640 feet; thence North 660 feet; thence East 1980 feet; thence North 660 feet; thence approximately N 45° East 4800 feet, more or less; thence approximately N 70° W 1250 feet more or less; thence West 250 feet; thence approximately N 28° W 1320 feet more or less; thence approximately N 65° E 580 feet more or less; thence approximately N 13° E 600 feet more or less; thence approximately N 82° W 100 feet more or less; thence approximately N 10° E 1650 feet more or less; thence approximately S 88° E 1030 feet more or less; thence South 260 feet; thence approximately S 88° E 550 feet more or less; thence approximately S 09° W 1940 feet more or less; thence East 300 feet; thence approximately S 20° E 1550 feet more or less; thence approximately N 68° E

100 feet more or less; thence approximately S 20° E 250 feet more or less; then approximately N 20° W 1120 feet more or less; N 68° E 2170 feet more or less; thence approximately N 20° W 1120 feet more or less; thence approximately N 68° E 600 feet more or less; thence East 200 feet; then approximately S 20° E 2800 feet more or less; thence approximately S 68° W 300 feet more or less; thence South 500 feet; thence West 1200 feet; thence South 300 feet; thence East 450 feet; thence South 380 feet; thence West 400 feet; thence approximately S 22° E 1310 feet more or less; thence East 1240 feet; thence approximately S 45° E 660 feet more or less; thence South 1000 feet; thence West 2650 feet; thence approximately S 22° E 2140 feet more or less; thence approximately N 68° E 1010 feet more or less; thence approximately N 22° W 700 feet more or less; thence approximately N 68° E 540 feet more or less; thence approximately S 22° E 500 feet more or less; thence approximately S 63° W 300 feet more or less; thence approximately S 22° E 600 feet more or less; thence approximately S 68° W 400 feet more or less; thence approximately N 22° W 110 feet more or less; thence approximately S 68° W 850 feet more or less; thence approximately S 22° E 1150 feet more or less; thence approximately S 89° E 350 feet more or less; thence South 100 feet; thence East 450 feet; thence South 2600 feet; thence approximately S 77° W 300 feet more or less; thence approximately N 2° W 1270 feet more or less; thence approximately N 22° W 1120 feet more or less; thence approximately S 68° W 2150 feet more or less; thence approximately N 22° W 200 feet more or less; approximately S 68° W 1950 feet more or less; thence approximately S 22° E 650 feet more or less; thence approximately S 8° W 560 feet more or less; thence approximately S 68° W 50 feet more or less; thence approximately N 22° W 1480 feet more or less; thence approximately N 68° E 2250 feet more or less; thence approximately N 22° W 5410 feet more or less; thence West 2000 feet; thence South 520 feet; thence West 1350 feet; thence South 1320 feet; thence West 660 feet to the NW corner of the NE1/4 NE1/4 of Section 9, T16S, R14E, SLBM; thence South 1320 feet; West 5280 feet; North 1320 feet to the point of beginning.

Less the following portions thereof:

- (a) Beginning approximately 700 feet South from the NW corner of Lot 11, Section 3, T16S, R14E, SLBM; thence East 700 feet; thence North 800 feet; thence approximately S 22° E 1600 feet more or less; thence approximately S 48° W 300 feet more or less; thence West 870 feet; thence approximately N 22° W 300 feet more or less; thence North 650 feet more or less to the point of beginning.
- (b) Beginning 590 feet North of the center of Section 3, T16S, R14E, SLBM; thence North 1120 feet more or less; thence W 750 feet; thence approximately N 22° W 660 feet more or less; thence approximately N 75° E 1460 feet more or less; thence approximately S 22° E 2080 feet more or less; thence

approximately S 75° E 100 feet more or less; thence approximately S 22° E 2500 feet more or less; thence West 1730 feet; thence approximately N 22° W 2320 feet more or less; thence East 300 feet more or less to the point of beginning.

- (c) Beginning 350 feet East of the NW corner of Section 11, T16S, R14E, SLBM; thence S 22° E 2720 feet more or less; thence approximately S 68° W 1650 feet more or less; thence approximately N 22° W 4800 feet more or less; thence approximately N 10° E 500 feet more or less; thence East 1400 feet more or less; thence approximately S 22° E 2020 feet more or less to the point of beginning.

Emery County Road to be Excluded:

A strip of land, 100.00 feet wide, 50.00 feet on each side of the centerline of the Emery County roads within the above described permit boundary.

Permit Area "B"

T16S R14E

Section 10:	Portions of SE1/4
Section 11	E1/2 Portions of W1/2
Section 12	All
Section 13	All
Section 14	All
Section 15	Portions of E1/2 SW1/4
Section 22	NE1/4NE1/4
Section 23	N1/2 SE1/4 E1/2SW1/4
Section 24	All
Section 25	N1/2
Section 26	N1/2NE1/4 SE1/4NE1/4

T16S R15E

Section 19:	W1/2SW1/4 SE1/4SW1/4 S1/4NE1/4SW1/4
Section 30:	NW1/4 SW1/4NE1/4 S1/4NW1/4NE1/4

This legal description is for the permit area identified on Plate 1-1 of the Mining and Reclamation Plan (MRP) of the Horse Canyon Mine. The permittee is authorized to conduct coal mining and reclamation operations 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 is effective on July 27, 2001 and expires on May 6, 2006.
- Sec. 5 ASSIGNMENT OF PERMIT RIGHTS** - The permit rights may not be transferred, assigned or sold without the approval of the Division Director. 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 coal mining and reclamation operations in accordance with the approved MRP and 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

THE STATE OF UTAH

By: _____

Date: _____

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

Authorized Representative of Permittee

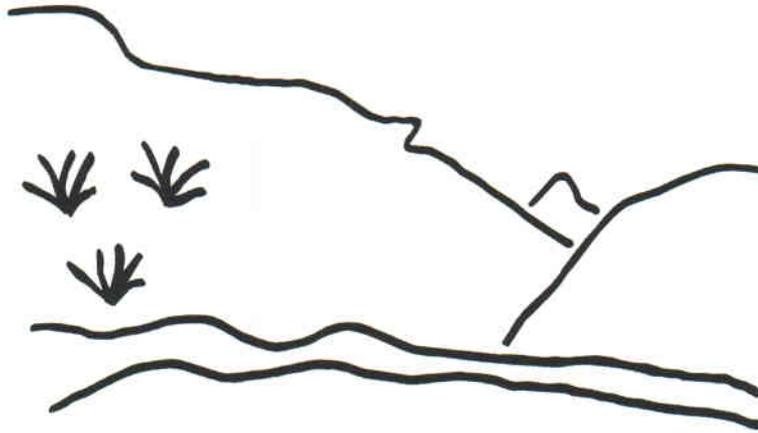
Date: _____

Attachment A

SPECIAL CONDITIONS

1. UtahAmerican Energy, Inc (UEI) will submit water quality data for the Horse Canyon Mine, beginning with data for the second quarter of 2001, in an electronic format through the Electronic Data Input web site, <http://hlunix.hl.state.ut.us/cgi-bin/appx-ogm.cgi>.
2. UEI may not commence underground coal mining and reclamation activities in federal coal leases until approval of the mining plan is authorized by the Secretary of the Interior.
3. UEI must have a qualified person make a determination as to whether Permit Area "B" contains suitable habitat for the Mexican spotted owl prior to any surface disturbing activities. Following completion of the field evaluation for suitable habitat, UEI will modify the MRP, as necessary, to comply with the requirements of the U. S. Fish and Wildlife Service.
4. UEI must notify the Division of the resolution of the Belmont Coal Company violation (OH D1020 in AVS) within 15 days of its resolution.

State of Utah



Utah Oil Gas and Mining

Coal Regulatory Program

This Document contains the majority of required "findings" under the coal rules. The remainder of the required "findings" are located at the start of the Decision Document.

Horse Canyon Mine
Lila Canyon ~~Significant Revision~~ Permit Extension to Horse Canyon
C/007/013-SR98(1)-6 RBO
Technical Analysis - Response to Board Order
~~July 19, 2001~~ January 9, 2002
P:\GROUPS\COAL\WP\007013.HOR\DRAFT\DEADLINE\TA_RBO.wpd



TABLE OF CONTENTS

ACRONYMS	8
INTRODUCTION	1
SUMMARY OF PERMIT CONDITIONS	3
GENERAL CONTENTS	5
OWNERSHIP AND CONTROL INFORMATION	5
VIOLATION INFORMATION	6
RIGHT OF ENTRY	8
LEGAL DESCRIPTION AND STATUS OF UNSUITABILITY CLAIMS	9
PERMIT TERM	10
PUBLIC NOTICE AND COMMENT	11
FILING FEE	12
ENVIRONMENTAL RESOURCE INFORMATION	13
GENERAL	13
PERMIT AREA	13
HISTORIC AND ARCHEOLOGICAL RESOURCE INFORMATION	14
CLIMATOLOGICAL RESOURCE INFORMATION	14
VEGETATION RESOURCE INFORMATION	15
FISH AND WILDLIFE RESOURCE INFORMATION	17
Wildlife Information	19
Threatened and Endangered Species	20
SOILS RESOURCE INFORMATION	23
Substitute Topsoil	26
LAND-USE RESOURCE INFORMATION	26
ALLUVIAL VALLEY FLOORS	28
Alluvial	29
PRIME FARMLAND	31
GEOLOGIC RESOURCE INFORMATION	32
HYDROLOGIC RESOURCE INFORMATION	38
Sampling and analysis	39
Baseline Information	40
Ground-water Information	41
Surface-Water Information	52
Baseline Cumulative Impact Area Information	57
Modeling	58
Alternative Water Source Information	58
Probable Hydrologic Consequences (PHC) Determination	58
MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION	61
Affected Area Boundary Maps	62

TABLE OF CONTENTS

Archeological Site and Cultural Resource Maps	63
Coal Resource and Geologic Information Maps	63
Existing Structures and Facilities Maps	63
Existing Surface Configuration Maps	64
Mine Workings Maps	64
Monitoring Sampling Location Maps	64
Permit Area Boundary Maps	64
Surface and Subsurface Ownership Maps	65
Subsurface Water Resource Maps	65
Surface Water Resource Maps	66
Vegetation Reference Area Maps	66
Well Maps	66
Contour Maps	66
MINING OPERATIONS AND FACILITIES	69
Type and Method of Mining Operations	69
Facilities and Structures	70
EXISTING STRUCTURES	71
PROTECTION OF PUBLIC PARKS AND HISTORIC PLACES	72
RELOCATION OR USE OF PUBLIC ROADS	73
AIR POLLUTION CONTROL PLAN	74
COAL RECOVERY	74
SUBSIDENCE CONTROL PLAN	75
Renewable Resources Survey	76
Subsidence Control Plan	77
Performance Standards for Subsidence Control	79
Notification	79
SLIDES AND OTHER DAMAGE	79
FISH AND WILDLIFE INFORMATION	80
Protection and Enhancement Plan	80
Endangered and Threatened Species and Bald and Golden Eagles	82
Wetlands and Habitats of Unusually High Value for Fish and Wildlife	83
TOPSOIL AND SUBSOIL	83
Topsoil and Subsoil Removal	84
Topsoil Substitutes and Supplements	89
Topsoil Storage	90
VEGETATION	90
ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES	91
Road Systems	92
Performance Standards	93
Primary Road Certification	93
Other Transportation Facilities	94
SPOIL AND WASTE MATERIALS	94
Disposal of Noncoal Mine Waste	99
Coal Mine Waste	99
Refuse Piles	100

TABLE OF CONTENTS

Impounding Structures	103
Burning and Burned Waste Utilization	103
Return of Coal Processing Waste to Abandoned Underground Workings	103
Excess Spoil	104
HYDROLOGIC INFORMATION	104
Ground-water Monitoring	111
Surface-water Monitoring	113
Acid and Toxic-forming Materials	115
Transfer of Wells	116
Discharges Into an Underground Mine	116
Gravity discharges from underground mines.	117
Water Quality Standards and Effluent Limitations	117
Casing and Sealing of Wells	118
Diversions	118
Stream Buffer Zones	119
Sediment Control Measures	120
Siltation Structures	121
Sedimentation Ponds	121
Other Treatment Facilities	122
Exemptions for Siltation Structures	122
Discharge Structures	122
Impoundments	122
Casing and Sealing of Wells	123
SUPPORT FACILITIES AND UTILITY INSTALLATIONS	123
SIGNS AND MARKERS	125
USE OF EXPLOSIVES	126
MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS	128
Affected Area Maps	129
Mining Facilities Maps	129
Mine Workings Maps	129
Monitoring and Sample Location Maps	130
Certification Requirements	130
RECLAMATION PLAN	131
GENERAL REQUIREMENTS	131
POSTMINING LAND USES	131
PROTECTION OF FISH, WILDLIFE, AND RELATED ENVIRONMENTAL VALUES	133
APPROXIMATE ORIGINAL CONTOUR RESTORATION	134
BACKFILLING AND GRADING	137
Previously Mined Areas	141
Backfilling and Grading on Steep Slopes	141
MINE OPENINGS	141
TOPSOIL AND SUBSOIL	142
Soil Redistribution	143

TABLE OF CONTENTS

Soil Replacement Depths and Volumes	144
Soil Nutrients and Amendments	144
Soil Stabilization	144
ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES	145
HYDROLOGIC INFORMATION	145
Ground-water Monitoring	146
Surface-water Monitoring	146
Acid and Toxic-forming Materials	146
Transfer of Wells	147
Discharges Into an Underground Mine	147
Gravity Discharges	147
Water Quality Standards and Effluent Limitations	148
Diversions	148
Stream Buffer Zones	148
Sediment Control Measures	149
Siltation Structures	149
Sedimentation Ponds	149
Discharge Structures	149
Impoundments	149
Casing and Sealing of Wells	149
CONTEMPORANEOUS RECLAMATION	150
REVEGETATION	152
Revegetation Plan	153
Success Standards	155
Field Trials	156
STABILIZATION OF SURFACE AREAS	157
CESSATION OF OPERATIONS	158
MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS ..	158
Affected Area Boundary Maps	160
Bonded Area Map	160
Reclamation Backfilling and Grading Maps	160
Reclamation Facilities Maps	160
Final Surface Configuration Maps	160
Reclamation Surface and Subsurface Manmade Features Maps	160
Certification Requirements	161
BONDING AND INSURANCE REQUIREMENTS	161
Form of Bond (Reclamation Agreement)	162
Determination of Bond Amount	162
Terms and Conditions for Liability Insurance	162

REQUIREMENTS FOR PERMITS FOR SPECIAL

CATEGORIES OF MINING	165
PRIME FARMLAND	165
OPERATIONS IN ALLUVIAL VALLEY FLOORS	165

TABLE OF CONTENTS

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT
..... 167

ACRONYMS

ACRONYMS

AOC.....Approximate Original Contours
BLM.....United States Bureau of Land Management
CHIA.....Cumulative Hydrologic Impact Assessment
DEQ.....Department of Environmental Quality
Division.....Utah Division of Oil, Gas and Mining
DOG M.....Utah Division of Oil, Gas and Mining
EA.....Environmental Assessment
ECDC.....East Carbon Development Corporation
EIS.....Environmental Impact Statement
IPA.....Intermountain Power Agency
MDC.....Minerals Development Corporation
MRP.....Mining and Reclamation Plan
MSHA.....Mine Safety and Health Administration
NRCS.....Natural Resources Conservation Service
PHC.....Probable Hydrologic Consequences
R2P2.....Resource Recovery and Protection Plan
RCRA.....Resource Conservation and Recovery Act
SHPO.....State Historic Preservation Office
SITLA.....School and Institutional Trust Lands Administration
SMCRA.....Surface Mining Control and Reclamation Act
UDWQ.....Utah Division of Water Quality
UDWR.....Utah Division of Wildlife Resources
UEI.....Utah American Energy, Inc.
UPDES.....Utah Pollutant Discharge Elimination System
USGS.....United States Geological Survey
USFWS.....United States Fish and Wildlife Service

ACRONYMS

INTRODUCTION

INTRODUCTION

UtahAmerican Energy, Inc.(UEI) has proposed to develop new surface facilities near the mouth of Lila Canyon to mine coal in six federal leases. The application was submitted and reviewed as an ~~extension-significant revision~~ to the existing Horse Canyon Mine Mining and Reclamation Plan(MRP). The leases are contained within the "North Block Logical Mining Unit" as approved by the United States Bureau of Land Management (BLM) January 1, 1994. The current permit area contains 1327.75 acres, and the Lila Canyon addition contains 4704.32 acres for a total of 6032.07 acres. The current disturbed area is about 74.26 acres, and 28.11 acres would be disturbed by the new surface facilities.

The Division first received this ~~permit application significant revision~~ September 8, 1998, and after receiving additional information, the Division determined the application to be administratively complete on February 25, 1999. The Division received a letter from a landowner, Mr. Josiah Eardley, on March 30, 1999 in response to the public notice published in the Sun Advocate. He pointed out his interest in water rights he owns adjacent to the minesite. ~~Mr. Eardley asked the regulatory authority to ensure protection of water rights he owns in Sec. 11, T 16 S., T 14 E., near the proposed mine permit extension area.~~ The Division gave information to this land owner and provided him an opportunity to request an informal conference. There were no requests for an informal conference. ~~Mr. Eardley's water rights, as well as all water rights on the proposed permit area, were evaluated during the review process to ensure the utmost protection.~~

~~Mining has been conducted directly beneath or adjacent to springs H-18, H-18A, H-18B, H-19, H-21, H-21A, H-21B, H-22, and H-92 in the upper portion of Lila Canyon Wash. No more mining will be conducted to effect these springs (Plate 5-1, B# 005138, and Plate 7-1, B# 005659). The area already undermined includes water rights 91-617 and 91-618, totaling 0.22 cfs, in Sec. 11. These water rights are shown in Table 7-2 (B# 005355) as belonging to Mont Blackburn, but presumably these are the rights Mr. Eardley claims. Plate 5-3 (B3 005141) shows that the Lila Canyon Extension will not mine near any listed water rights in Sec. 11. All of the spring sources mentioned above flow down Lila Canyon Wash, no springs flow down Little Park Wash.~~

A portion of the Turtle Canyon Wilderness Study Area is contained in the proposed addition to the permit area, and it also includes two Wilderness Inventory Units identified by the BLM as having wilderness characteristics. The application includes comments from the BLM about their management plans, and these plans are consistent with the mine plan.

Through the course of several reviews, the plan has been modified to the point that the Division now finds it complete and accurate and in compliance with the Utah Coal Regulatory Program.

INTRODUCTION

On December 14, 2001 the Board of Oil, Gas and Mining remanded the Division's decision to issue the permit. This TA addresses all of the issues raised by the Board in its Order.

SUMMARY OF PERMIT CONDITIONS

SUMMARY OF PERMIT CONDITIONS

As determined in the analysis and findings of this Technical Analysis, approval of the plan is subject to the following Permit Conditions. The applicant is subject to compliance with the following Permit Conditions and has committed to comply with the requirements of these conditions as referenced in the approved Permit.

Accordingly, the permittee has committed to comply with the requirements of the following Permit Conditions, as specified, and in accordance with the requirements of:

Permit Conditions

UtahAmerican Energy Inc. (UEI) will submit water quality data for the Horse Canyon Mine, beginning with data for the second quarter of 2001, in an electronic format through the Electronic Data Input website, <http://hlunix.hl.state.ut.us/cgi-bin/appx-ogm.cgi>.

UEI may not commence underground coal mining and reclamation activities in federal coal leases until approval of the mining plan is authorized by the Secretary of the Interior.

UEI must have a qualified person make a determination as to whether Permit Area "B" contains suitable habitat for the Mexican spotted owl prior to any surface disturbing activities. Following completion of the field evaluation for suitable habitat, UEI will modify the MRP, as necessary, to comply with the requirements of the U. S. Fish and Wildlife Service.

UEI must notify the Division of the resolution of the Belmont Coal Company violation (OH D1020) in AVS) within 15 days of it resolution.

Page 4

C/007/013-~~SR98(1)-6~~ RBO

~~July 19, 2001~~ January 9, 2002

SUMMARY OF PERMIT CONDITIONS

GENERAL CONTENTS

GENERAL CONTENTS

OWNERSHIP AND CONTROL INFORMATION

Regulatory Reference: R645-301-112

Minimum Regulatory Requirements:

The operator of the coal mine and all owners and controllers of the operation must be identified by name and address. The Division with the Applicant/Violator System must crosscheck the information provided and other sources such as DOGM inspection and enforcement records, State corporation commission or tax records. If the Division identifies any errors in the ownership or control information, the applicant must be contacted to resolve the matter immediately. If the Division discovers that none of the persons identified in the application has had any previous mining experience, the applicant will be contacted to verify this fact.

The Applicant/Violator System will be updated with new information received by the Division.

Analysis:

The Permittee is UtahAmerican Energy, Inc.(UEI), a Utah corporation. The plan gives the name, address and telephone number of the Permittee and its resident agent and includes the employer identification number for the Permittee. UEI will pay the abandoned mine reclamation fees.

Section 112.300 of the plan says ownership and control information is in Appendix 1-1, and Appendix 1-1 references Appendix 1-7 of Part "A" of the Horse Canyon Mine MRP for ownership and control information. Section 112.340 says identifying information about affiliated coal mining and reclamation operations is in Appendix 1-2, and this appendix references Appendix 1-9 of Part "A" of the Horse Canyon Mine MRP for this information.

Most of this ownership and control information has been previously approved as part of the Horse Canyon Mine MRP. It is possible to determine the corporate structure. While there are several affiliated companies, UEI, is only owned by one company, Coal Resources, Inc.

The plan is required to include the names, addresses, permit numbers, regulatory authorities, employer identification numbers, and Mine Safety and Health Administration (MSHA) numbers together with dates of issuance for coal mining and reclamation operations owned or controlled by the Permittee or by any person that owns or controls the Permittee, and this information is in Appendix 1-9 of the Horse Canyon Mine MRP and Appendix 1-1 of the current plan for the Lila Canyon Mine. No permitted operations are shown for Coal Resources, Inc.; PennAmerican Coal, Inc.; AmCoal Holdings, Inc.; Mill Creek Mining Company; Pinski Corporation; American Coal Sales Company; West Virginia Resources, Inc.; Pennsylvania Transloading, Inc.; Sunburst Resources, Inc.; Ohio Valley Resources, Inc.; and Spring Church Coal Company. These companies do not have associated coal mining and reclamation operations.

Section 112.500 of the text and Plates 4-1 and 5-4 show surface and coal ownership in and contiguous to both the existing permit area and the proposed addition. Section 112.500 of the plan

includes the names and addresses of the surface and coal owners, and this information is consistent with the information on the plates.

The plan shows MSHA identification numbers for both the Horse Canyon and Lila Canyon Mines and for the refuse pile. An MSHA identification number is only required for the portion of the refuse pile that will hold coal processing waste whereas the definitions in R645-100 also include underground development waste as part of coal mine waste.

According to this section of the plan, there are no lands, interests in lands, options, or pending bids on interests held or made by the Permittee for lands contiguous to the proposed addition to the permit area. Plates 4-1 and 6-2 show federal leases to the south of the proposed addition to the permit area that are labeled "Potential Area of Future Mining."

On December 14, 2001, the Board of Oil, Gas and Mining remanded the Division's decision to issue the permit for the Lila Canyon Permit Application, but did not rule on whether or not the permit was improvidently issued. For clarification, UEI submitted a letter to the Division on January 9, 2002 stating that no change had occurred in the ownership and control information previously submitted under R645-301-112.100 through R645-301-112.800.

Findings:

All of the ownership and control information is current and correct. Information in the plan is adequate to meet the minimum ownership and control information requirements of the regulations.

VIOLATION INFORMATION

Regulatory Reference: R645-301-113

Minimum Regulatory Requirements:

The application must inform the Division of any of the following:

- (1) State or Federal permits suspension or revocation
- (2) Bond or other security forfeiture in the last five years;
- (3) Any State or Federal violations received in the last three years by the applicant or any subsidiary, affiliate, or persons controlled by or under common control with the applicant. All outstanding violations (regardless of date) must also be disclosed.

The Division will review all available information and will not issue a permit if any operation owned or controlled by the applicant or linked to the applicant is in violation of SMCRA or the State Program or any State or Federal environmental law.

The Division will notify the applicant of the violation, suspension or forfeiture hindering their current application for permit and give the applicant an opportunity to rebut the findings. The Division will keep the Applicant Violator System updated.

Analysis:

On December 14, 2001, the Board of Oil, Gas, and Mining remanded the Division's decision to issue the permit for the Lila Canyon Permit Application but did not rule on whether or not the permit was issued improvidently. The discussion below has been supplemented to clarify and explain

GENERAL CONTENTS

for the purposes of the Board Order why the permit can be issued in accordance with the rules.

According to the plan, neither UEI nor any subsidiary, affiliate, or persons controlled by or under common control with them has had a federal or state permit suspended or revoked in the past five years, and these same entities have not forfeited a performance bond or similar security.

Appendix 1-3 contains a list of violations received by affiliated companies for the past three years. ~~but Appendix 1-3 says these violations are listed in Appendix 1-8 of the Horse Canyon Mine MRP.~~ This appendix shows ~~There is~~ one apparent violation issued to Maple Creek Mining ~~that has yet to be terminated,~~ and, according to the plan, administrative proceedings are ongoing. The table submitted in the PAP was actually incorrect as explained here:

On December 3, 2001 having seen SUWA's pre-trial memorandum dated November 30, 2001; Pamela Grubaugh-Littig, Permit Supervisor in the Utah Coal Regulatory Program, contacted Chad Riddle, an Air Quality Specialist at the Pennsylvania Department of Environmental Protection, Bureau of Air Quality, (PA-BAQ) by telephone. Ms. Grubaugh-Littig asked Mr. Riddle about the Maple Creek Mining "ongoing" air-quality violation (SUWA exhibit 90). He said they had no record of issuing a violation to Maple Creek Mining on any of the dates specified in the plan. Mr. Riddle stated that an inspector may have seen violations on the dates listed, and rather than issuing written violations, the inspector noted the problems and worked with the operator to resolve them.

There are currently no outstanding air or water quality violations for the Permittee or affiliates. A letter from UEI on January 9, 2002 stated no change to the violation information.

The AVS system was queried on January 9, 2002 and one violation exists for an affiliate of UEI, Belmont Coal Company. Through information previously submitted, there is one outstanding violation that is under administrative remedy at Belmont Coal Company with the Ohio Division of Mineral Resources Management. This violation is coded "C", however, which is not a permit block, rather that the violation is in the process of being resolved. The permit has been conditioned to reflect that UEI must notify the Division within 15 days of the resolution of this issue.

The plan contains the required information to comply with R645-301-113. See the Division's decision document for the 510C (Applicant Violator System [AVS]) check.

AVS Check on July 26, 2001	AVS Check on January 9, 2002
----------------------------	------------------------------

Permit Issuance.	Code "C" (issue being resolved) for one violation with an affiliate, Belmont Coal Company. Permit conditioned, UEI must notify the Division within 15 days of the resolution of this violation. See AVS compliance memo dated January 9, 2002 in decision document.
------------------	---

Findings:

Information provided in the plan and additional information considered for this response to the Board Order is adequate to satisfy the violation information requirements of the regulations. The Permit has been conditioned to state that UEI must notify the Division within fifteen days of the resolution of the Belmont Coal Company violation situation.

RIGHT OF ENTRY

Regulatory Reference: R645-301-114

Minimum Regulatory Requirements:

Documents giving legal right to enter the permit area must be detailed in the application by date, type of document, land description and rights claimed. Any pending litigation over these legal rights must be disclosed.

The written consent of the landowner for the extraction of the coal by surface mining methods must also be included when the surface and mineral owners are different. Also a copy of the conveyance that grants the legal authority to extract the coal by surface methods will be included.

The Division does not have the authority to adjudicate property rights disputes.

Analysis:

UEI has right of entry to 5,544.01 acres of federal coal in six federal leases purchased in June 2000 from Intermountain Power Agency (IPA). The BLM has approved transfer of the federal leases from IPA to UEI. Table 4-2 of the plan contains complete acreage figures for federal, state, and private surface and mineral rights.

Parts of Sections 33 and 34, Township 15 South, Range 14 East, are in the current Horse Canyon permit area, and, according to Plate 5-4, they contain unleased federal coal. Therefore, while they may be considered part of the current permit area, the Permittee has no right to mine these areas.

The Permittee bases its legal right to enter and begin coal mining and reclamation operations in the surface facilities portion of the proposed addition to the permit area on two BLM letters, copies of which are contained in Appendix 1-6. The surface facilities would be built in Section 15 of Township 16 South, Range 14 East. The land is managed by the BLM, but it is not in the federal coal leases. The plan includes copies of letters from the BLM indicating they are prepared to grant

GENERAL CONTENTS

right of entry. Appendix 1-6 contains copies of these letters dated December 26, 2000, and January 4, 2001, from Tom Rasmussen of the BLM to Mary Ann Wright, the Division's Associate Director of Mining. This case is in litigation, and the BLM is waiting for a decision from the Interior Board of Land Appeals whether to grant the appellants a stay. When this issue is resolved, the BLM will be in a position to grant the right of way.

The Permittee has fulfilled the requirement to include a description of the documents upon which it bases its right of entry and so is in compliance with R645-301-114. However, before the Permittee can begin construction in the surface facilities portion of the proposed addition to the permit area, it must obtain right of entry from the BLM.

The School and Institutional Trust Lands Administration (SITLA) commented that they administer lands in the current permit area (not the Lila Canyon Tract), including coal resources. However, the existing Horse Canyon Mine MRP is for reclamation only.

SITLA also commented that UEI presently has no applications, leases, permits, rights of way, or rights of entry to conduct any activities on or within these lands. SITLA does not manage the coal resources within the proposed addition to the permit area, only the surface of some areas, so right of entry is not needed unless UEI needs surface access which is not proposed at this time.

Since there will be no surface mining and no fee coal will be mined, an agreement regarding severed private surface and mineral estates is not required.

Findings:

Information provided in the plan is adequate to meet the minimum right of entry requirements of the regulations.

All documentation consisting of lease ownership and the feasibility to mine and reclaim the mine has been submitted in compliance with R645-301-114. However, before the Permittee can begin construction of the surface facilities of the Lila Canyon mine, a Right-of-Entry must be obtained from the BLM.

LEGAL DESCRIPTION AND STATUS OF UNSUITABILITY CLAIMS

Regulatory Reference: 30 CFR 778.16; 30 CFR 779.12(a); 30 CFR 779.24(a)(b)(c); R645-300-121.120; R645-301-112.800; R645-300-141; R645-301-115.

Minimum Regulatory Requirements:

The application will describe and identify the lands (on a map) subject to coal mining over the life of the operation, including the size, sequence, and timing of the mining anticipated and permit boundaries. Coal mining and reclamation operations may only occur on the lands identified on the maps submitted and that are subject to the performance bond.

A public notice advertisement will contain a map or description of the precise location and boundaries of the proposed permit area. So that local residents can identify the area, the map must have a north arrow and may include local landmarks.

Analysis:

According to the plan, the proposed addition to the permit area is not in an area designated as unsuitable for mining, and the Permittee is not aware of petitions to designate the area as unsuitable. The Division is unaware of any designation of the area as unsuitable for mining. Mining operations will not be conducted within 300 feet of an occupied dwelling, but they would be within 100 feet of an Emery County road.

The plan says UEI has received permission from Emery County to construct mining facilities and conduct mining operations within 100 feet of the road, and Appendix 1-4 includes copies of two letters from Emery County documenting this approval. The January 10, 2001, and March 27, 2001, letters signed by Rex Funk, Emery County Road Supervisor, say UEI is authorized to conduct mining activities within 100 feet of the public road. The letters also indicate a 6-foot chain link fence will be installed adjacent to the road right of way near the surface facilities area. A March 22, 2001, letter signed by Bryant Anderson, County Zoning Administrator, gives permission to install a 60-inch culvert under the road and acknowledges that traffic may be limited during installation of this culvert.

Table 4-2 contains legal descriptions of both the current permit area and the proposed addition to the permit area.

Findings:

Information provided in the plan adequately addresses the unsuitability claims and legal description portions of the regulations.

PERMIT TERM

Regulatory References: 30 CFR 778.17; R645-301-116.,

Minimum Regulatory Requirements:

Each permit application will state the anticipated or actual starting and termination date of each phase of the coal mining and reclamation operation and the anticipated number of acres of land to be affected during each phase of mining over the life of the mine. If the applicant requires an initial permit term in excess of five years in order to obtain necessary financing for equipment and the opening of the operation, the application will be complete and accurate covering the specified longer term; and show that the proposed longer term is reasonably needed to allow the applicant to obtain financing for equipment and for the opening of the operation with the need confirmed, in writing, by the applicant's proposed source of financing.

Analysis:

The permit term for which the Permittee is applying is five years. The permit would carry with it the right of successive renewal which would allow for a longer mine life. The beginning of construction is planned for 2001 with mining operations ending in 2025. This assumes adjacent federal leases can be acquired. The plan includes acreage figures for surface and subsurface federal, state, and fee lands.

GENERAL CONTENTS

A certificate of liability insurance meeting Division requirements is in Appendix 8-2 & 8-3.

No facilities or structures would be used in common with another coal mining and reclamation operation.

Findings:

Information in the application is adequate to meet the minimum permit term requirements of the regulations.

PUBLIC NOTICE AND COMMENT

Regulatory References: 30 CFR 778.21; 30 CFR 773.13; R645-300-120; R645-301-117.200.

Minimum Regulatory Requirements:

After the application has been determined "administratively complete," an advertisement must be placed in a local newspaper of general circulation in the locality of the proposed surface coal mining and reclamation operation at least once a week for four consecutive weeks. A copy of the advertisement as it will appear in the newspaper will be submitted to the regulatory authority.

At a minimum, the following will be included in the ad:

- (1) The name and business address of the applicant.
- (2) A map or description
- (3) The location where a copy of the application is available for public inspection.
- (4) The name and address of the Division where written comments, objections, or requests for informal conferences on the application may be submitted.
- (5) If an applicant seeks a permit to mine within 100 feet of the outside right-of-way of a public road or to relocate or close a public road, except where public notice and hearing have previously been provided for this particular part of the road; a concise statement describing the public road, the particular part to be relocated or closed, and the approximate timing and duration of the relocation or closing.
- (6) If the application includes a request for an experimental practice, a statement indicating that an experimental practice is requested and identifying the regulatory provisions for which a variance is requested.

The Division will notify in writing local governmental agencies and all Federal or State governmental agencies involved in or with an interest in the permit process.

Documentation of the public notice and comment period required for the Permit should be incorporated as part of the Permit.

Analysis:

Appendix 1-5 contains copies of the newspaper advertisement and proof of publication. The Division received a comment from one land owner expressing concern about the mine's potential effects on his water. The Division responded to the land owner with information and provided him an opportunity to request an informal conference. There were no requests for an informal conference.

Findings:

Information in the plan is adequate to meet the requirements of this section of the regulations.

GENERAL CONTENTS

FILING FEE

Regulatory Reference: 30 CFR 777.17; R645-301-118.

Minimum Regulatory Requirements:

Each permit application to conduct coal mining and reclamation operations pursuant to the State Program will be accompanied by a fee of \$5.00.

Analysis:

The filing fee is not required for a ~~permit extension~~ significant revision.

Findings:

Information in the plan is adequate to meet the requirements of this section of the regulations.

Page 14

C/007/013-SR98(1)-6 RBO

~~July 19, 2001~~ January 9, 2002

GENERAL CONTENTS

ENVIRONMENTAL RESOURCE INFORMATION

ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR Sec. 783., et. al.

GENERAL

Regulatory Reference: 30 CFR Sec. 783.12; R645-301-411, -301-521, -301-621, -301-721.

Minimum Regulatory Requirements:

Include a description of the existing, pre-mining environmental resources within the proposed permit area and adjacent areas that may be affected or impacted by the proposed underground mining activities.

Analysis:

Environmental Resource information as outlined in R645-301-411, R645-301-521, R645-301-621, and R645-301-721 is intended to describe the pre-mining conditions and an accounting of all resources on and adjacent to the proposed permit area. The Permittee has collected baseline information to describe the existing resources as outlined in the following sections.

Findings:

The Permittee has met the minimum requirements of this section.

PERMIT AREA

Regulatory Requirements: 30 CFR Sec. 783.12; R645-301-521.

Minimum Regulatory Requirements:

Describe and identify the lands subject to surface coal mining operations over the estimated life of those operations and the size, sequence, and timing of the subareas for which it is anticipated that individual permits for mining will be sought.

Analysis:

Plate 5-4 and other maps show the permit boundaries for the Horse Canyon Mine. The permit boundaries are divided into Permit Area A, which is the Horse Canyon project that is now being reclaimed and Permit Area B, which is the proposed Lila Canyon Mine. Plate 5-5, Mine Map shows the sequence and timing for mining operations for the Lila Canyon Mine. The Permittee shows areas of potential future mining on Plate 5-1.

The legal description of the permit area is shown in Table 4-2. The table shows the acres of State, federal and fee land.

Findings:

The Permittee has met the minimum requirements of this section.

HISTORIC AND ARCHEOLOGICAL RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 783.12; R645-301-411.

Minimum Regulatory Requirements:

Describe and identify the nature of cultural historic and archeological resources listed or eligible for listing on the National Register of Historic Places and known archeological sites within the proposed permit and adjacent areas. The description shall be based on all available information, including, but not limited to, information from the State Historic Preservation Officer and local archeological, historical, and cultural preservation groups.

Identify and evaluate important historic and archeological resources that may be eligible for listing on the National Register of Historic Places, through the collection of additional information, conduct of field investigations, or other appropriate analyses.

Analysis:

Appendix 4-1 of the plan contains information from three cultural resource surveys, including one done specifically for the proposed facilities area. There are several cultural resource sites in the vicinity, but only an isolated artifact was found in the proposed disturbed area. In Horse Canyon is a tree inscribed by Sam Gilson, a prominent rancher and promoter of the uses of Gilsonite. According to the Division of State History, the plan, and the text of the current MRP, this site is not listed on the National Register of Historic Places but is eligible for listing. This tree is not in the proposed disturbed area and will not be affected by the proposed operations.

The information in the plan is considered adequate. Maps and reports on archaeological resources have been marked confidential and placed in the Division's confidential file.

There are no cemeteries in or within 100 feet of the proposed addition to the permit area, and it contains no units of the National System of Trails or Wild and Scenic Rivers system.

Findings:

Information provided in the plan is considered adequate to meet the requirements of this section of the regulations. The Division will keep confidential any information that would reveal the location of any of the cultural resource sites.

CLIMATOLOGICAL RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 783.18; R645-301-724.

Minimum Regulatory Requirements:

Provide a statement of the climatological factors that are representative of the proposed permit area, including: the average seasonal precipitation; the average direction and velocity of prevailing winds; and, seasonal temperature ranges.

ENVIRONMENTAL RESOURCE INFORMATION

Additional data may be requested as deemed necessary to ensure compliance with other regulatory requirements.

Analysis:

The proposed mine site is in an area that receives an average annual precipitation of approximately 14 inches. The Permittee indicates an average annual precipitation as high as 13.69 inches: the information was downloaded from the Western Regional Climate Center and is shown in Table 7-1A in Section 724.413. Table 7-1A shows the average maximum and minimum temperatures by month over thirty years (1958 – 88) for the Sunnyside area. Table 7-1A also includes average annual precipitation by month and annually (13.69 inches annually) and average total snowfall by month and annually (36.5 inches annually).

Prevailing winds as reported in Section 742.412 are from west to east at a speed of 2.7 knots or 3.1 mph (knots x 1.1 = mph). Tom Ordh, Meteorologist with the Division of Air Quality, Department of Environmental Quality (DEQ) indicated that the open areas such as Castle Valley would have a wind speed of six miles per hour and canyon winds would be faster, perhaps ten miles per hour.¹ Mr. Ordh indicated that the prevailing winds along the canyon would flow off the plateau. Down in the canyon the wind would be terrain driven. Ordinarily, the winds are upslope in the morning and downslope in the afternoon.

The closest weather station to the Lila Canyon Lease is located at Sunnyside, Utah. Based on relatively close proximity and similar locations, the west exposure of the Book Cliffs, the data from this station will be used to verify precipitation amounts and other weather conditions for the Lila Canyon Project.

Findings:

Information provided in the ~~permit application~~ **proposed amendment** is considered adequate to meet the requirements of this section, however the Division recommends installation of a weather station with a wind gauge to the Permittee.

VEGETATION RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 783.19; R645-301-320.

Minimum Regulatory Requirements:

Provide a map that delineates existing vegetative types and a description of the plant communities within the area affected by surface operations and facilities and within any proposed reference area. The description shall include information adequate to predict the potential for reestablishing vegetation. The map or aerial photograph is required, sufficient adjacent areas shall be included to allow evaluation of vegetation as important habitat for fish and wildlife for those species of fish and wildlife as identified under the fish and wildlife resource information.

¹ Telephone conversation on 5/17/01 with Tom Ordh, meteorologist, Division of Air Quality, Department of Environmental Quality.

Analysis:

Appendices 3-1 and 3-2 contain vegetation information about the Horse Canyon and "South Lease" areas. Additional information is in the existing Horse Canyon Mine MRP. These studies were done in 1981, 1982, 1983, 1985, 1999, and 2000. With the exceptions of a study by Patrick Collins in Appendix VIII-1 in the current Horse Canyon and the 1999 and 2000 vegetation inventories in Appendix 3-2 of the plan, the plan does not show who conducted the studies as required in R645-301-120. According to verbal information from the Permittee, this information is no longer available.

Figure 1 in Appendix 3-2 is a map showing the vegetation communities and the reference area in relation to the proposed disturbance, and Plate 3-2 shows vegetation communities of the proposed addition to the permit area.

The vegetation inventory done in 1999 is for the grass/shrub community and a corresponding reference area to the west of the proposed disturbed area. Predominant species in both areas were cheatgrass, Salina wild rye, snakeweed, blue grama, needle and thread grass, Indian ricegrass, galleta, and purple three awn. Total vegetative cover in the proposed disturbed area was 39.7 percent, and it was 44.8 percent in the reference area. The study includes a map showing the vegetation communities in relation to the proposed disturbance, but it does not show sample locations.

On November 28, 2000, vegetation cover was measured in the proposed disturbed pinyon/juniper community. Only ten samples were taken, but each sample was 0.01 acres, a relatively large sample plot. The mean cover value was 33.9 percent, and cover was dominated by Utah juniper with 80.0 percent relative cover. Other species included Salina wild rye, fourwing saltbush, prickly pear cactus, snakeweed, and galleta.

A table in the 1999 study shows woody plant densities in the proposed disturbed grass/shrub and pinyon/juniper communities and in the reference area. Densities were 6,260; 1,560, and 7,200 stems per acre for these three communities, respectively. In the grass/shrub areas, 88 percent of the woody plants were snakeweed, a plant that is poisonous to cattle and sheep.

Appendix 3-7 contains productivity estimates done by George Cook, formerly of the Natural Resources Conservation Service (NRCS), for the area proposed to be disturbed and associated reference area. Both the grass/shrub proposed disturbed and reference areas had production of about 850 pounds per acre, and the pinyon/juniper community had production of about 250-300 pounds per acre.

Mr. Cook rated the three areas as being in good range condition, but it is unusual for an area with 28 percent relative cover from cheatgrass to be considered in good range condition. It is possible that although cover from cheatgrass was high, cheatgrass production may have been low, and production is the parameter used in range condition assessments.

Vegetation cover, productivity, and woody plant density were the only parameters measured in the pinyon/juniper area. The Permittee did not measure cover from rock, litter, or cryptogams.

ENVIRONMENTAL RESOURCE INFORMATION

Regulation R645-301-321 requires only a description of the plant communities in the proposed disturbed area, adequate to predict the potential for reestablishing vegetation. This regulation specifically includes productivity. The Division's guidelines recommend measuring cover from rock, litter, and cryptogams, but the Division does not believe this information is essential for predicting the revegetation potential for the site. The revegetation and soils reclamation plans have been designed to provide for surface rock cover, and other aspects of ground cover should become established as vegetation becomes established at reclamation.

The Division considers the information in the plan to be adequate as baseline information, and the reference area is acceptable as a success standard. A large enough area was sampled that the Division feels it adequately represents the proposed disturbed area, but the "Vegetation Information Guidelines," which are referenced in the regulations as methods for measuring revegetation success, give minimum sample size criteria that were not met in the baseline sampling. To apply a baseline revegetation standard, the Division would also need measurements of cover from litter that were not included in sampling the pinyon/juniper area.

Appropriateness of the reference area is discussed in the section of this review discussing revegetation success standards.

Findings:

Information provided in the plan is considered adequate to predict the potential for reestablishing vegetation and is thus adequate to meet the requirements of this section of the regulations.

FISH AND WILDLIFE RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 784.21; R645-301-322.

Minimum Regulatory Requirements:

The application shall include fish and wildlife resource information for the permit area and adjacent area. The scope and level of detail for such information shall be determined by the Division in consultation with State and Federal agencies with responsibilities for fish and wildlife and shall be sufficient to design the protection and enhancement plan required under the operation and reclamation plan.

Site-specific resource information necessary to address the respective species or habitats shall be required when the permit area or adjacent area is likely to include:

- (1) Listed or proposed endangered or threatened species of plants or animals or their critical habitats listed by the Secretary under the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.), or those species or habitats protected by similar State statutes;
- (2) Habitats of unusually high value for fish and wildlife such as important streams, wetlands, riparian areas, cliffs supporting raptors, areas offering special shelter or protection, migration routes, or reproduction and wintering areas; or
- (2) Other species or habitats identified through agency consultation as requiring special protection under State or Federal law.

Analysis:

On December 14, 2001, the Board of Oil, Gas and Mining remanded the Division's decision to issue the permit for the Lila Canyon Permit Application partly on the basis that the record does

not disclose the qualifications of those who conducted biological surveys. The applicable regulations read:

130. Reporting of Technical Data.

131. All technical data submitted in the permit application will be accompanied by the names of persons or organizations that collected and analyzed the data, dates of the collection and analysis of the data, and descriptions of the methodology used to collect and analyze the data.

R645-301-132. Technical analyses will be planned by or under the direction of a professional qualified in the subject to be analyzed.

The plan is in compliance with R645-301-301-131. Biological surveys in the plan include the names of the organizations conducting the surveys, dates of data collection, and descriptions of methodology used.

Survey	Organization	Dates of Data Collection	Methodology	Names
Lila Canyon Vegetation Inventory, Appendix 3-2 (B#004837 to 004844)	Environmental Industrial Services (EIS) (B#004837)*	Page 1, (B#004838)	Page 1 (B#004838)	M. Coonrod, K. Salt, and G. Cook, Page 1 (B#004838)
Attachment 3-2, Lila Canyon Veg Survey (B#004846 to 004856)	Environmental Industrial Services (EIS) (B#004846)*	Page 2 (B#004847)	Page 2 (B#004847)	M. Coonrod, and D. Varner (B#004847)
Threatened and Endangered Species Inventories, Appendix 3-4 (B#004864 to 004869)	Environmental Industrial Services (EIS) (B#004866)*	Page 1, (B#004866)	Page 1, (B#004866)	N/A
Raptor Survey, Appendix 3-5 (B#004872 to 004874)	DWR (Personal Communication with Chris Colt)	Page 2, (B#004873)	DWR (Personal Communication with Chris Colt)	DWR (Personal Communication with Chris Colt)

ENVIRONMENTAL RESOURCE INFORMATION

Appendix 3-7, Productivity Within and Around the Permit Area, (B#004899 to 004903)	Environmental Industrial Services (EIS) (B#004901 to 004903)*	Page 1 to 3 (B#004901 to 004903)	Page 1 to 3 (B#004901 to 004903)	George Cook, Page 1 to 3 (B#004901 to 004903)
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*EIS Environmental & Engineering Consulting (EIS)

- Melvin Coonrod Project Manager and Coordinator, Wildlife, Vegetation, Construction and Operations, Reclamation
B.S. Chemistry and Invertebrate Zoology
M.S., Silviculture
- Carl East Wildlife and Vegetation
B.S. Wildlife Management
- Dan Larsen Soils
B.S. Conservation of Natural Resources
M.S. Soil Science
- David Steed Co-Project Manager
B.S. Ecology
(B# 000968)

Regulation R645-301-132 says technical analyses must be planned by or under the direction of a professional qualified in the subject to be analyzed, but it does not say the information needs to be included in the plan. The Bureau of Land Management's environmental assessment for this project lists the qualifications of personnel with Environmental Industrial Services which performed the biological surveys the Division relied upon in issuing this permit. The information is on page 65 of the environmental assessment which is date stamped 000969. Productivity information was obtained by George Cook, a Range Ecologist with the NRCS (now retired, B# 004901 to 004903). The Division's basis for reliance on the information in the plan is the qualifications in the record combined with the Division staff's expertise and experience looking at vegetation at the site.

Wildlife Information

Wildlife habitat is discussed in Section 322.220, and Plate 3-1 shows habitat areas for elk, mule deer, Rocky Mountain bighorn sheep, pronghorns, and raptors. According to Plate 3-1, the proposed disturbed area contains habitat for Rocky Mountain bighorn sheep and mule deer, and pronghorns and raptors are nearby. The proposed addition to the permit area includes areas designated as critical habitat for elk and deer, but the proposed disturbed area does not include these habitats.

Raptor surveys were conducted in the area in 1990, 1998, 1999, and 2000. Plate 3-1 shows locations of five nests within about one mile of the proposed surface facilities, and Appendix 3-5 contains further information, including results of the 2000 raptor survey. According to Plate 3-1, all of the nests near Lila Canyon were golden eagle nests. Section 322.220 says the entire permit area plus an area within 1 mile of the proposed surface facilities were surveyed for raptor nests. Plate 5-3 shows raptor nests and also includes subsidence limits, and this information is consistent

with what is shown on Plate 3-1. According to Plate 5-3, two golden eagle nests are within the subsidence area.

The Permittee commits to conduct raptor surveys within one year prior of all proposed new construction or potentially disruptive mining activity. This should be done in all suitable habitat within a one mile radius of these activities and needs to include the main facilities area. If any of the nests near the proposed facilities is active when the Permittee begins construction, it may be necessary to delay the start of construction until the nest is no longer being used.

The plan indicates the Permittee has consulted with the U.S. Fish and Wildlife Service (USFWS), the Utah Division of Wildlife Resources(UDWR), and the BLM concerning raptor nests in the vicinity of the mine. These agencies determined there is a high probability that any golden eagle nests within one-half mile of the surface facilities would be abandoned.

Information about other wildlife species includes a statement that many birds of high federal interest would not inhabit the permit area because the intermittent stream channels lack riparian vegetation. The plan also references a UDWR publication entitled "Fauna of Southeastern Utah and Life Requisites Regarding their Ecosystems." This publication, which contains general information about species in the area is available to the Division and the public.

Threatened and Endangered Species

Table 3-1 lists seven threatened or endangered species the plan says may occur in Emery County or that could be affected by the mine. Appendix 3-3 contains a February 4, 1998, letter from the USFWS listing threatened and endangered species that occur in Emery County.

The proposed addition to the permit area contains habitat for some species on the list of threatened or endangered species in Emery County, but these species have not been found in on-the-ground surveys. Each species occurring in Emery County is discussed below.

The USFWS commented that the Permittee needs to assess vegetation in the proposed addition to the permit area to determine whether southwestern willow flycatcher habitat exists. According to their letter, breeding habitat is typified by areas of dense willow yor willow mixed with a variety of riparian shrubs and small trees.

The plan documents that the proposed addition to the permit area does not contain habitat for southwestern willow flycatchers. There are no perennial water sources or riparian areas in either the current permit area or the proposed addition, and according to Division representatives who have visited springs in the permit area, there are few, if any, willows or similar riparian-type vegetation associated with the seeps and springs in the proposed addition to the permit area. There may be a few willows or shrubs, but there are no dense patches that would satisfy the habitat requirement of the southwestern willow flycatchers.

ENVIRONMENTAL RESOURCE INFORMATION

Bald eagles are fairly common winter residents of Utah, and they could visit the area. However, they generally like to roost in large trees and such trees do not exist in the proposed disturbed area. Therefore, it is unlikely bald eagles will be adversely affected.

Four fish species of the Upper Colorado River drainage are listed as threatened or endangered, and although the mine would not affect them directly, water usage has been determined to adversely affect these species. As discussed in the fish and wildlife protection portion of this technical analysis, the mine is expected to use about 21.3 acre-feet of water annually, including water lost by evaporation through mine ventilation. A mitigation fee is required when the annual depletion exceeds 100 acre-feet.

Black-footed ferrets have historically been found in eastern Utah, but, with the exception of the population recently reintroduced to the Uintah Basin, there have been no confirmed sightings in recent years. They are considered to be extirpated from Emery County. In addition, habitat of the proposed disturbed area does not meet the requirements of the black-footed ferret.

The following discussion on the distributions of threatened and endangered plant species is based on information in *A Utah Flora* and verbal information from Bob Thompson, an expert botanist with the U.S. Forest Service in Price.

Barneby reed-mustard (*Schoenocrambe barnebyi*) grows at elevations of about 5,600 to 5,700 feet on the Chinle formation. The proposed disturbed area is at a higher elevation, and it does not contain the Chinle Formation. Therefore, the area is not considered habitat for this species.

The reported elevation range for Jones cycladenia (*Cycladenia humilis* Var. *jonesii*) overlaps the proposed disturbed area, but it grows in sandy gypsiferous soils derived from the Cutler, Summerville, and Chinle Formations, and these are not found in the proposed addition to the permit area.

Last chance Townsendia (*Townsendia aprica*) grows in salt desert shrub and pinyon-juniper communities on clay or clay-silt exposures of the Mancos Shale. It has been found mainly in the Fremont Junction area and not on the east side of the San Rafael Swell.

The Maguire daisy (*Erigeron maguirei*) has only been found in a few places in the San Rafael Swell and in Capitol Reef National Park in canyon bottoms in the Wingate and Navajo Sandstone formations. There is essentially no possibility this species could occur in the proposed addition to the permit area.

The Winkler cactus (*Pediocactus winkleri*) is a tiny plant that grows in salt desert shrub communities at lower elevations than those in the proposed disturbed area. Its distribution is more to the west, and it is unlikely it occurs in the proposed addition to the permit area.

Three cactus species are included on the USFWS lists. The San Rafael cactus or Despain footcactus (*Pediocactus despainii*) is very difficult to find and grows in open pinyon/juniper

communities in and on the edges of the San Rafael Swell. This is the type of habitat in the proposed disturbed area, and, according to Bob Thompson of the Forest Service, there is potential this species could occur in the area. However, the plan indicates the Permittee's consultant searched for this plant and did not find it (Appendix 3-4).

According to Mr. Thompson, the Wright fishhook cactus (*Sclerocactus wrightiae*) also has potential of occurring in the area. It grows in salt desert shrub and grass/shrub to juniper communities in soil derived from Mancos Shale and other formations. The Permittee's consultant also searched for and did not find this species (Appendix 3-4).

Ben Franklin of the Utah Natural Heritage Program indicates it is very unlikely either the San Rafael cactus or the Wright fishhook cactus would occur in the area of the proposed mine site. The nearest known occurrences are about 17 and 50 miles away, respectively.

A Division representative who also reviewed the biology portions of the plan, Paul Baker, visited the mine site on June 3, 1999, and May 11, 2000, for the purposes of identifying every plant species it was possible to identify and to look for the San Rafael cactus and Wright fishhook cactus. Mr. Baker has a B.S. degree in botany and an M.S. in range ecology. The field visit reports were finalized on January 4, 2002. The primary focus of the field visits was to try to find the San Rafael cactus. Although June 3 is generally late to be looking for the San Rafael cactus, Mr. Baker had seen it just past blooming one week earlier near Mill Site Reservoir in Emery county. Generally, May 11 would be an ideal time to search for the species. Neither the San Rafael cactus nor the Wright fishhook cactus was found on either of these survey dates, but a species similar to the Wright fishhook cactus, Whipple's fishhook cactus (*Sclerocactus whipplei*), was found and positively identified by flower characteristics in the June 3, 1999, survey.

The Division received comments from the USFWS dated April 14, 1999, October 14, 1999, and April 28, 2000. They said the Division had responded thoroughly to their concerns and concurred with the Division's findings concerning threatened and endangered species.

In July 2001, the Division became aware of the potential that the Mexican spotted owl, a listed threatened species, might possibly occur in the vicinity of the proposed mine. The USFWS had not previously included this species in its correspondence to the Division, but on July 16, 2001, the Division wrote the USFWS requesting additional consultation and its official determination regarding this species for the Lila Canyon Mine location.

The USFWS responded on July 18, 2001, stating that the species list for Carbon and Emery counties was updated in February 2001 to include the Mexican spotted owl. They recommended that the Division conduct a field evaluation with qualified experts to determine if further analysis and/or surveys for Mexican spotted owls is appropriate for the Lila Canyon area. (Frank Howe, UDWR, is the only qualified person in Utah capable of conducting this field evaluation, according to a phone conversation with Laura Romin, USFWS on July 16, 2001.) Following the field evaluation, the proposed mine should be reviewed to determine if it will affect the Mexican spotted owl or its critical habitat. If it determined by the Division with the written concurrence of the USFWS that the

ENVIRONMENTAL RESOURCE INFORMATION

action is not likely to affect this species or its critical habitat, the consultation is complete and no further action is necessary. Formal consultation will be required if the Division determines the proposal is likely to adversely affect this species or if it will result in jeopardy or adverse modification of its critical habitat.

Prior to any surface disturbing activities, the Permittee needs to have a qualified person determine whether the proposed addition to the permit area contains suitable habitat for the Mexican spotted owl. Depending on the results of this evaluation, it may be necessary to further modify the MRP. An alternative to this action is to limit all coal mining and reclamation activities to time periods outside the breeding season, March 1 to August 31.

Findings:

Information in the application is not adequate to meet the requirements of the fish and wildlife information section of the regulations. The following stipulation needs to be added to the permit:

R645-301-323, Prior to any surface disturbing activities, the Permittee must have a qualified person determine whether the proposed addition to the permit area contains suitable habitat for the Mexican spotted owl. Depending on the results of this evaluation, the Permittee will modify the MRP in accordance with requirements of the USFWS. An alternative to this action is to limit all coal mining and reclamation activities to time periods outside the breeding season, March 1 to August 31.

SOILS RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 783.21, 817.200(c); R645-301-411, -301-220.

Minimum Regulatory Requirements:

Provide adequate soil survey information on those portions of the permit area to be affected by surface operations or facilities consisting of a map delineating different soils, soil identification, soil description, and present and potential productivity of existing soils.

Where selected overburden materials are proposed as a supplement or substitute for topsoil, provide results of the analysis, trials and tests required. Results of physical and chemical analyses of overburden and topsoil must be provided to demonstrate that the resulting soil medium is equal to or more suitable for sustaining revegetation than the available topsoil, provided that trials and tests are certified by an approved laboratory. These data may be obtained from any one or a combination of the following sources: U.S. Department of Agriculture Soil Conservation Service published data based on established soil series; U.S. Department of Agriculture Soil Conservation Service Technical Guides; State agricultural agency, university, Tennessee Valley Authority, Bureau of Land Management or U.S. Department of Agriculture Forest Service published data based on soil series properties and behavior; or, results of physical and chemical analyses, field site trials, or greenhouse tests of the topsoil and overburden materials (soil series) from the permit area. If the permittee demonstrates through soil survey or other data that the topsoil and unconsolidated material are insufficient and substitute materials will be used, only the substitute materials must be analyzed.

Analysis:

Chapter 2, Soils, Sections 210 through 224, discusses the soil resources within the proposed Lila Canyon Mine and their potential for soil salvage for future reclamation. Elevation of the

proposed mine facilities is from 5,800 to 6,500 feet. The average annual precipitation is 12 - 14 inches with the majority of the precipitation coming in Fall, Winter and early Spring. The vegetation is primarily pinyon-juniper and sage-grass. Soil productivity of existing soils was determined by Mr. George Cook from NRCS, and results are shown in Appendix 3-7.

The NRCS is currently compiling information for the Emery County Order III soil survey. Relevant portions of this unpublished Order III soil survey are included in Appendix 2-2, such as typical soil pedon descriptions for the four soil map units identified within the mine surface facilities area. The regional Soil Map (Plate 2-1) accompanies this appendix.

An Order 1 soil survey was performed in August 1998 by Mr. Daniel Larsen, Soil Scientist, Environmental Industrial Services (EIS). His report is located in Appendix 2-3. (An addendum attached to Appendix 2-3 is for the proposed fan portal site soils.) The survey contains soil descriptions, soil pedon descriptions, soil salvage suitability analysis, laboratory soil testing data, field soil profile descriptions, soil and landscape photographs, a soils map, and a salvageable-soils map. All mapping and soil survey work were performed according to the standards of the NRCS's National Cooperative Soil Survey. Each soil was classified according to current, unpublished NRCS soil taxonomy, and correlated to a specific soil series:

- DSH Strych fine sandy loam variant, 3 to 8 % slopes
- SBG Strych **bouldery** fine sandy loam, 5 to 15 % slopes
- VBJ Strych **very bouldery** fine sandy loam, 5 to 15 % slopes
- XBS Strych **extremely bouldery** sandy loam, 10 to 45 % slopes
- RBL Rubbleland-Strych-Gerst complex, 20 to 70 % slopes
- RBT Rock outcrop - Travessilla family complex (Atchee Series)

The RBT soil unit references the Travessilla family complex; however, the Travessilla family has been revised by NRCS to the Atchee Series. Six soil map units were identified. From the soil description sheet and Plate 2-2, the Division notes that the canyon bench holds deep soils, stabilized from wind erosion by a surface layer of cryptogams, dried plant litter, boulders and live plant cover. The A horizon layer varies due to position on the slope from 3 inches (at sample site LC 1 through 3) to 26 inches deep (at sample site LC 4). The B horizon stretches from 31 - 60 inches in the profile and is the zone of accumulation of carbonates. The deepest soils are pockets of colluvium from the cliffs above. The soils are underlain by sandstone bedrock, except at the location of the fan portal where shale and burned coal cover the sandstone rock layer. Shale was also encountered at LC 3 and LC 5 (see discussion of SAR and EC below).

Soils are subject to extremes of temperature. On August 6, 1998 at 11:30 a.m., the temperature of the bare soil at location LC4 was 130 °F. At a depth of 20 inches, the temperature was 65 °F. These soils are in a mesic temperature regime (mean annual soil temperature at 50 cm is < 59 °F) as estimated from the mean annual air temperature, reported in Section 220, of 46 °F. Mr. Larsen has judged the moisture regime to be on the aridic side of ustic, which is to say that at a depth of 20 inches (50 cm), there is a difference in soil temperature greater than 9 °F between summer and winter and the soil moisture control section (from 12 to 35 inches deep for sandy soil)

ENVIRONMENTAL RESOURCE INFORMATION

is dry for 90 or more cumulative days in most years, but it is not dry in all parts for more than half the time that the soil temperature is above 9 ° F at a depth of 50 cm.¹

Soil Characterization

Soil pedons descriptions were recorded on standard NRCS forms and are provided in Appendix D within Appendix 2-3. The soil horizons were sampled and analyzed according to the DOGM guidelines for topsoil and overburden². Total nitrogen and available phosphorus were not analyzed at this time; these parameters can be tested at reclamation. Soil texture, rock fragment content (percent by volume), and Munsell color were determined in the field. Generalized soil properties, including percent surface stones and boulders, are summarized in Table 3.21, Properties of Soil Map Units on page 9 of Appendix 2-3. Soil sampling locations are shown on Plate 2-2, Detailed Soils Map of the Mine Facilities Site.

Soil samples were sent to InterMountain Laboratories, Inc. for analysis. Appendix C of Appendix 2-3 contains the laboratory data sheets for all analysis on the 22 samples and duplicate analysis. Overall, soil laboratory test results show a good rating for soil materials (Appendix B of Appendix 2-3), except as noted below:

pH is near neutral in the upper horizons, increasing and approaching pH 8.0 down the profile. At one sample location, LC3, pH 8.0 was exceeded at a depth of 24 - 48 inches. At this depth, LC3 soil was rated poor for a pH of 8.6.

Electrical Conductivity (EC) and Sodium Absorption Ratio (SAR) were below 1.0, except in samples LC3 from 48-55 inches deep and LC5 from 40-58 inches deep. For sample LC3 48-55 inches, the SAR was 18, Exchangeable Sodium Percentage = 22 percent, and EC of 2.48 mmhos/cm (and pH = 7.3). Since the SAR is greater than 15, soil materials below 48 inches are considered unacceptable for salvage. For sample LC5 40-58 inches, the SAR measured 15 with an EC value of 8.89 mmhos/cm (and pH 8.2). The SAR is rated unacceptable for coarse-textured soils and the EC is rated poor; therefore, soil materials below 40 inches are considered marginal at best for reclamation. Sample LC10 0-4 inches had an EC of 2.58 mmhos/cm which has a rating of fair.

Available water holding capacity values fell predominantly into the "fair" range after correction for coarse fragments. Notable exceptions to the fair category were LC1 below 10 inches, LC11 and LC12 entire profiles, LC5 below three inches that were all poor.

¹Soil Survey Staff. 1990. Keys to Soil Taxonomy, fourth edition. SMSS technical monograph no.6. Blacksburg, Virginia. p 33 - 35.

²Leatherwood, J., and Duce, D., 1988. Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining. State of Utah Department of Natural Resources, Division of Oil, Gas and Mining.

The **percent rock content** within the proposed facilities area is the main deterrent for soil salvage suitability based on the current Division Guidelines (citation previously noted). Appendix 2-3 states that native soils with a higher rock content than the current Guidelines allow, can be salvaged.

Organic matter content is relatively low in these soils. Generally, the surface soils ranged between 1.0 to 1.5 percent organic matter and the subsoils were about 0.5 percent. A calcic horizon was verified in soil pedons LC1, LC5 and LC6 with CaCO_3 ranging between 20 to 21 percent. Pedons LC3 and LC4 have some CaCO_3 accumulation in the subsoil but is less than the 15 percent needed to be classified as a calcic horizon. Below the calcic horizon, at depths of 30 inches, the analytical results for these samples show the soluble calcium decreasing and magnesium increasing with depth. (Usually, the reverse is the case where calcium exceeds magnesium in the soil solution, because calcium is retained much more readily than magnesium on soil colloid exchange sites.) But in this case, calcium is being removed from the soil solution by calcium carbonate precipitation in the calcic layer. As a result, soluble magnesium exceeds soluble calcium in the lower soil horizons.

In accordance with R645-301-232.200, since the A horizon is less than six inches deep, the topsoil recovered will be a mix of both the A and B horizon soils. Depths of salvage range from 6 to 18 inches over the site (see Available Soil Resources table in Section 232.100). Large stones, 36 inches or less, are considered part of the soil layer and are included in the topsoil volume estimates.

Substitute Topsoil

The plan does not propose any borrow material as a source for substitute topsoil.

Findings:

Information provided in the plan meets the soil resource information requirements of the regulations.

LAND-USE RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 783.22; R645-301-411.

Minimum Regulatory Requirements:

Provide a statement of the condition; capability, and productivity of the land that will be affected by surface operations and facilities within the proposed permit area.

Provide a map and supporting narrative of the uses of the land existing at the time of the filing of the application. If the premining use of the land was changed within 5 years before the anticipated date of beginning the proposed operations, the historic use of the land shall also be described.

The narrative of land capability and productivity must include the capability of the land before any mining to support a variety of uses, giving consideration to soil and foundation characteristics, topography, vegetative cover, and the hydrology of the area proposed to be affected by surface operations or facilities.

Describe the productivity of the area proposed to be affected by surface operations and facilities before mining, expressed as average yield of food, fiber, forage, or wood products from such lands obtained under high levels of management. The productivity

ENVIRONMENTAL RESOURCE INFORMATION

shall be determined by yield data or estimates for similar sites based on current data from the U.S. Department of Agriculture, State agricultural universities, or appropriate State natural resources or agricultural agencies.

The application must state whether the proposed permit area has been previously mined. If so, provide the following information, if available: the type of mining method used; the coal seams or other mineral strata mined; the extent of coal or other minerals removed; the approximate dates of past mining; and, the uses of the land preceding mining.

The application shall provide a description of the existing land uses and land-use classifications under local law, if any, of the proposed permit and adjacent areas.

Analysis:

Premining land uses of the proposed addition to the permit area include grazing, wildlife habitat, coal mining, and limited recreation. Grazing allotment boundaries are shown on Plate 4-2, and wildlife habitat is shown on Plate 3-1. Production in the grazing allotments in terms of animal unit months is shown in Table 4-3. The land is zoned by Emery County for mining and grazing.

There has been some previous mining activity near Lila Canyon, but it is unknown how much coal was mined. The road on the bottom of Lila Canyon was built in the 1950's to provide access for coal exploration. In addition a sealed breakout is located in the left fork of Lila Canyon where the Sunnyside Seam is exposed. Coal was transported out through the Horse Canyon Mine. It is believed the breakout was opened during the 1970's or early 1980's, and it is within the current permit area.

According to the plan, Lila Canyon is within an area identified by the BLM as the Range Valley Mountain Habitat Management Plan Area. A habitat management plan was adopted in 1991 to provide management for various wildlife and for access management.

The proposed addition to the permit area does not support a wide variety of land uses because of the limited access and remote location, rugged topography, limited soils, and lack of rainfall and surface water. Water rights are discussed in Chapter 7, and water uses include stock watering and various uses for coal mining.

Boundaries of the Turtle Canyon Wilderness Study Area and the areas identified in the 1999 BLM wilderness inventory as having wilderness characteristics, both discussed below, are shown on Plate 4-4. A small portion of the proposed permit area addition overlaps with the Turtle Canyon Wilderness Study Area. The plan contains a copy of the BLM's 1993 Environmental Assessment (EA) prepared for management of the Turtle Canyon Wilderness Study Area, and it states that underground mining would be acceptable in this area.

The BLM's 1999 Utah Wilderness Inventory identifies areas with wilderness characteristics in addition to the previously-identified wilderness study areas. Two of these areas overlap the proposed addition to the permit area including the proposed disturbed area and are identified as the Desolation Canyon Wilderness Inventory Unit and the Turtle Canyon Inventory Unit. The plan includes copies of two memoranda from the BLM (Appendix 4-2). In a memo dated April 15, 1999, John Leshy, Office of the Solicitor for the Department of Interior, to the Utah State Director of the BLM wrote, "While the planning process is being completed on lands found to have wilderness

characteristics in the 1999 Wilderness Inventory, the management prescriptions of existing land management plans do not change.” The BLM plan for this area has not changed to date.

Furthermore, the wilderness inventory areas are subject to valid existing rights, and the Lila Canyon proposal falls into that realm.

Findings:

Land use information provided in the plan meets the requirements of this section of the regulations.

ALLUVIAL VALLEY FLOORS

Regulatory Reference: 30 CFR Sec. 785.19; R645-302-320.

Minimum Regulatory Requirements:

This section applies to surface coal mining and reclamation operations on areas or adjacent to areas including alluvial valley floors in the arid and semiarid areas west of the 100th meridian.

Alluvial valley floor determination

Permit applicants who propose to conduct surface coal mining and reclamation operations within a valley holding a stream or in a location where the permit area or adjacent area includes any stream, in the arid and semiarid regions of the United States, as an initial step in the permit process, may request the Division to make an alluvial valley floor determination with respect to that valley floor. The applicant shall demonstrate and the Division shall determine, based on either available data or field studies submitted by the applicant, or a combination of available data and field studies, the presence or absence of an alluvial valley floor. Studies shall include sufficiently detailed geologic, hydrologic, land use, soils, and vegetation data and analysis to demonstrate the probable existence of an alluvial valley floor in the area. The Division may require additional data collection and analysis or other supporting documents, maps, and illustrations in order to make the determination.

The Division shall make a written determination as to the extent of any alluvial valley floors within the area. The Division shall determine that an alluvial valley floor exists if it finds that unconsolidated streamlaid deposits holding streams are present; and there is sufficient water available to support agricultural activities as evidenced by the existence of current flood irrigation in the area in question; the capability of an area to be flood irrigated, based on evaluations of streamflow, water quality, soils, and topography; or, subirrigation of the lands in question derived from the ground-water system of the valley floor.

If the Division determines in writing that an alluvial valley does not exist pursuant to the requirements of this section, no further consideration of this section is required.

Applicability of statutory exclusions

If an alluvial valley floor is identified and the proposed surface coal mining operation may affect this alluvial valley floor or waters that supply the alluvial valley floor, the applicant may request the Division, as a preliminary step in the permit application process, to separately determine the applicability of the statutory exclusions set forth in this section. The Division may make such a determination based on the available data, may require additional data collection and analysis in order to make the determination, or may require the applicant to submit a complete permit application and not make the determination until after the complete application is evaluated.

An applicant need not submit the information required and the Division is not required to make the findings required of this section when the Division determines that one of the following circumstances, heretofore called statutory exclusions, exist:

1. The premining land use is undeveloped rangeland that is not significant to farming;
2. Any farming on the alluvial valley floor that would be affected by the surface coal mining operation is of such small acreage as to be of negligible impact on the farm's agricultural production. Negligible impact of the proposed operation on farming will be based on the relative importance of the affected farmland areas of the alluvial valley floor area to the farm's total agricultural production over the life of the mine; or,

ENVIRONMENTAL RESOURCE INFORMATION

3. The circumstances set forth in Section 822.12(b)(3) or (4) of this Chapter exist.

For the purpose of this section, a farm is one or more land units on which farming is conducted. A farm is generally considered to be the combination of land units with acreage and boundaries in existence prior to August 3, 1977, or if established after August 3, 1977, with those boundaries based on enhancement of the farm's agricultural productivity and not related to surface coal operations.

(c) Summary denial. If the Division determines that the statutory exclusions are not applicable and that any of the required findings of Paragraph (e)(2) of this section cannot be made, the Division may, at the request of the applicant:

(1) Determine that mining is precluded on the proposed permit area and deny the permit without the applicant filing any additional information required by this section; or

(2) Prohibit surface coal mining and reclamation operations in all or parts of the area to be affected by mining.

(d) Application contents for operations affecting designated alluvial valley floors. (1) If land within the permit area or adjacent area is identified as an alluvial valley floor and the proposed surface coal mining operation may affect an alluvial valley floor or waters supplied to an alluvial valley floor, the applicant shall submit a complete application for the proposed surface coal mining and reclamation operations to be used by the Division together with other relevant information as a basis for approval or denial of the permit. If an exclusion of Paragraph (b)(2) of this section applies, then the applicant need not submit the information required in Paragraphs (d)(2)(ii) and (iii) of this section.

(2) The complete application shall include detailed surveys and baseline data required by the Division for a determination of--

(i) The essential hydrologic functions of the alluvial valley floor which might be affected by the mining and reclamation process.

The information required by this subparagraph shall evaluate those factors which contribute to the collecting, storing, regulating and making the natural flow of water available for agricultural activities on the alluvial valley floor and shall include, but are not limited to:

(A) Factors contributing to the function of collecting water, such as amount, rate and frequency of rainfall and runoff, surface roughness, slope and vegetative cover, infiltration, and evapotranspiration, relief, slope and density of drainage channels;

(B) Factors contributing to the function of storing water, such as permeability, infiltration, porosity, depth and direction of ground-water flow, and water holding capacity;

(C) Factors contributing to the function of regulating the flow of surface and ground water, such as the longitudinal profile and slope of the valley and channels, the sinuosity and cross-sections of the channels, interchange of water between streams and associated alluvial and bedrock aquifers, and rates and amount of water supplied by these aquifers; and

(D) Factors contributing to water availability, such as the presence of flood plains and terraces suitable for agricultural activities.

(ii) Whether the operation will avoid during mining and reclamation the interruption, discontinuance, or preclusion of farming on the alluvial valley floor;

(iii) Whether the operation will cause material damage to the quantity or quality of surface or ground waters supplied to the alluvial valley floor;

(iv) Whether the reclamation plan is in compliance with requirements of the Act, this Chapter, and regulatory program; and

(v) Whether the proposed monitoring system will provide sufficient information to measure compliance with Part 822 of this Chapter during and after mining and reclamation operations.

(e) Findings. (1) The findings of Paragraphs (e)(2)(i) and (ii) of this section are not required with regard to alluvial valley floors to which are applicable any of the exclusions of Paragraph (b)(2) of this section.

(2) No permit or permit revision application for surface coal mining and reclamation operations on lands located west of the 100th meridian west longitude shall be approved by the Division unless the application demonstrates and the Division finds in writing, on the basis of information set forth in the application, that

(i) The proposed operations will not interrupt, discontinue, or preclude farming on an alluvial valley floor;

(ii) The proposed operations will not materially damage the quantity or quality of water in surface and underground-water systems that supply alluvial valley floors; and

(iii) The proposed operations will comply with Part 822 of this Chapter and the other applicable requirements of the Act and the regulatory program.

Analysis:**Alluvial valley floor determination**

This section summarizes the land use, soil, plants, geology, surface- and ground-water information reviewed by the Division in making the findings required under R645-302-320.

The Lila Canyon Mine is situated in the western Book Cliffs escarpment. Steeply dipping joints transmit ground water from the surface (Section 6.5.3.5) as illustrated in Figure VI-5. Water inflow associated with fault or fracture systems are possible, but not expected to be significant (Section 6.6.1). The surface expressions of the faulting are grabens and draws. Numerous small

springs and seeps exist within and adjacent to the permit area (Section 731.220). Appendix 7-3 Probable Hydrologic Consequences (PHC) of mining concludes that the proposed mine is not expected to cause "contamination, diminution or interruption" of underground or surface sources of water.

The Sunnyside Sandstone contains the two seams of interest: Upper Sunnyside and Lower Sunnyside seams. "The Sunnyside Sandstone is known to transmit groundwater in the Sunnyside area and that portion of the sandstone which underlies the Lower Sunnyside seam is occasionally considered to be a potential aquifer" (Section 6.4.1). Geneva Mine records indicate that the mine was dry until the Sunnyside Fault was intercepted. This suggests that as mining progresses down dip, "substantial" water may be encountered. It is thought that the water encountered is isolated from the surface recharge zone (Section 6.6.3.1).

The Mancos Shale forms the slopes below the base of the Book Cliffs, overlain in places by pediment deposits (Section 6.4.1 and Plate 6-1). In the permit area, ephemeral drainages flow in response to snow melt and precipitation events (Section 731.220 and Plate 7-1). Coleman Wash receives the Lila Canyon drainage. Grassy Wash and Marsh Flat Wash collect the flow from the Mancos slopes further south. Little Park Wash channels the flow on the plateau above. There is no valley holding a stream in the permit area (Section 724.700).

The Order III soil survey (Plate 2-1), of the mine permit area soils indicates that the soils on the plateau in Little Park Wash are Neto Fine Sandy Loam (Section 222.200). No further information on this soil is available in the plan. This soil is comparable to the Glenberg soil described in the published Carbon County Soil Survey ¹.

Plate 3-2, Vegetation indicates that the dominant species growing on the plateau in the vicinity of Little Park Wash are *Atriplex*, *Artemesia* and *Elymus*, none of which are wetland species.

¹ Little Park Wash falls within the Little Park grazing allotment (Plate 4-2). The land use is unimproved rangeland and wildlife habitat.

There is no farming activity upstream or downstream of the permit area, therefore, the proposed operations will not interrupt, discontinue, or preclude farming on an alluvial valley floor.

Based on the information provided in the plan, in accordance with R645-302-321.100, the Division finds that there is no probable existence of an alluvial valley floor.

Findings:

Information provided in the plan is considered adequate to meet the requirements of this section of the regulations.

¹ Telephone conversation on 06/05/01 with Mr. Leland Sasser, Soil Scientist and Survey Project Leader with Natural Resource Conservation Service, Price Field Office, Utah.

¹ Cooper, David J. 1989. A Handbook of Wetland Plants of the Rocky Mountain Region. EPA Region VIII.

ENVIRONMENTAL RESOURCE INFORMATION

PRIME FARMLAND

Regulatory Reference: 30 CFR Sec. 785.16, 823; R645-301-221, -302-270.

Minimum Regulatory Requirements:

The U.S. Soil Conservation Service within each State shall establish specifications for prime farmland soil removal, storage, replacement, and reconstruction. The Division shall use the soil-reconstruction specifications to carry out its responsibilities under this section.

The requirements of this part shall not apply to:

Note: This section is suspended "insofar as it excludes from the requirements of Prime Farmlands those coal preparation plants, support facilities, and roads that are surface mining activities".

- (1) Coal preparation plants, support facilities, and roads of surface and underground mines that are actively used over extended periods of time and where such uses affect a minimal amount of land.
- (2) Disposal areas containing coal mine waste resulting from underground mines that is not technologically and economically feasible to store in underground mines or on non-prime farmland. The operator shall minimize the area of prime farmland used for such purposes.
- (3) Prime farmland that has been excluded in accordance with any valid existing rights as indicated below.

This section applies to any person who conducts or intends to conduct surface coal mining and reclamation operations on prime farmland historically used for cropland. This section does not apply to:

- (1) Lands on which surface coal mining and reclamation operations are conducted pursuant to any permit issued prior to August 3, 1977; or
- (2) Lands on which surface coal mining and reclamation operations are conducted pursuant to any renewal or revision of a permit issued prior to August 3, 1977; or
- (3) Lands included in any existing surface coal mining operations for which a permit was issued for all or any part thereof prior to August 3, 1977, provided that: such lands are part of a single continuous surface coal mining operation begun under a permit issued before August 3, 1977; and the permittee had a legal right to mine the lands prior to August 3, 1977, through ownership, contract, or lease but not including an option to buy, lease, or contract; and the lands contain part of a continuous recoverable coal seam that was being mined in a single continuous mining pit (or multiple pits if the lands are proven to be part of a single continuous surface coal mining operation) begun under a permit issued prior to August 3, 1977.

For purposes of this section, renewal of a permit means a decision by the Division to extend the time by which the permittee may complete mining within the boundaries of the original permit, and revision of the permit means a decision by the Division to allow changes in the method of mining operations within the original permit area, or the decision of the Division to allow incidental boundary changes to the original permit. A pit shall be deemed to be a single continuous mining pit even if portions of the pit are crossed by a road, pipeline, railroad, or powerline or similar crossing. A single continuous surface coal mining operation is presumed to consist only of a single continuous mining pit under a permit issued prior to August 3, 1977, but may include non-contiguous parcels if the operator can prove by clear and convincing evidence that, prior to August 3, 1977, the non-contiguous parcels were part of a single permitted operation. For the purposes of this paragraph, clear and convincing evidence includes, but is not limited to, contracts, leases, deeds or other properly executed legal documents (not including options) that specifically treat physically separate parcels as one surface coal mining operation.

All permit applications, whether or not prime farmland is present, shall include the results of a reconnaissance inspection of the proposed permit area to indicate whether prime farmland exists. The Division in consultation with the U.S. Soil Conservation Service shall determine the nature and extent of the required reconnaissance inspection.

If the reconnaissance inspection establishes that no land within the proposed permit area is prime farmland historically used for cropland, the applicant shall submit a statement that no prime farmland is present. The statement shall identify the basis upon which such a conclusion was reached.

If the reconnaissance inspection indicates that land within the proposed permit area may be prime farmland historically used for croplands, the applicant shall determine if a soil survey exists for those lands and whether soil mapping units in the permit area have been designated as prime farmland. If no soil survey exists, the applicant shall have a soil survey made of the lands within the permit area which the reconnaissance inspection indicates could be prime farmland. Soil surveys of the detail used by the U.S. Soil Conservation Service for operational conservation planning shall be used to identify and locate prime farmland soils.

If the soil survey indicates that no prime farmland soils are present within the proposed permit area, the plan shall include the results of a reconnaissance inspection of the proposed permit area to indicate whether prime farmland exists.

Analysis:

A reconnaissance investigation was performed by the NRCS on June 8, 1998. There is no developed irrigation system and the soils are arid. The NRCS determined that no Prime Farmland nor farmland of statewide importance exists within the permit area. The prime farmland determination letter is included in Appendix 2-1. The Division concurs with this determination.

Findings:

The Division has determined that there is no Prime Farmland in the permit area.

GEOLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 784.22; R645-301-623, -301-724.

Minimum Regulatory Requirements:

Each application shall include geologic information in sufficient detail to assist in: determining the probable hydrologic consequences of the operation upon the quality and quantity of surface and ground water in the permit and adjacent areas, including the extent to which surface- and ground-water monitoring is necessary; determining all potentially acid- or toxic-forming strata down to and including the stratum immediately below the coal seam to be mined; determining whether reclamation can be accomplished and whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area; and, preparing the subsidence control plan.

Geologic information shall include, at a minimum, a description of the geology of the proposed permit and adjacent areas down to and including the deeper of either the stratum immediately below the lowest coal seam to be mined or any aquifer below the lowest coal seam to be mined which may be adversely impacted by mining. This description shall include the areal and structural geology of the permit and adjacent areas, and other parameters which influence the required reclamation and it shall also show how the areal and structural geology may affect the occurrence, availability, movement, quantity, and quality of potentially impacted surface and ground water. It shall be based on maps and plans required as resource information for the plan, detailed site specific information as required below, and, geologic literature and practices.

For any portion of a permit area in which the strata down to the coal seam to be mined will be removed or are already exposed, samples shall be collected and analyzed from test borings; drill cores; or fresh, unweathered, uncontaminated samples from rock outcrops down to and including the deeper of either the stratum immediately below the lowest coal seam to be mined or any aquifer below the lowest coal seam to be mined which may be adversely impacted by mining. The analyses shall result in the following:

- (1) Logs showing the lithologic characteristics including physical properties and thickness of each stratum and location of ground water where occurring;
- (2) Chemical analyses identifying those strata that may contain acid- or toxic-forming, or alkalinity-producing materials and to determine their content, except that the Division may find that the analysis for alkalinity-producing material is unnecessary; and
- (3) Chemical analysis of the coal seam for acid- or toxic-forming materials, including the total sulfur and pyritic sulfur, except that the Division may find that the analysis of pyritic sulfur content is unnecessary.

For lands within the permit and adjacent areas where the strata above the coal seam to be mined will not be removed, samples shall be collected and analyzed from test borings or drill cores to provide the following data:

- (1) Logs of drill holes showing the lithologic characteristics, including physical properties and thickness of each stratum that may be impacted, and location of ground water where occurring;
- (2) Chemical analyses for acid- or toxic-forming or alkalinity-producing materials and their content in the strata immediately above and below the coal seam to be mined;
- (3) Chemical analyses of the coal seam for acid- or toxic-forming materials, including the total sulfur and pyritic sulfur, except that the Division may find that the analysis of pyrite sulfur content is unnecessary; and
- (4) For standard room-and-pillar mining operations, the thickness and engineering properties of clays or soft rock such as clay shale, if any, in the stratum immediately above and below each coal seam to be mined.

ENVIRONMENTAL RESOURCE INFORMATION

If determined to be necessary to protect the hydrologic balance, to minimize or prevent subsidence, or to meet the performance standards, the Division may require the collection, analysis, and description of additional geologic information.

An applicant may request the Division to waive in whole or in part the requirements of the borehole information or analysis required of this section. The waiver may be granted only if the Division finds in writing that the collection and analysis of such data are unnecessary because other information having equal value or effect is available to the Division in a satisfactory form.

Analysis:

On December 14, 2001, the Board of Oil, Gas and Mining remanded the Division's decision to issue the permit for the Lila Canyon Permit Application on the basis that the Board believed the administrative record was lacking in baseline data on acid- and toxic-forming materials. The following discussion and analysis have been clarified to demonstrate that these requirements have been met.

**ACID/TOXIC SAMPLING REQUIREMENT WAIVER
QUICK REFERENCE BY SUBTOPIC**

SubTopic	Bate Stamped Number
General knowledge of acid toxic forming properties of Book Cliffs Coal Field: Horse Canyon Mine and Sunnyside Mine	B#003524-003534, B#003537-003565, B#005193, B#005383, B#006137-006168, B#005193, B#005383,
Appendix 6-2, Typical Core Hole Quality	B#005306-005325
Drill Logs	B#005180, B#005192, B#005211, B#005239, B#005258-9
Cores from adjacent area	B#005377, B#006137- 006168, B#006173-4
Projected composition of slope rock material	B#005000
Coal -free, non-acid, non-toxic material used for pads	B#005045, B#005068
Commitment to analyze prior to disposal	B#005062, B#005122, B#005125
Refuse pile design: limits water infiltration and provides four feet of cover	B#005077, B#005118-005127, B#004495, B#005119, B#005377, B#006146
Refuse pile differs from Sunnyside	B#000744, B#005121, B#005197, B#005046
Precipitation	B#005349, B#005351
Surface water protection through materials handling and drainage control	B#004986, B#004999, B#005045-6, B#005068, B#005362-3
Monitoring of underground usage and discharge	B#005381, B#005376, B#005340

Geologic information includes a description of the geology of the proposed permit and adjacent areas down to and including the stratum immediately below the lowest coal seam to be mined. The coal seams and adjacent strata ~~comprise~~ are described by the Permittee as an aquifer that may be intercepted by mining. ~~and the~~ It is also stated that the surrounding geology influences the occurrence, availability, movement, quantity, and quality of potentially impacted surface and ground water. Although the coal seam and adjacent strata are saturated, the Division does not consider this to be an aquifer under the definition in the Coal Mining Rules because:

- it has no specific (or even general) use,
- there is no lateral distribution of water within the zone,
- it is separated from upper formations by layers of low-permeability rock,
- it does not maintain or buffer the hydrologic balance of the permit and adjacent areas, and
- it is not a factor in the planned reclamation and post-mining land use.

The plan includes geologic information in sufficient detail to assist in determining the PHC of the operation upon the quality and quantity of surface and ground water in the permit and adjacent areas, including the extent to which surface- and ground-water monitoring is necessary, and whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area.

Resource maps and plans and site specific information are based on published geologic information, permit plans of the adjacent Sunnyside and South Lease areas, and exploration and drilling records of Kaiser Steel, U. S. Steel Corporation, and IPA. Copies of some drill logs are included in Appendix 6-1 of the Lila Canyon ~~Significant Revision Permit Application~~ and others logs are available, but some of the original documentation is not readily available.

Strata above the coal seam to be mined will not be removed, so samples have been collected and analyzed from test borings or drill cores. Bore holes S-1 through S-23 were drilled between 1948 and 1975 by Kaiser Steel Corporation. S-24 through S-31 were drilled in 1980 and 1981.

An unsuccessful attempt was made to convert S-26, S-28, and S-31 to ground-water observation wells. ~~S-26 and S-31~~ These three wells, located south of the Williams Draw Fault, were offset with shallow piezometers A-26, A-28 and A-31 to observe ground water in the alluvium (Table 6-3, B#005176). Table 6-3 does not indicate that these wells have been plugged and abandoned; however, the Permittee has no data on ~~A-26 and A-31~~ these piezometers- because they did not drill them and no one has maintained them (Section 6.5.1, p. 21, B#005177). ~~and~~ They are considered ~~these wells~~ unusable for ground-water monitoring (Section 724.100, B# 005346). Because of the age, lack of maintenance, and lack of data from these piezometers, the Division concurs that no useful information can be obtained from them, however such information is not critical to the Division's findings.

S-32 was drilled in 1981 in SE1/4SW1/4 Sec. 6, T. 17 S., R. 15 E as an exploration hole and was completed as a piezometer in the Grassy Member of the Blackhawk Formation. The Permittee states that other than the log (copy in Appendix 6-1, B# 005278 to 005290) there are no other

ENVIRONMENTAL RESOURCE INFORMATION

geologic or piezometric data from S-32 (Section 6.5.1, B# 005177). However, the Kaiser Steel Company South Lease Supplemental Submission Book 2 in DOGM's files (Bates 006054 to 006343) contains additional information that has been used by the Division in evaluating this permit application and determining the CHIA.

The Horse Canyon Well and the Minerals Development Corporation (MDC) well shown on Plate 7-1 (B# 005659) were bored in Horse Canyon to monitor water in the alluvium (Section 6.5.1). There are no logs or other geologic or hydrologic data from these wells in the Lila Canyon Permit Application. **Significant Revision.** UEI has stated in the PAP that they will attempt to use the Horse Canyon Well to produce water for mining and reclamation operations, then seal and plug it during reclamation (Section 724.100, B# 005342).

In 1993 and 1994 IPA-1, IPA-2, and IPA-3 were drilled. Results of proximate and ash analyses of floor and roof material from IPA-1, IPA-2 (roof only), and IPA-3 are in Appendix 6-2 (B# 005306). There are also proximate, ultimate, sulfur (total and pyritic), ash, and several other analyses for "middle" coal samples from the three bore holes (B# 005306 to 005325). Projected maximum height of mining is 8.5 feet according to the Resource Recovery and Protection Plan (R2P2): Plate 6-3 (B# 005328) shows the minimum coal thickness is 11 feet, so coal will likely be left in both the roof and probably also in the floor.

Copies of bore-hole logs for IPA-1, IPA-2, IPA-3, S-14, S-27, and S-32 are in Appendix 6-1 (B# 005200). Ground water was noted on the logs for IPA -1 and IPA-2: fluid levels were reported for S-27 and S-32 but the fluid may have been static drilling fluid in the bore hole rather than ground water. These logs show lithologic characteristics, including physical properties and thickness of each stratum that may be impacted. In addition to the bore holes, coal seams and adjacent strata were measured at seventeen outcrop locations in 1974 and 1975. Lithology and thickness of the coal seams and adjacent strata, based on the bore holes and measured out-crop sections, are shown on Plate 6-5 (B# 005330).

Engineering properties of the strata immediately above and below the coal seam to be mined are listed in Table 6-6 (B# 005194). Data are based on core samples from bore holes S-18 and S-22.

The Permittee was not required by the Division to submit any analyses for acid- and toxic-forming materials for strata immediately above and below the Sunnyside Seam. Pursuant to the provisions of R645-301-626, and based on discussions with UEI during the review process and information submitted in the PAP; the Division found it reasonable to waive the requirements of R645-301-624.300. Other information having equal or greater value or effect is available to the Division in a satisfactory form. This other information can provide the basis for analysis of acid- and toxic-forming or alkalinity producing materials. Other information of equal or greater value includes:

1. general knowledge of acid- and toxic-forming properties of rocks in the Book Cliffs Coal Field;
2. drill logs from the permit area;

3. analyses of cores from the adjacent area for strata immediately above and below the Sunnyside Seam;
4. a commitment to analyze coal-mine waste for acid- and toxic-forming materials before permanent disposal at the surface; and
5. an approved plan for operation and reclamation of a refuse pile that includes:
 - a. burial of all coal-mine waste under a minimum of four feet of subsoil and topsoil; and
 - b. design and construction that will prevent or limit infiltration of precipitation and contamination of runoff and ground water.

Each of these items is described in detail below.

1. The Blackhawk Formation is not known as producing acid or toxic drainage or containing acid- or toxic-forming materials. The Permittee states that with over 100 years of mining in the Sunnyside Mining Operation, there have been no proven problems with acid- or toxic-forming materials (Section 6.5.5.1; Bates 005193), and that the Sunnyside Seam is not known to be acid-producing or iron-producing (Bates 005383, 003524-003534, 003537-003565). The Division is aware of an instance where acid water formed at the Sunnyside Mine slurry pond, but it did not cause problems or offsite impacts.

2. The drill-hole logs in Appendix 6-1 indicate some pyrite is present in the Blackhawk Formation, both above and below as well as within the Sunnyside Seam (Bates 005180, 005192, 005211, 005239, 005258, 005259).

3. Kaiser Steel had ACZ Inc. analyze core samples from bore-holes KSC-S-24-80 and KSC-S-25-8, which are located approximately two miles south of the Lila permit area boundary and near Williams Draw. Results (Bates 006137"back"-006168, 006173, 006174) indicate two zones with possible boron and salt problems (Bates 006142). The recommendation from ACZ was that any such potentially acid- and toxic-forming materials disposed of on the land surface should be buried under a minimum of four feet of inert material (Bates 005377, 006146); this is also the requirement in the Utah Coal Mining Rules for burial of such materials, unless physical and chemical analyses show that the requirements of the Rules can be met with less cover (R645-301-553.252). The reclamation plan specifies 4 feet of subsoil and topsoil will be placed over all refuse: see Chapters 2, 5, and 7, and Appendix 5-7 (Bates 005118-005127) for details on the refuse pile.

4. Access to the underground workings of the Lila Canyon Mine will be provided by two rock slopes driven upwards from the base of the cliff to the coal seam. Rock that will be removed from the tunnels will be called "slope-rock", and it fits most closely into the classification of underground development waste. The slope-rock underground development waste will contain mostly shale, sandstone, and mudstone. Traces of coal may be found, but the Permittee believes the amount will be insignificant (P. 19 of Chapter 5, B# 005000).

Coal-free slope-rock material that meets non-acid and non-toxic criteria will be used to as structural fill in areas to be used as pads ~~in the coal pile storage areas~~, with any additional being placed in the refuse pile (Sections 528.320, 537.200; B# 005045, 005068). ~~sandstone materials may~~

ENVIRONMENTAL RESOURCE INFORMATION

~~be crushed and used for gravel (Section 528.320), although the use for the gravel is not described.~~

~~The Permittee states that with over 100 years of mining in the Sunnyside Mining Operation, there have been no proven problems with acid- or toxic-forming materials (Section 6.5.5.1). The Division is aware of an instance where acid water formed at the Sunnyside slurry pond, but it did not cause problems or offsite impacts. Materials will be handled to minimize acidic, toxic and other harmful infiltration into the groundwater systems (Section 731, B# 005362). To further ensure that surface and ground waters will not be polluted by acid or toxic materials, the slope-rock material (underground development waste) will be examined and tested as necessary to determine acid- and toxic-forming potential (Section 536, B# 005062 of the plan). In Appendix 5-7, the Permittee commits to sample the rock-slope material three times as the rock-slope tunnels are built. They will also take a one sample for of coal processing waste for every 10,000 tons of waste generated by normal mining operations, disposed of in the refuse pile (B# 005122). These samples will be analyzed according to the parameters listed in Table 2 of Appendix 5-7 (B# 005125). The Division requires that the slope-rock material be disposed of in a refuse pile. At a minimum, the material in the refuse pile must be covered with 4 feet of non-acid and non-toxic forming material. (See Chapters 2, 5, and 7, and Appendix 5-7 for details.)~~

5. The Coal Mining Rules require that underground development waste, including the slope-rock material and coal processing waste be disposed of in the refuse pile and be covered, at a minimum with 4 feet of non-acid and non-toxic forming material. The reclamation plan specifies 4 feet of subsoil and topsoil will be placed over the refuse pile (Section 553.300, B# 005077). The slope-rock underground development waste used to build the pads will be left in place for final reclamation and buried with 4 feet of subsoil and topsoil. See (Chapters 2, 5, and 7, and Appendix 5-7) (B# 005118 to 005127) for details on the refuse pile.

Coal processing waste from the crusher will be ~~placed in disposal areas within the permit area deposited in the refuse pile (B# 005046)~~. The refuse pile has been designed as a location for the storage of underground development waste that is brought to the surface, including any excess slope-rock not used as fill; it is not anticipated by the Permittee that any underground waste other than the slope-rock will be brought to the surface (B# 004999, 005062 to 006063). The capacity of the pile is designed for ~~150,000~~ 44,000 tons, which is in excess of projected needs. Material not transported to the surface, such as overcast material, rock falls, and slope material may be disposed of underground according to the appropriate MSHA regulations (B# 004986). Because this will be an underground mine there will be no spoil.

The coal seam crops out at an elevation of approximately 6,500 feet in the vicinity of the rock-slope tunnels. The plan indicates the tunnels will intercept the coal seam at approximately 6,300 feet (P. 19 of Section 520, ~~Appendix 8-2~~- Figure 7-1; B# 005000, 900637).

Underground mining always has a potential for impacting surface water, ground water, and other surface resources. The Permittee states in Section ~~721~~ 525 (B# 005030 to 005031) that subsidence effects are expected to be minimal due to the amount of cover and massive rock strata between the mining and the surface. Coal-seam elevations determined from bore holes are on Plate

6-4 - Cover and Structure Map (B# 005329). Geologic information is sufficient to assist in preparing the subsidence control plan.

Findings:

Geologic Resource Information is considered adequate to meet the requirements of this section.

HYDROLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 701.5, 784.14; R645-100-200, -301-724.

Minimum Regulatory Requirements:

Sampling and Analysis.

All water-quality analyses performed to meet the requirements of this section shall be conducted according to the methodology in the 15th edition of "Standard Methods for the Examination of Water and Wastewater," which is incorporated by reference, or the methodology in 40 CFR Parts 136 and 434. Water-quality sampling shall be conducted according to either methodology listed above when feasible. This incorporation by reference was approved by the Director of the Federal Register on October 26, 1983. This document is incorporated as it exists on the date of the approval, and a notice of any change in it will be published in the Federal Register.

Baseline information.

The application shall include the following baseline hydrologic information, and any additional information required by the Division.

- (1) Ground-water information. The location and ownership for the permit and adjacent areas of existing wells, springs, and other ground-water resources, seasonal quality and quantity of ground water, and usage. Water-quality descriptions shall include, at a minimum, total dissolved solids or specific conductance corrected to 25°C, pH, total iron, and total manganese. Ground-water quantity descriptions shall include, at a minimum, approximate rates of discharge or usage and depth to the water in the coal seam, and each water-bearing stratum above and potentially impacted stratum below the coal seam.
- (2) Surface-water information. The name, location, ownership, and description of all surface-water bodies such as streams, lakes, and impoundments, the location of any discharge into any surface-water body in the proposed permit and adjacent areas, and information on surface-water quality and quantity sufficient to demonstrate seasonal variation and water usage. Water-quality descriptions shall include, at a minimum, baseline information on total suspended solids, total dissolved solids or specific conductance corrected to 25°C, pH, total iron, and total manganese. Baseline acidity and alkalinity information shall be provided if there is a potential for acid drainage from the proposed mining operation. Water-quantity descriptions shall include, at a minimum, baseline information on seasonal flow rates.
- (3) Supplemental information. If the determination of the probable hydrologic consequences (PHC) indicates that adverse impacts on or off the proposed permit area may occur to the hydrologic balance, or that acid-forming or toxic-forming material is present that may result in the contamination of ground-water or surface-water supplies, then supplemental information shall be provided to evaluate such probable hydrologic consequences and to plan remedial and reclamation activities. Such supplemental information may be based upon drilling, aquifer tests, hydrogeologic analysis of the water-bearing strata, flood flows, or analysis of other water-quality or quantity characteristics.

Baseline cumulative impact area information.

- (1) Hydrologic and geologic information for the cumulative impact area necessary to assess the probable cumulative hydrologic impacts of the proposed operation and all anticipated mining on surface- and ground-water systems shall be provided if available from appropriate Federal or State agencies.
- (2) If this information is not available from such agencies, then the applicant may gather and submit this information as part of the permit application.
- (3) The permit shall not be approved until the necessary hydrologic and geologic information is available.

ENVIRONMENTAL RESOURCE INFORMATION

Modeling.

The use of modeling techniques, interpolation, or statistical techniques may be included as part of the permit application, but actual surface- and ground-water information may be required for each site even when such techniques are used.

Probable hydrologic consequences determination.

- 1.) The application shall contain a determination of the probable hydrologic consequences (PHC) of the proposed operation based upon the quality and quantity of surface and ground water under seasonal flow conditions for the proposed permit and adjacent areas.
- 2.) The PHC determination shall be based on baseline hydrologic, geologic, and other information collected for the permit application and may include data statistically representative of the site.
- 3.) The PHC determination shall include findings on: whether adverse impacts may occur to the hydrologic balance; whether acid-forming or toxic-forming materials are present that could result in the contamination of surface or ground-water supplies; what impact the proposed operation will have on: sediment yield from the disturbed area; acidity, total suspended and dissolved solids, and other important water quality parameters of local impact; flooding or streamflow alteration; ground-water and surface-water availability; and other characteristics as required.
- 4.) An application for a permit revision shall be reviewed by the Division to determine whether a new or updated PHC shall be required.

Ground-water monitoring plan

- 1.) The application shall include a ground-water monitoring plan based upon the PHC determination and the analysis of all baseline hydrologic, geologic, and other information in the permit application. The plan shall provide for the monitoring of parameters that relate to the suitability of the ground water for current and approved postmining land uses and to the objectives for protection of the hydrologic balance. It shall identify the quantity and quality parameters to be monitored, sampling frequency, and site locations. It shall describe how the data may be used to determine the impacts of the operation upon the hydrologic balance. At a minimum, total dissolved solids or specific conductance corrected to 25°C, pH, total iron, total manganese, and water levels shall be monitored and data submitted to the Division at least every 3 months for each monitoring location. The Division may require additional monitoring.
- 2.) If an applicant can demonstrate by the use of the PHC determination and other available information that a particular water-bearing stratum in the proposed permit and adjacent areas is not one which serves as an aquifer which significantly ensures the hydrologic balance within the cumulative impact area, then monitoring of that stratum may be waived by the Division.

Surface-water monitoring plan.

- 1.) The application shall include a surface-water monitoring plan based upon the PHC determination and the analysis of all baseline hydrologic, geologic, and other information in the permit application. The plan shall provide for the monitoring of parameters that relate to the suitability of the surface water for current and approved postmining land uses and to the objectives for protection of the hydrologic balance, as well as the effluent limitations found at 40 CFR Part 434.
- 2.) The plan shall identify the surface-water quantity and quality parameters to be monitored, sampling frequency, and site locations. It shall describe how the data may be used to determine the impacts of the operation upon the hydrologic balance. At all monitoring locations in streams, lakes, and impoundments that are potentially impacted or into which water will be discharged and at upstream monitoring locations, the total dissolved solids or specific conductance corrected to 25°C, total suspended solids, pH, total iron, total manganese, and flow shall be monitored. For point-source discharges, monitoring shall be conducted in accordance with 40 CFR Parts 122, 123, and 434 and as required by the National Pollutant Discharge Elimination System permitting authority.
- 3.) The monitoring reports shall be submitted to the Division every 3 months. The Division may require additional monitoring.

Analysis:

On December 14, 2001, the Board of Oil, Gas and Mining remanded the Division's decision to issue the permit for the Lila Canyon Permit Application on the basis that the Board believed the administrative record was lacking in baseline hydrology data. The following discussion and analysis have been clarified to demonstrate that these requirements have been met.

Sampling and analysis

The Permittee has submitted data available from previous studies and reports to establish a ground water inventory of 83 seeps and springs in and adjacent to the permit area. The Division considered 53 of those seeps and springs pertinent to the permit area. The other 30 springs were looked at, but were not considered because they have been undermined or are at a considerable distance from the permit area. Springs emanate only from the Wasatch Group consisting of the Colton Formation and undifferentiated North Horn Formation-Flagstaff Limestone. This is the only aquifer associated with the Lila Canyon permit area. The data and information is sufficient to allow characterization of seasonal differences in flow, water quality values, and types of impacts that can be incurred. The Permittee submitted data on selected springs; L-6-G (B# 005558, 005542); L-7-G (B# 005559, 005462); L-8-G (B# 005560, 005566); L-9-G (B# 005561, 005504); and L-10-G (B# 005562, 005492). The data for these springs can be seen in Table A at the end of the document. Inventory data which reflects the groundwater hydrology baseline conditions and water tables (Plate 7-1, B# 005659) was also submitted in Appendices 7-1 (B# 005427) and 7-2 (B# 005464). Representative spring samples taken from the inventory list are being monitored for quality and quantity and will continue at all sites until bond release through the operational and reclamation period.

No water discharges to the surface from the Mesa Verde Group, consisting of the Blackhawk Formation (this contains the coal seams), Castlegate Sandstone, and Price River Formation in the Lila Canyon lease areas. Water levels taken via piezometers in the main coal seam show a hydraulic head indicating a perched water zone. This perched water zone is not an aquifer because it has no use. It has no use because it does not discharge to the surface as noted prior.

Baseline samples collected in 1993, 1994, and 1995 (Appendix 7-6, B# 005807 to 005997) were analyzed using the methods in Standard Methods or 40 CFR 136. The Permittee commits that all water-quality analyses performed to meet the requirements of R645-301-723 through -724.300, -724.500, -725 through -731, and -731.210 through -731.223 will be conducted according to the methodology in the current edition of "Standard Methods for the Examination of Water and Wastewater" or the methodology in 40 CFR Parts 136 and 434. Water-quality sampling will be conducted according to either methodology listed above when feasible (Section 723, B# 005340).

Baseline Information

The proposed Lila Canyon Mine will be an underground mine with a facilities pad approximately 49 acres in area. Only 28 acres will actually be disturbed for mine site facilities and roads. The other 21 acres may eventually be used during the mining interim. Any changes will require an amendment to the mine plan. Runoff from the disturbed minesite will be controlled by a system of ditches and culverts and sediment structures which will convey and capture runoff and sediment to a sediment pond for treatment prior to any discharge.

Division guidelines help ensure that information is collected to allow the hydrologist to characterize the hydrologic regime. The guidelines are not rules, and therefore, they can be modified as long as the Coal Rules are met. The rule calls for data... "sufficient to demonstrate seasonal variation." (R645-301-724.200) UEI has assembled and presented baseline data in the MRP, as

ENVIRONMENTAL RESOURCE INFORMATION

shown below. The MRP is reviewed in combination with other geological and hydrological surveys and studies of the areas within and adjacent to the proposed Lila Canyon permit area to characterize the hydrologic regime. It is a common practice for hydrologists to research all available data sources to identify the occurrence, nature, and trends of water resources as they relate to geologic and surface areas on and off the minesite. Older data and newer data are used in combination to characterize the hydrologic regime both locally and regionally.

A water monitoring plan was developed to assess the ground- and surface water levels and flows. Intermittent and ephemeral drainages in the area flow in response to rapid snow melt and excessive precipitation events. The proposed surface-water monitoring program will monitor the surface-water and ground-water resources, including drainages above and below the disturbed mine site area, and all point-source discharges (i.e. sediment pond). The monitoring plan will provide data to show impacts to potentially-affected springs, seeps, impoundments and drainages within and adjacent to the permit area, by comparison with relevant baseline data and with applicable effluent limitations.

Within and adjacent to the permit area, the surface-water resources consist of three main drainages ²: Horse Canyon Creek, Little Park Wash and an unnamed wash in Lila Canyon, all intermittent channels. Horse Canyon flows to Icelander Wash which, in turn, flows to Grassy Trail Creek and the Price River. Little Park Wash flows southward to Trail Canyon and the Price River. Lila Canyon drains southwest to Grassy Wash, then south to the Marsh Flat Wash and the Price River. (See Plate 7-1)

Generally, the upper sections of Horse Canyon; Little Park Wash and Lila Canyon flow during the spring snowmelt runoff period and also as a result of summer thunderstorms. Some drier years may produce no runoff in these washes at snowmelt. Due to the limited drainage area and elevation of Lila Canyon, the duration of the snowmelt flows is quite short and is limited to early spring. Locations of all baseline data points are shown on Plate 7-1 (B# 005659). Baseline data information is included in Appendix 7-1 (B# 005426 to 005562). There are no perennial streams, lakes, ponds or irrigation ditches known to exist within the Lila Canyon permit area. Usually no flow is evident in Horse Canyon Creek by late spring or early summer, or at Lila Canyon and Park Wash.

Ground-water Information

There are baseline data collected at various dates for many springs in the area, and baseline data were obtained by IPA in 1993, 1994, 1995, and 1995 6 for the piezometers wells and springs that are also proposed for operational ground-water monitoring. ~~Additional data were requested because there was a hiatus in monitoring after 1996. Monitoring resumed in July 2000 and data are included through May 2001.~~

² Many of the streams on the proposed permit area are defined hydrologically as ephemeral, however the Coal Regulations consider any water shed over a square mile as intermittent.

The groundwater regime in the Lila Canyon Lease area consists of two different multi-layered zones. The upper zone, or Wasatch Group, consists of the Colton Formation and undifferentiated Flagstaff Limestone-North Horn Formation. Parts of it are classified as an aquifer, because different perched layers supply limited groundwater sources in sufficient quantities for a specific use as specified by R-645-100-200 (definition of "Aquifer"). The uses have been established for cattle and wildlife. The Wasatch Group covers the eastern half of the Lila Canyon Extension area where it dips a little north of east. It produces low volume spring flows. Some of the spring discharges have been developed in this shallow zone and are used to supply water for livestock during the summer months. It is assumed that the water is also used by wildlife.

The Mesa Verde Group consists of the Blackhawk Formation (where the coal seams are located), Castlegate Sandstone and the Price River Formation. No formation or unit in the Mesa Verde Group is considered an aquifer as defined by R645-100-200, since it is not developed for a specific use, nor does it supply any water sources. It has no observable discharge points within the Lila Canyon Mine Extension area or down dip from that area. It does not discharge along any faults or fractures or adjacent canyons. Any storage in the perched zones is contained by the impermeable undifferentiated North Horn Formation-Flagstaff Limestone above and the impermeable Mancos Shale below. Though it underlies the upper perched aquifer zone, they are separated by the undifferentiated North Horn-Flagstaff formations which contain approximately 80 percent clays, siltstones, mudstones, and shales, all highly restrictive to groundwater movement.

Groundwater movement within the Mesa Verde Group is also restricted by multiple interbedded shale and siltstone layers within the Blackhawk Formation. Hydraulic conductivities indicate very low vertical movement within the upper Mesa Verde Group. Piezometers IPA-1, IPA-2, and IPA-3 drilled into the coal seam yield a measured water level revealing a hydrostatic head in the coal zone.

The upper Mesa Verde Group is likely saturated in the perched zones, though saturation does not mean the groundwater is readily available. The texture of the formations and beds range from a medium course sandstone to a very fine mudstone. Movement and storage is related to porosity and permeability of the beds. Lateral movement of groundwater is more likely than vertical movement, however any movement is very very slow considering the tightness of the beds and that no discharge is occurring.

Springs that appear on and adjacent to the area are associated with the lower Colton Formation and very upper North Horn Formation. There is a paucity of springs and seeps within the permit area. Most springs and seeps appear above the escarpment outside the permit area. Only Redden Spring, RS-2, flows from the Mesa Verde Group, it appear to flow from below a sandstone unit of the Price River Formation. It is part of the Horse Canyon Mine and separate from the Lila Canyon lease. RS-2 discharges approximately 10 gpm at the base of a sandstone outcrop above the lower Sunnyside coal seam.

The Horse Canyon Mine is developed in the same lower Blackhawk Formation, it does not

ENVIRONMENTAL RESOURCE INFORMATION

currently discharge groundwater. The Horse Canyon MRP shows that water was intercepted in the mine and pumped outside the mine where it was discharged to a storage tank, sedimentation pond or the creek. Water stored in a water tank was used in the bathhouse for showering.

Potential groundwater quality for the coal zone was evaluated from information garnered from Waddell 1982 Hydrologic Data Report No. 38, two water quality samples (Bates No. 6470) in the ~~from~~ Horse Canyon Mine. Analyses show high alkalinity and slightly higher pH than average.

Water levels in the coal zone were monitored by piezometers, boreholes IPA-1, IPA-2 and IPA-3, (B# 005551) during various periods from July 1994 to Present. The data does not have to be collected the two years prior to mining to identify comparative levels. The intent of collecting data is to characterize the hydrologic regime. The water levels in the coal zone provide the information need, which identifies if water is stored in this zone which may have to be discharged during mining. The Blackhawk Formation is not an aquifer and does not have to meet the definition or monitoring requirements of an aquifer. There are no discharges from the coal zone or upper Mesa Verde group, thus the water levels collected which are shown in tabular form are adequate to identify the head and extent of the water in the coal zone. The initial monitoring levels conducted in 1994 and 1995 are valid baseline data. The newer data collected in 2001 show that there has been relatively little fluctuation in IPA-2 and IPA-3 as compared to levels collected in 1994-95. The level in IPA-1 shows an increase in head of nearly 20 feet.

Additional baseline data for these piezometers and springs were obtained beginning in July 2000. Appendix 7-1 (B# 005426 to 005562) of the permit application includes a report of a water-level measurement at IPA-2 in December 2000. The springs were monitored again in July and November 2000 and February 2001 but the reports indicate either "no flow" or "no access." Because of inconsistencies in the July data, UEI decided not to include them in the final submittal (letter dated June 26, 2001, B# 000121).

Based on the Division's review of all available data, the hydrologic characteristics of the permit and adjacent areas have been determined and existing baseline data are considered sufficient to approve the permit.

Seeps and springs

There is a paucity of springs and seeps within the permit area. Most springs and seeps appear above the escarpment. Only Redden Spring (RS-2+) and another spring (RS-12) flow in Horse Canyon. RS-2 discharges approximately 10 gpm from a sandstone unit above the coal seams. Williams Draw (L-10-G) south of the permit area exhibits the highest amount of flow. In an average water year the flow is perennial and a spring has been developed supplying a watering trough for cattle and wildlife. Springs and potential mine water discharge will be monitored in accordance with the Ground Water Monitoring Plan in Chapter 7 throughout the operation and reclamation phases.

The Permittee states in Section 722.200 (B# 005338) that ~~E~~ locations of all confirmed seeps and springs are shown on Plate 7-1 (B# 005659 Section 722.200). ~~There were several springs~~

~~located in earlier surveys but their locations could not be confirmed. The various names, dates or types of data that are in the appendices are tabulated in Table 1 below. In addition, Redden Spring, RS-2 has been monitored under the Horse Canyon MRP since 1981; except for a gap from 1983 through 1988. These data are in the DOGM Electronic Data Base. numbers used to identify springs and seeps are sometimes different in Appendices 7-1, 7-2, and 7-6 and on the maps. The various names, dates, and types of data were tabulated and are shown in Table 1 of this Technical Analysis.~~

JBR Consultants Group conducted a seep and spring survey of the Horse Canyon area in 1985. Table 7-1 (B# 005344) in the Lila Canyon Permit Application ~~plan~~ contains flow, pH, conductivity, and temperature data for nineteen seeps and springs: H-1 through H-11, H-13, H-14, H-18 through H-22, and H-92. Laboratory report sheets for H-1 (RB-21), H-6 (RB-26), H-18 (EWL-25), and H-21 (EWL-26) for November 1985 are in Appendix 7-6 (B# 005808 to 005811).

Springs identified by JBR Consultants Group as HC-1A, H-18A, H-18B, H-21A, and H-21B and an unidentified spring 1,000 feet southwest of HCSW-2 were shown on a preliminary Plate 7-1 but were not listed or discussed in the Lila Canyon Permit Extension. The Permittee states that no sample data or pertinent information are available for these sites, so they are no longer on Plate 7-1 (page 12 of Section 724.100; Bates 005364).

Appendices 7-1 and 7-6 contain seasonal information on ground-water quality and flow for seeps and springs 1 (S-1), 9 (S-9), 10 (S-10), 14 (S-14), 16 (S-16, 16Z), HC-2 (H-2), HC-4 (H-4), HC-9 (H-9), HC-11 (H-11), HC-13 (H-13), HC-14 (H-14), and HC-18 (H-18). Data are from work done in 1993, 1994, and 1995 by EarthFax Engineering for IPA. Water-quality parameters required by the Utah Coal Mining Rules, which are total dissolved solids (TDS) or specific conductance corrected to 25 degrees C°, pH, total iron, and total manganese were determined. Other parameters listed in Division of Oil, Gas and Mining (DOGM) Directive Tech 004 were analyzed in these samples, except that total metals rather than dissolved metals concentrations were determined.

EarthFax also identified springs and seeps 1A, 1B, 2, 3, 3A, 3B, 3C, 3D, 4, 5, 6, 7, 8, 8A, 8B, 9R, 10A, 11, 12, 12A, 12B, 12C, 12D, 12E, 13, 13A, 13B, 13Z, 14A, 15, 15A, 15B, 15C, 16A, 16B, 16C, 17, 17A, 17B, 18, 19A, 19B, 19C, 20, and 22. These were dry or had low flows at the time of the quarterly visits and no water-quality analyses were done (Appendix 7-1, B# 005426 to 005550). 8B, 15A, 17B, and 19C could neither be found on Plate 7-1 (B# 005659) nor matched with another identified seep or spring: ~~these and several other sites that are mentioned in earlier documents but for which no sample data or pertinent information are available are not on plate 7-1 (Page 12 of Section 724.100; B# 005364).~~

RS-2 (Redden Spring) was monitored ~~RS-1 and RS-2 were sampled~~ once a year during 1978; and 1979, and twice in 1980. Except for the second sample in 1980, water samples were ~~and~~ analyzed for most major chemical constituents. Data are in Appendix VI-1 of the current Horse Canyon Mine MRP (B# 003551). From 1981 to 1984, minimum required parameters were determined by the mine operator, Geneva Steel (Appendix 7-2; Bates 005563-005645). Under the Horse Canyon MRP, RS-2 has been monitored regularly since 1989: these data have been reported to the Division and are in the DOGM Electronic Database. The nearby site identified as spring RS-1

ENVIRONMENTAL RESOURCE INFORMATION

is often dry and has not been monitored regularly, but a water sample was analyzed in 1978 (Appendix VI-1 of the current Horse Canyon Mine MRP; Bates 003550).

Water rights are listed in Table 7-2 (B# 005355 to 005357). Uses are stockwatering, domestic, mining, and "other". The list includes Redden Spring plus springs identified as Mont, Leslie, Cottonwood, Williams, and Kenna. There are two Pine Springs listed, at different locations and with separate water rights. In addition there are eleven unnamed or otherwise unidentified springs listed, plus three water rights on "underground tunnels". Locations of water rights are on Plate 7-3 (B# 005661), and some of the locations on Plate 7-3 correspond roughly with springs shown on Plate 7-1 (B# 005659). A water right for the MDC well is listed in Table 7-2, but information in Sections 6.5.1 and 722.400 (B# 005339) of the Lila Canyon Permit Application plan indicates this was a water monitoring well that has been abandoned and, to the best of the Permittee's knowledge, plugged.

A water-monitoring program was implemented in July 2000 to determine if the springs proposed for operational monitoring were still viable and to establish a current baseline that would be continuous with operational monitoring (page 30, Chapter 7, B# 005363): because of confusion in identifying the spring sites in July 2000, UEI has marked the July 2000 spring data as "not sampled" (letter dated June 26, 2001 and final version of Appendix 7-1, B# 000121, 005558 to 005562). L-6-G (H-18), L-7-G (9, S-9), L-8-G (10, S10), L-9-G (16, 16Z, S-16), and L-10-G (14, S14) were prescribed to be successfully monitored in November 2000 and February, June and July 2001.. Dry conditions in July led to "no flows" being reported for all sites. And, snow conditions did not allow the operator to gain access to the sites in November 2000 and February 2001.; Reports are in Appendix 7-1 (B# 005558 to 005562) of the proposed amendment Permit Application. Monitoring of springs continues on a quarterly basis.

Wells and boreholes

Kaiser Steel Company unsuccessfully attempted to convert boreholes S-26, S-28, and S-31, located south of the Williams Draw Fault, to ground-water observation wells in 1980: the cement seals failed and the casing filled with cement (Bates 006129 and 006136). Shallow offset piezometers A-26, A-28, and A-31 were installed to observe ground-water levels in the alluvium (Table 6-3; B# 005176): it is not clear from Table 6-3 whether or not these wells have been plugged and abandoned or if they are available for ground-water level monitoring; however, the permittee has no data from or information on these piezometers and considers them unusable (Section 724.100; B# 005346). Because of the age, lack of maintenance, and lack of data from these piezometers, the Division concurs that there is no useful information from them, but such information is not critical to the Division's findings.

Two other borings wells (Plate 7-1) were completed bored in Horse Canyon to monitor water in the alluvium (Section 6.5.1). UEI will attempt to use the Horse Canyon Well near the main Horse Canyon facilities (Plate 7-1, B# 005659) will be used during mining and reclamation operations and sealed it after reclamation is complete. To the Permittee's best knowledge, the MDC well (Table 7-2, B# 005355 to 005357) located near the road junction has already been sealed. There

are no logs or other geologic or hydrologic data for these wells in the Lila Canyon Permit Application.(Section 724.100, B# 005342).

S-32 was drilled in 1981 as an exploratory core-hole and completed as a piezometer in the Grassy Member of the Blackhawk Formation. It is located in SW/4 SE/4 Sec. 4, T. 17 S., R. 15 E. The Applicant considers S-32 unusable (Section 724.100; Bates 005346). Its exact location is not known. The Lila Canyon Permit Application contains no data on ground-water elevation or quality for S-32 and the Permittee states that other than the logs in Appendix 6-1 there are no geologic or piezometric data from S-32 (page 21 of Section 6.5.1; Bates 005177). However, the Kaiser Steel Company South Lease Supplemental Submission in DOGM's files (B# 006054 to 006343) contains additional information: this drill-hole was identified by Kaiser Steel Company as S-32, KSC-S-S-32-81, and WMH-3D. Water-levels were measured quarterly from August 1981 through December 1982, a pump test was done in December 1982, and water-quality samples were collected in November (bailed) and December (pumped) 1982 (pages VII-23 - VII-36; Bates 006189-006196). The Permittee considers S-32 unusable (Section 724.100).

In 1993 and 1994, IPA-1, IPA-2, and IPA-3 (Plate 7-1, B# 005659) were drilled as coal exploration holes in the South Lease, and subsequently converted to piezometers. Water levels were measured seasonally by IPA in 1994, 1995, and 1996 to provide baseline water level data (Appendix 7-1, B# 005551) for the coal seam and adjacent strata in the proposed permit area. Holes Wells this deep are very difficult to sample for water quality and are only intended to measure water levels. Water quality ~~has not been determined for these wells~~ samples were not collected from these piezometers. Ground water measured by these piezometers does not represent an underground source of water used within the proposed permit or adjacent areas for domestic, agricultural, industrial or other legitimate purpose, including the suitability for existing premining uses and approved postmining land uses. The planned mining within this saturated zone will cause minimal disturbance, if any, to the hydrologic balance within the permit and adjacent areas and will not cause material damage to the hydrologic balance outside the permit area. Therefore, the ground water measured by these piezometers is not an "aquifer" as defined in the Coal Mining Rules.-

UEI implemented ~~Aa~~ water-monitoring program ~~was implemented~~ in ~~December~~ July 2000 to determine if the piezometers wells and springs proposed for operational monitoring were still viable and to establish a current baseline that would be continuous with operational monitoring (page 30, Chapter 7, B# 005363). In December 2000, UEI was able to measure the water level in IPA-2. The plan indicates that at IPA-1 and IPA-3 the probe was not able to go far enough ~~into the wells~~ to reach water. ~~These wells~~ All three piezometers were successfully measured on May 15, 2001 using a new 2,000 foot tape with a five-pound weight added below the probe tip; whatever had obstructed the two measurements in December 2000 appears to no longer be a problem.

The water levels taken on May 15, 2001 at IPA-2 and IPA-3 were within the range of depths measured in 1994 through 1996. The water level at IPA-1 was roughly 14 feet higher lower than the last measurement in 1996.; ~~however, water levels in IPA-1 were decreasing during the 1996 to 1998 monitoring period.~~ The reason for this increase decline is unknown. This

ENVIRONMENTAL RESOURCE INFORMATION

could potentially be related to water inflow to the old Horse Canyon Mine workings. IPA-1 and the old Horse Canyon Mine are separated from IPA-2 and IPA-3 by a fault.

Seeps, springs and potential mine water discharge will be monitored in accordance with the Ground Water Monitoring Plan in Chapter 7.

**Table 1. Names, dates, and data types of water monitoring.
GROUND-WATER MONITORING SITES**

Name		Appendix 7-2					Appendices 7-1 and 7-6					App 7-2	Water Right		
		1978 - 1980 (Geneva)	1981 - 1983 (Geneva)	1985 (JBR)	1989 (Kaiser)	1993 (EarthFax)		1994 (EarthFax)		1995 (EarthFax)				1997 Annual Report quarterly	(Spring Name)
Utah American Energy	JBR - EarthFax			Nov		May	Oct	May	Aug	Oct	May	Aug	Oct		
	JBR														
	HC-1A														
	H-1 (RB-21)			F, L											
	H(C)-2			F		F, L	F, L	F, L	F, L	F, L	F, L	F, L	F, L		
	H-3			F											
	H(C)-4			F			F, L	F, L	F, L	F, L	F, L	F, L	F, L		
	H-5			F											
	H-6 (RB-26)			F, L											
	H-7			F											
	H-8			F											
	H(C)-9			F			F, L	D							
	H-10			F											
	H(C)-11			F		F, L	F, L	F, L	F, L	F, L	F, L	F, L	F, L		91-1903
	H(C)-13			F		F, L	F, L	F, L	F, L	F, L	F, L	F, L	F, L		
	H(C)-14			F			L								
L-6-G*	H(C)-18 (EWL-25)			F, L		F, L	W	S			F, L	F, L	F, L		91-618 (Mont) 91-617 (Leslie)
	H-18A														
	H-18B														
	H-19			F											
	H-20			F											
	H-21 (EWL-26)			F, L											
	H-21A														
	H-21B														
	H-22			F											
	H-92			S											
	EarthFax														
I*	(S-1)					F, L	F, L	F, L	F, L	D	F, L	F, L	F, L		

**Table 1. Names, dates, and data types of water monitoring.
GROUND-WATER MONITORING SITES**

Name		Appendix 7-2					Appendices 7-1 and 7-6										App 7-2	Water Right
Utah American Energy	JBR - EarthFax	1978 - 1980 (Geneva)	1981 - 1983 (Geneva)	1985 (JBR)	1989 (Kaiser)	1993 (EarthFax)		1994 (EarthFax)			1995 (EarthFax)				1997 Annual Report	(Spring Name)		
				Nov		May	Oct	May	Aug	Oct	May	Aug	Oct	1997 Annual Report				
	1A*					F	D	F	S	S	F	D	D	quarterly				
	1B*					S	D	S	D	D	W	W	W					
	2*								D	S	F	D	F					
	3*					F	F	F	D	S	F	F	F					
	3A*					F	F	F	D	D	F	D	D					
	3B*					F	F	F	D	D	F	F	F					
	3C*								D	S	S, F	F	F					
	3D*								D	S	F	F	F					
	4*					F	D	F	D	Flow	F	F	D					
	4A					F	F	F					D					
	5*					F	D	F	D	S	F	S	S					
	5A						D											
	6*					D	F	S	S	S			F					
	6A						D											
	7*					F	F	F	S	Flow	S	F	F					
	7A						F											
	8*					F	F	F	F	F	F	F	F					
	8A*					F	F	F	D	Flow	F	F	F					
	8B*						F		D									
L-7-G*	(S-9)					F, L	F, L	F, L	F, L	F	F, L	F, L	F, L		91-399 91-2537 91-2521 (Cottonwood)			
9R*																		
L-8-G*	(S-10)					F, L	F, L	F, L	F, L	F	F, L	F, L	F, L		91-808 91-2538			
10A*																		
11*						F	F	F	W		S, F	F	F					
12*											F	S	S					
12A*						F	F	F	F	F	F	F	F					
12B*						F	F	F	F	F	F	F	F					

**Table 1. Names, dates, and data types of water monitoring.
GROUND-WATER MONITORING SITES**

**F = Field parameters only, R = Required parameters only, L = Lab parameters - operational or baseline,
Flow = Flow only, D = Dry or no-flow, W = Reported as 'wet', S = Reported as 'seep'**

Name	Appendix 7-2						Appendices 7-1 and 7-6										App 7-2	Water Right
	JBR - EarthFax	1978 - 1980 (Geneva)	1981 - 1983 (Geneva)	1985 (JBR)	1989 (Kaiser)	1993 (EarthFax)	1994 (EarthFax)			1995 (EarthFax)			1997 Annual Report	(Spring Name)				
Utah American Energy				Nov		May	Oct	May	Aug	Oct	May	Aug	Oct	1997 Annual Report quarterly				
						F	F	F	W	F	F	S	S					
						F	F	S	D	F	S, F		D					
								F	S	S	F	W	F					
						F	F	F	W, L	F	F	W	F					
						F	D		D	D	D	D	F					
						F	F	F	W	S	F	W	F					
						F	F	S	W	S	F	W	F					
						F, L	F, L	F, L	F, L	F	F, L	F, L	F, L		91-809			
L-10-G															91-2535			
						F	D	D	D	S	D	W	W					
						F	D	D	D	D	W	D	D					
						F	F	F	W	F	F	W	W					
						F	S	D	D	S	D	D	D					
						S	S	S	D	D	D	W	D					
						S, L	F, L	F	F	F, L	F, L	F, L	F, L		91-2539 (Pine)			
L-9-G						F	F	F, L	D	D	D	D	D					
						F	F	F, L	D	D	D	D	D					
						F	D	D	D	D	D	D	F					
						S	D	D	D	D	F	D	S					
						F	F	F	W	F	F	S	S					
						F	D	S	D	D	W	S	S					
						F			D									
						F	D	F	W	F	F	F	S					
							F											
						F	F	F	D	S	F	S	W					
						F	F	F	D	F	F	F	F					
						F	F	F	D	D	F	D	F					
						F	D	S	S	F	S	W	D					

**Table 1. Names, dates, and data types of water monitoring.
GROUND-WATER MONITORING SITES**

**F = Field parameters only, R = Required parameters only, L = Lab parameters - operational or baseline,
Flow = Flow only, D = Dry or no-flow, W = Reported as 'wet', S = Reported as 'seep'**

Name	Appendix 7-2					Appendices 7-1 and 7-6								App 7-2	Water Right (Spring Name)	
	JBR - EarthFax	1981 - 1983 (Geneva)	1978 - 1980 (Geneva)	1985 (JBR)	1989 (Kaiser)	1993 (EarthFax)		1994 (EarthFax)		1995 (EarthFax)		1997 Annual Report				
Utah American Energy				Nov		D	F	W	D							
22*																
RS-1			L (1978 only)													91-4959? Redden
RS-2*			L													91-4959 (Redden)
																91-810
																91-2517
																91-2518 (Williams)
																91-2519

* Springs Evaluated for Baseline Information.

SURFACE-WATER MONITORING SITES

Name	Appendix 7-2				Appendices 7-1 and 7-6						App 7-2 1997 Annual Report	Water Right (Spring Name)	
	1978 - 1980 (Geneva)	1981 - 1983 (Geneva)	1985 (JBR)	1989 (Kaiser)	1993 (EarthFax)		1994 (EarthFax)		1995 (EarthFax)				
Utah America n Energy			Nov		May	Oct	May	Aug	Oct	May	Aug	Oct	
HCSW-1 (HSW-1) (HC-1)	R			L			F, L	F, L	F, L	F, L			F, L
HCSW-2							D		D				
HCSW-3							D		D				
HCSW-4													
B-1 (HC-2)				D									D
BE-1													F, L

Name	1994		1995		1996		2001	
	July	Aug	May	Aug	April	May	Wtr Level	Wtr Level
IPA-1	Wtr Level							
IPA-2	Wtr Level							
IPA-3	Wtr Level							

ENVIRONMENTAL RESOURCE INFORMATION

Surface-Water Information

The Permittee has collected surface- and ground-water information over and adjacent to the proposed mining area and prepared a scenario of the PHC (Appendix 7-3). The Division makes an assessment of the cumulative impacts of coal mining on water resources in the Cumulative Hydrologic Impact Assessment (CHIA).

The surface water drainages within the Lila Canyon permit area, consist of three channels; Little Park Wash, and Lila Canyon Wash (North Fork of Coleman Wash) and the South Fork of Coleman Wash. Little Park Wash trends southward to Trail Canyon and the Price River. It runs across the Colton Formation and undifferentiated North Horn-Flagstaff formations in the upper reaches of the channel and across the mine permit area above the Book Cliffs. The drainages flow only in response to snowmelt during the spring or as a result of isolated summer thunderstorms. Due to the limited drainage area and elevation of Lila Canyon, the duration of the snowmelt flows is quite short and limited to the very early spring. Locations of all baseline monitoring sites are shown on Plate 7-1, (B# 00659). There are no streams, lakes or ponds or irrigation ditches known to exist within the proposed Lila Canyon permit area. Lila Canyon Wash and the South Fork of Coleman Wash drain southwest to Grassy Wash. It in turn drains southward to the Price River. (See Plate 7-1, B# 005659)

Within and adjacent to the permit area, surface-water resources consist of three intermittent drainages: Horse Canyon Creek, Lila Canyon channel, and Little Park Wash (Section 724.200). These channels function as ephemeral, but are regarded as intermittent as identified under Section R645-100-200 of the coal regulations, because they have a drainage area greater than one square mile. The south fork of Coleman wash runs along the south side of the disturbed area and is considered ephemeral. The Permittee states in Section 722.200 that the location of all known seeps and springs, as well as watering ponds or tanks are shown on Plate 7-1 (B# 005659); however, there are no watering ponds and DOGM is not aware of any in the area. The Permittee states that there are no streams, lakes or ponds, or irrigation ditches known to exist within the proposed permit or adjacent areas (Section 722.200): there are no perennial streams, but intermittent and ephemeral streams are shown on Plate 7-1.

Regulation R645-100, identifies a **perennial stream** as a "stream that flows continuously during all the calendar year as a result of groundwater discharge or surface runoff." There are no perennial streams on or immediately adjacent to the permit area. An **intermittent stream** is defined as "(a) a stream or reach of stream that drains a watershed of at least one square mile. or (b) a stream, or reach of a stream, that is below the water table for at least part of the year and obtains its flow from both surface runoff and groundwater discharge. An **ephemeral stream** is defined as, "a stream which flows only in direct response to precipitation in the immediate watershed or in response to melting of a cover of snow and ice and which has a channel bottom always above the local water table.

The Applicant states in Section 724.200 of the PAP (B# 005347) that because of the distance from the proposed Lila Canyon Mine, there has been no collection of baseline data from Range Creek. The Division, in its decision not to require monitoring of this stream, also evaluated the elevation difference between Range Creek and the saturated zone in the Blackhawk Formation - especially in the reaches nearest the permit area; roughly five- and one-half miles east of IPA-1 (the piezometer nearest Range Creek) is at the same elevation as the water levels in the piezometers. Upstream from that point the

ENVIRONMENTAL RESOURCES INFORMATION

elevation of Range Creek increases rapidly. At the nearest poing, 4 and one-half miles northeast of IPA-1, Range Creek is 600 feet higher than the water in the piezometer (see figure 1 at the end of the document). The Division also considered the thick section, 1000 feet or more, of low-permeability strata between the Blackhawk and the Colton Formations (Section 724.200).

Range Creek drainage is the nearest perennial stream to the Horse Canyon Mine permit area. The nearest reach being approximately 3 miles to the east-northeast at an approximate elevation of 6,700 feet. Range Creek is in a broad, south-southeast oriented drainage that has been eroded into the Roan Cliffs. As a result the main body ~~It is approximately 6 miles east of the Lila Canyon permit area and separated from it by the drainage divide at the top~~ of the Roan Cliffs is to the east and a narrow western extension of the Roan Cliffs named Patmos Ridge lies between Range Creeek and the Book Cliffs. The Roan Cliffs were named for the characteristic color given them by the Colton Formation. The Colton Formation is exposed at the surface from Patmos Ridge east to the main body of the Roan Cliffs, and between these two escarpments Range Creek has eroded into but not through the Colton. Approximately eleven miles southeast of the permit area, just upstream of Turtle Canyon, Range Creek has eroded through the Colton, Flagstaff, and North Horn Formations, but it reaches the Green River without having eroded through the Upper Price River Formation. (The nearest Blackhawk outcrop is 10 miles south, along the Price River in the canyon between the Book Cliffs and the Beckwith Plateau.) ~~Because of the distance from the proposed Horse Canyon Mine, the Division has not required collection of baseline hydrologic baseline data from Range Creek.~~

The upper reaches of Lila Canyon channel and Little Park Wash begin in the Book eCliffs escarpment, about 1000 feet in elevation above the proposed surface facilities.

The main drainage through the permit area, Little Park Wash, is described briefly in Section 724.200 and in Table 7-2 (B# 005355 to 005357). There was "no flow" during observations done at least quarterly in 1999 and 2000 (Section 724.200, B# 005348), so no samples were collected for water quality analyses. Spring flows in this drainage evaporate or infiltrate into the alluvium before reaching the main channel. Channel flow most likely occurs only when there are large thunderstorms or rapid snowmelt, and may not occur every year. Kaiser Steel Company had crest stage gauges (CSG) on Little Park Wash, just above and below Williams Draw, and in Williams Draw from third-quarter 1981 to fourth-quarter 1982 (Section 6.5.1 and page VII-84; B# 005177, 006222 Note: Williams Draw is one to two miles south of the Lila permit area boundary). PHDI data (B# 006449) indicate the period from late 1981 through 1982 trended from dry to wet, while the period of 1999 through 2001 trended from wet to dry. ~~runs from northwest to southeast and forms the main drainage through the escarpment over the permit area. No runoff flow was observed in the channel 1998, 1999, and 2000, thus no water-quality data was collected for the main channel in Little Park Wash. A dirt road runs parallel to the channel on part of the permit so access to observe the channel is good.~~

<i>Kaiser Steel Company Crest Stage Gauges</i>	<i>CSG-1 In Little Park Wash Above Williams Draw</i>	<i>CSG-2 in Little Park Wash Below Williams Draw</i>	<i>CSG-3 In Williams Draw</i>
33 rd Qtr 1981	2 feet	2 feet	none

ENVIRONMENTAL RESOURCE INFORMATION

4 th Qtr 1981	none	20 inches	20 inches
1 st Qtr 1982	Inaccessible, weather	Inaccessible, weather	Inaccessible, weather
2 nd Qtr 1982	None	None	None
3 rd Qtr 1982	<0.5 feet	>0.5 feet	None
4 th Qtr 1982	None	None	None

There appear to be a few springs in each of the ~~smaller tributaries to the~~ larger draws, which are tributary channels to ~~Lila Canyon and~~ Little Park Wash. The springs are associated with sandstone outcrops of the Colton Formation, and their source appears near the channel. ~~Most of the flow emanates near the channel.~~ Long use of the area for cattle is evident, because some of the higher flowing springs have been developed and have troughs placed near the channel to collect flows for watering.

Typically, the spring flow is not large. Some springs flow only a few tenths of a gallon per minute, some of the larger springs flow from 2 to 8 gallons per minute in the spring and 1 to 5 gallons per minute in mid-summer. The springs flow down the channel for a distance of 50 to 100 feet before they seep into the alluvium. Sometimes part of the flow reappears when the alluvium thins and bedrock forms the channel bottom. Channel flow occurs only when there are heavy rains from thunderstorms or rapid snowmelt.

~~Little Park Wash and Lila Canyon Wash meet the classification for intermittent stream because they are over one square mile in area. These washes also meet the classification for ephemeral stream channels, which flow in direct response to precipitation. The Division believes that these two drainages are best defined as ephemeral because these are characteristically dry. The operator states on page 14, MRP, B#005348, both Lila Canyon Wash and Little Park Wash have been observed numerous times, July 1999 to July 2001, at least quarterly for the past two years and no flow was noted.~~

~~The Permittee submitted data on 47 springs in the Colton Formation and undifferentiated North Horn Formation-Flagstaff Limestone and is monitoring, L-6-G (B# 005558, 005542); L-7-G (B# 005559, 005462); L-8-G (B# 005560, 005566); L-9-G (B# 005561, 005504) and L-10-G (B# 005562, 005492); (see Table A at the end of this document) which reflects the groundwater hydrology baseline conditions and water table above the stream channel for each perched aquifer(upper groundwater zone). The springs generally flow in the upper small reaches at low rates, which wet the upper reaches of the stream channel for less than a hundred feet. During most of the summer and fall the main channels down gradient of the springs are dry.~~

~~The type of stream channel is important in evaluating and predicting the types of impacts induced by mining, and whether reclamation, if the stream channel is disrupted, is feasible. The types of impacts from mining that could affect Little Park Wash and Lila Canyon Wash could be water quality degradation. Only Little Park Wash has the potential of being affected by subsidence, Lila Canyon Wash has already been mined under by the Horse Canyon Mine (Plate 5-1, MRP). Subsidence can be allowed within 100 feet of an intermittent stream if renewable resource lands are not impacted, R645-301-525. The permit application included a survey which shows whether structures and renewable resource lands~~

exist within the proposed permit area and adjacent area and whether subsidence, if it occurred, could cause material damage and diminution of reasonably foreseeable use of such structures or renewable resource lands.

For the purposes of R645-103, RENEWABLE RESOURCE LANDS means geographic areas which contribute significantly to the long-range productivity of water supply or of food or fiber products, such lands to include aquifers and aquifer recharge areas

Regulation R645-301-731-600 provides that the Division can make a findings to allow mining under an intermittent steam channel if :

- 731.600. Stream Buffer Zones.
- 731.610. No land within 100 feet of a perennial stream or an intermittent stream will be disturbed by coal mining and reclamation operations, unless the Division specifically authorizes coal mining and reclamation operations closer to, or through, such a stream. The Division may authorize such activities only upon finding that:
- 731.611. Coal mining and reclamation operations will not cause or contribute to the violation of applicable Utah or federal water quality standards and will not adversely affect the water quantity and quality or other environmental resources of the stream; and
- 731.612. If there will be a temporary or permanent stream channel diversion, it will comply with R645-301-742.300.
- 731.620. The area not to be disturbed will be designated as a buffer zone, and the operator will mark it as specified in R645-301-521.260.

In identifying whether impacts could affect the intermittent stream channels, it was evaluated whether the channels themselves are renewable resources. The definition of Renewable Resource Lands identifies the springs emanating from the Colton aquifer are renewable resources and should be protected as the regulation allow. These particular channels do not contain a fishery or support aquatic life in the main channels. The main channels do not support riparian vegetation, the only riparian vegetation is near spring sources that supply the upper reaches for short distances. Stream channels are dynamic and are moving and adjusting to changes in the environment. The channel which directs the ephemeral type flows is a significant feature, but is not a renewable resource. Modifications to the channel could occur if the water resources are not impacted and adverse impacts to the channel could be mitigated. If any parts of the main channel were subsided, it can be mitigated. It is unlikely that water interception could occur, because the cover between the coal seam and the surface is extensive enough to prevent substantial deformation or fracturing.

Geologic information presented in the MRP shows that the overlying strata thickness between the coal seam and Little Park Wash ranges between 700 feet at the southern most mined area to 2500 feet to the north of the permit area. The overlying strata contains multiple interbedded sandstone and shale layers, yet the cover ranges from 700 feet at the cross cut to 1000 feet over the mine panel (Plate 5-3, MRP). The high amounts of clays, siltstones and mudstones in the layers below the channel alluvium

ENVIRONMENTAL RESOURCE INFORMATION

would prevent or seal any potential fractures. The flow in the stream channels are zero to high; the high flows would carry high volumes of sediment that would fill any subsidence fractures. If subsidence should occur, temporary ponding could take place. UEI can mitigate if it is found necessary. Ponding although not expected, could provide a beneficial use water source to wildlife if it happens.

The potential for water quality impacts is not likely in any of the channels. No disturbance will take place adjacent to Little Park Wash. Although flows have not been sampled several USGS reports show that high volumes of runoff from adjacent areas contain high volumes of suspended and dissolved sediments, Waddell, 1981, USGS Professional Paper 2068. The applicant has provided information in the MRP to show that runoff from the disturbed area and any potential mine discharges will meet water quality standards (as discussed in other sections).

It is the determination of the Division that subsidence will not impact any stream channels and that the applicant may conduct mining operations within 100 feet of the channels of Little Park Wash and Lila Canyon Wash (North Fork of Coleman Wash).

Williams Draw just south of the permit area exhibits the highest amount of flow from spring sources. In an average water year flow in the channel is perennial. The spring has been developed supplying a watering trough for cattle and wildlife. Springs and potential mine water discharge will be monitored in accordance with the Ground Water Monitoring Plan in Chapter 7 throughout the operation and reclamation phases.

It states in Section 724.200 of the PAP that flows in Horse Canyon are limited to the early spring period (Lines and Plantz, 1981). By late spring to early summer, there is ~~usually no flow is evident in Horse Canyon Creek by late spring to early summer~~ below the mine site or in Lila Canyon Creek (B# 005347). ~~Flow monitored in the valley at B-1 (or HC-2) in 1989 was intermittent (Appendix 7-2).~~

Water-quality and quantity data for Horse Canyon surface-water monitoring points HCSW-1 (HSW-1, HC-1), HCSW-2, HCSW-3, B-1 (HC-2), and RF-1 are identified in Appendices 7-1, 7-2, and 7-6. ~~Data in Appendices 7-1 and 7-6 show HCSW-2 and HCSW-3 were dry when monitored in 1994 and 1995. Baseline data from 1981 through 1983 for the Horse Canyon Mine's Utah Pollutant Discharge Elimination System (UPDES) discharge points 001, 002, and 003 are in Appendix 7-2.~~

Data in the DOGM Electronic Database for HC-1 in the Left Fork above the mine site show this seasonal pattern: from 1991 to 2001, only year 2000 had no reported flow. Data for RF-1 in the Right Fork show a similar pattern except that flows are smaller and there are more years with no reported flow.

Data in Appendices 7-1 and 7-6 show that HCSW-2 and HCSW-3, located below the Horse Canyon Mine site, were dry when monitored in May, August, and October 1994 and May and August 1995, even though HC-1 (HCSW-1), located upstream of the mine site, had flows all five months (Bates 005546-005549, 005912, 005928, 005943, 005961, 005972, 005985).

B-1 (HC-2) monitors Horse Creek in the valley, approximately one mile downgradient of where the channel emerges from the Book Cliffs. Maximum, minimum, and average flows reported at B-1 in the Water Quality and Flow Summaries table (prepared 2-2-90) in Appendix 7-2 (Bates 005641) are

apparently the result of mine discharge during 1981 through 1983: flow and other parameters for B-1 during 1981 and 1982 are recorded in the DOGM Electronic Database, but there is a gap in the DOGM data from late 1982 through 1988. No flow was reported during monthly monitoring between 1989 and 1996, and quarterly monitoring since 1997 through 2001 has also reported no flow.

Data from 1981 through 1983 for the Horse Canyon Mine's Utah Pollutant Discharge Elimination System (UPDES) discharge points 001, 002, and 003 are in Appendix 7-2 (Bates 005563-005645). Discharge.

Discharge from the mine to Horse Canyon Creek at ~~sites~~ UPDES discharge points 001 and 002 appears to have been constant from May 1981 to June 1983, although flows were typically small. Flow volume ~~from the sediment pond, UPDES at discharge point 003 below the mine~~ was not reported, although water samples were collected throughout the 3-year period. ~~Any~~ Surface-water data from this period, or earlier, ~~was probably would mainly be~~ mine-discharge water rather than surface runoff. There was no reported flow from site 003 from 1983 until reporting ceased in 1991.

Plate 7-4 shows surface-water monitoring sites for the Lila Canyon Mine. Because the drainages are ephemeral in nature and usually dry, there ~~are were~~ no historic baseline data, ~~not even reports stating no-flow~~; for L-1-S, L-2-S, and L-3-S in Lila Canyon, nor for surface water anywhere in the Lila Canyon drainage. ~~Because Lila Canyon is a smaller drainage than Horse Canyon, flows are expected to be smaller and less frequent than those from Horse Canyon.~~ A baseline water-monitoring program was implemented in July 2000, and data are to be collected at L-1-S through L-4-S (L-4-S is the proposed discharge point of the yet-to-be-built sedimentation pond ~~Section 731.200~~) to establish a current baseline and assure the sites are ~~usable (p. 30, Chapter 7; B# 005553 to 005557)-viable~~. L-1-S, L-2-S, and L-3-S were monitored in July and November 2000 and February, June and July 2001 with "no flow" reported for all five quarters at all four sites. Reports are in Appendix 7-1 (B# 005553 to 005557) of the PAP. In addition, quarterly data have continued to be collected since the final permit application was submitted in July 2001.

Water rights are listed in Table 7-2 (B# 005355 to 005357). Locations of water rights are shown on Plate 7-3 (B# 005661).

Horse Canyon flows to the Price River by way of Icelander and Grassy Trail Creeks, while Lila Canyon Creek flows southwest then south to the Price River by way of Grassy and Marsh Flat Washes. Little Park Wash, which is a major drainage of the proposed permit area, flows south, where any ephemeral flow its waters passes through a short stretch of Trail Canyon before reaching the Price River.

Baseline Cumulative Impact Area Information

Hydrologic and geologic studies have been conducted in the past by federal agencies and consultants working for Kaiser Steel Corporation and IPA. The United States Geological Survey (USGS) conducted studies in the early 1980's for the BLM to obtain data and information for the Environmental Impact Statement (EIS) in accordance with NEPA. Further studies were conducted by JBR Consultants when Kaiser Steel Corporation attempted to obtain a mine permit for the South Lease Area. EarthFax Engineering conducted hydrologic studies for IPA to assess the probable hydrologic impacts of the proposed operation. Additional information has been gathered by Environmental Industrial Services and submitted by the Permittee as part of the proposed mine permit amendment. Hydrologic and geologic

ENVIRONMENTAL RESOURCE INFORMATION

studies and publications provide resources information referenced many times in Chapters 6 and 7. A CHIA has been prepared by DOGM. Much of the hydrologic and geologic information that is necessary to assess the probable cumulative hydrologic impacts of the proposed operation and all anticipated mining on surface- and ground-water systems for the cumulative impact area is available from federal and state agencies (B# 006469 to 006470). Additional information has been gathered and submitted by the Permittee as part of the permit application. Outside sources for hydrologic and geologic information are referenced many times in Chapters 6 and 7. Baseline data are sufficient for proposed ground-water operational monitoring points. ~~presented in the permit application as well as information supplied from professional hydrologic and geologic publications.~~

Modeling

Actual surface- and ground-water information is supplied in this plan; therefore, modeling is not proposed. No surface-water modeling has been conducted.

Alternative Water Source Information

A search was conducted of the State of Utah Water Rights files for all rights occurring within, and adjacent to the permit area, for a distance of one mile. The location of these water rights are shown on Plate 7-3 (B# 005661) and a description of each of these rights is tabulated in Table 7-2 (B# 005664).

DOGM received a letter (B# 002037) from Mr. Josiah Eardley, a landowner, on March 30, 1999, which was during the 30-day Completeness comment period. Mr. Eardley asked the regulatory authority to ensure protection of water rights he owns in Sec. 11, T 16 S., T 14 E., near the proposed mine permit extension area. Mr. Eardley's water rights, as well as all water rights on the proposed permit area, were evaluated during the review process to ensure the utmost protection.

Mining has been conducted directly beneath or adjacent to springs H-18, H-18A, H-18B, H-19, H-21, H-21A, H-21B, H-22, and H-92 in the upper portion of Lila Canyon Wash. No more mining will be conducted to effect these springs (Plate 5-1, B# 005138, and Plate 7-1, B# 005659). The area already undermined includes water rights 91-617 and 91-618, totaling 0.22 cfs, in Sec. 11. These water rights are shown in Table 7-2 (B# 005355) as belonging to Mont Blackburn, but presumably these are the rights Mr. Eardley claims. Plate 5-3 (B# 005141) shows that the Lila Canyon Extension will not mine near any listed water rights in Sec. 11. All of the spring sources mentioned above flow down Lila Canyon Wash, no springs flow down Little Park Wash.

As noted in the table in Section 727, the majority of water rights are owned by UEI, for industrial use. There are other water rights owned by the BLM or other entities that are primarily used for livestock watering.

UEI owns the rights to approximately 1.50 cfs in this area. The PHC (Appendix 7-3) indicates little, if any, adverse effects on water resources resulting from the operation. Lost water sources would be replaced from the water rights owned by the company if such effects should become evident.

Probable Hydrologic Consequences (PHC) Determination

The PHC determination is provided as a separate document in Appendix 7-3 (B# 005646 to 005658). This determination indicates negative impacts of the mining or reclamation operation on the quality and quantity of surface and ground water under seasonal flow conditions for the proposed permit and adjacent areas.

The Permittee identifies potential adverse impacts in Chapter 7 which consist of :

1. Increased sediment loading;
2. Diminution or interruption of water supplies on water rights;
3. Discharge of contaminated ground water;
4. Erosion and streamflow alteration;
5. Deterioration of water quality.

Each of the above potential impacts has been evaluated in the PHC.

With underground mining, there always exists a potential for impacting surface or ground-water resources; however, as indicated in Section 525, subsidence effects are expected to be minimal due to the amount of cover and massive rock strata between the mine and the surface. Effects on underground water are also expected to be minimal, since this water is not presently issuing to the surface, and any necessary discharges of the water would be in accordance with UPDES requirements.

The Permittee indicated that no mine water is expected to be discharged. If it becomes necessary to discharge mine water, the receiving channel will be characterized to ensure that any changes in channel morphology as a result of a discharge will be mitigated. Any potential impacts to receiving streams in the event mine water is discharged from the mine are addressed.

Appendix 7-3 (B# 005646 to 005658) contains the determination of the PHC of the proposed operation based upon the quality and quantity of surface and ground water under seasonal flow conditions for the proposed permit and adjacent areas. The PHC determination is based on baseline hydrologic, geologic, and other information collected for the **PAP proposed amendment**. The Permittee finds in the PHC determination that, based on available data and expected mining conditions, the proposed mining and reclamation activity is not expected to proximately result in contamination, diminution or interruption of an underground or surface source of water within the proposed permit or adjacent area used for domestic, agricultural, industrial or other legitimate purpose.

The Permittee **has** determined that within the Lila Canyon permit area, the general seasonal streamflow is ephemeral although by definition in the Utah Coal Rules the streams are considered intermittent. The streams generally dry up by late spring, with only occasional runoff during the summer as the result of rainfall events (Appendix 7-3, p.6; B# 005654). **There are no water rights filed in either Horse or Lila Canyon.**

The Permittee suggests that due to the close proximity and similarities of mining and drainage conditions, water quality and impacts to the channels from pumping, the Lila Canyon Mine would be very similar to those experienced in the adjacent Horse Canyon Mine. There are no pre-mining data for Horse

ENVIRONMENTAL RESOURCE INFORMATION

Canyon, so the determination of impacts in Horse Canyon is based on water monitoring results and the absence of reports of negative impacts (Section 6.5.5.1, B# 005195). Channel morphology and characteristics will be determined before water is discharged from the mine to Lila Canyon, and impacts to Lila Canyon from mine water discharge can then be documented and, if necessary, reduced or eliminated (Volume 6, pp 25-26; B# 005359 to 005360 Section 728.333). Water discharged to Lila Canyon will be sampled and analyzed. If the natural quality of the discharge water does not meet UPDES standards, the water will be treated prior to discharge (pp. 28, 30; B# 005361, 005363).

Because of the disturbed areas and the potential for large runoff events, the control of erosion is a prime factor in maintaining the hydrologic balance within the mine permit area. Sediment controls and a sedimentation pond will be constructed at the new mine site to minimize impacts. Surface water will be protected by use of sediment controls and all sediment from the disturbed area will be routed to and deposited in the sedimentation pond.

Although subsidence has the potential to alter the ground-water flow regime in the area, several factors tend to limit the effects of subsidence on the ground-water regime. Most of the local springs flow from perched systems in the North Horn and overlying formations and are separated from the underlying saturated rock in the Blackhawk Formation regional aquifer. The North Horn Formation contains swelling clays that tend to heal small fractures. Finally, the perched aquifers are lenticular and discontinuous so there is a greater probability that fracturing, should it occur, in one area will not drain the overlying aquifers.

Springs are used by wildlife and livestock and are mostly located upstream of the permit areas or are in areas where subsidence resulting from post-1977 mining has not been documented and is not expected. Current conditions of springs and seeps, as evidenced in baseline data, reflect any impacts of 50 years of prior mining at the Horse Canyon Mine, as well as pre-mining conditions for the Lila Canyon area.

The Permittee has determined that it is unlikely there will be any measurable impacts from the mining and reclamation activities from the Lila Canyon Mine. Pre-mining data are not available for the Horse Canyon Mine (Section 724.100, B# 005340), but depletion of ground-water flow and quality during operation of the Horse Canyon Mine is has not been indicated by monitoring results, such as those in Appendices 7-2 and 7-6, and the Permittee has found no reports of depletion due to subsidence in the Horse Canyon permit area. The great thickness of strata between the coal seam and springs around and above the Lila Canyon Mine should provide protection to the springs, so they should continue to flow, with fluctuations that are related to variations in recharge from precipitation rather than mining and subsidence.

The Permittee stated that after reclamation, it is unlikely that the ground-water level in the regional aquifer Blackhawk Formation will ever rise to the level of any portal of either the Horse Canyon or Lila Canyon Mines, so there should be no natural discharge of ground water through any sealed portals. Standpipes are to be incorporated into the sealed portals of the Lila Canyon Mine so that water levels can be checked annually.

In the PHC (B# 005378) the Permittee states that, based on available information, and expected

mining conditions, the activities related to mining are not expected to cause contamination, diminution or interruption of any underground or surface water source within the proposed permit or adjacent areas.

Acid-forming or toxic-forming materials and streamflow alteration are two subjects that will require further investigation as mine construction and operation proceed (B# 005062, 005077, 005361, 005362, 005377, 005378, 005359, 005360). During the operational phase the Permittee will sample and collect data on rock and coal refuse mined to determine if those materials will yield unexpected constituents that will require special treatment or mitigation. The Permittee also plans to assess the potential for mine water or sediment pond discharges to determine if mitigation procedures will be required.

The Division determines that the PHC has been assessed and described adequately by the Permittee. The PHC states that interception of spring flows on the escarpment should not take place. Studies and site evaluation will be conducted during the operational period to assess the potential for acid/toxic forming materials and potential for UPDES discharges.

Findings:

The Permittee has addressed the minimum Hydrologic Resource Information requirements of the regulations.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 783.24, 783.25; R645-301-323, -301-411, -301-521, -301-622, -301-722, -301-731.

Minimum Regulatory Requirements:

The permit application must include as part of the Resource Information, the following maps, plans and cross sections:

Affected area boundary maps

The boundaries of all areas proposed to be affected over the estimated total life of the underground mining activities, with a description of size, sequence, and timing of the mining of subareas for which it is anticipated that additional permits will be sought.

Archeological site maps

Known archeological sites within the permit or adjacent areas. Note - Information on the nature and location of archeological resources on public land and Indian land as required under the Archeological Resources Protection Act of 1979 must be submitted separately from the application, and marked and held as confidential.

Coal resource and geologic information maps

Nature, depth, and thickness of the coal seams to be mined, any coal or rider seams above the seam to be mined, each stratum of the overburden, and the stratum immediately below the lowest coal seam to be mined. All coal crop lines and the strike and dip of the coal to be mined within the proposed permit area.

Cultural resource maps

The boundaries of any public park and locations of any cultural and historical resources listed or eligible for listing in the National Register of Historic Places. Each cemetery that is located in or within 100 feet of the proposed permit area. Any land within the proposed permit area which is within the boundaries of any units of the National System of Trails or the Wild and Scenic Rivers System, including study rivers designated under Section 5(a) of the Wild and Scenic Rivers Act. Any other relevant information required by the Division.

Existing structures and facilities maps

ENVIRONMENTAL RESOURCE INFORMATION

Location and dimensions of existing areas of spoil, waste, coal development waste, and noncoal waste disposal, dams, embankments, other impoundments, and water treatment and air pollution control facilities within the proposed permit area.

Existing surface configuration maps

Sufficient slope measurements to adequately represent the existing land surface configuration of the area affected by surface operations and facilities, measured and recorded according to the following: each measurement shall consist of an angle of inclination along the prevailing slope extending 100 linear feet above and below or beyond the coal outcrop or the area to be disturbed or, where this is impractical, at locations specified by the Division; where the area has been previously mined, the measurements shall extend at least 100 feet beyond the limits of mining disturbances, or any other distance determined by the Division to be representative of the premining configuration of the land; and, slope measurements shall take into account natural variations in slope, to provide accurate representation of the range of natural slopes and reflect geomorphic differences of the area to be disturbed.

Mine workings maps

Location and extent of known workings of active, inactive, or abandoned underground mines, including mine openings to the surface within the proposed permit and adjacent areas. Location and extent of existing or previously surface-mined areas within the proposed permit area.

Monitoring and sampling location maps

Elevations and locations of test borings and core samplings. Elevations and locations of monitoring stations used to gather data on water quality and quantity, fish and wildlife, and air quality, if required, in preparation of the application

Permit area boundary maps

The boundaries of land within the proposed permit area upon which the applicant has the legal right to enter and begin underground mining activities.

Subsurface-water resource maps

Location and extent of subsurface water, if encountered, within the proposed permit or adjacent areas, including, but not limited to, areal and vertical distribution of aquifers, and portrayal of seasonal differences of head in different aquifers on cross sections and contour maps.

Surface and subsurface manmade features maps

The location of all buildings in and within 1,000 feet of the proposed permit area, with identification of the current use of the buildings. The location of surface and subsurface manmade features within, passing through, or passing over the proposed permit area, including, but not limited to, major electric transmission lines, pipelines, and agricultural drainage tile fields. Each public road located in or within 100 feet of the proposed permit area.

Surface and subsurface ownership maps

All boundaries of lands and names of present owners of record of those lands, both surface and subsurface, included in or contiguous to the permit area.

Surface-water resource maps

The locations of water-supply intakes for current users of surface waters flowing into, out of, and within a hydrologic area defined by the Division, and those surface waters which will receive discharges from affected areas in the proposed permit area. Location of surface-water bodies such as streams, lakes, ponds, springs, constructed or natural drains, and irrigation ditches within the proposed permit and adjacent areas.

Vegetation reference area maps

The location and boundaries of any proposed reference areas for determining the success of revegetation.

Well maps

Location, and depth if available, of gas and oil wells within the proposed permit area and water wells in the permit area and adjacent areas.

Cross sections, maps, and plans included in a permit application as required by this section shall be prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, a professional geologist, or in any State which authorizes land surveyors to prepare and certify such cross sections, maps, and plans, a qualified, registered, professional, land surveyor, with assistance from experts in related fields such as landscape architecture, and shall be updated periodically as required by the Division.

Analysis:**Affected Area Boundary Maps**

Plate 5-4 and other maps show the permit boundaries that are the same as the affected area boundaries for the Horse Canyon Mine which includes the Horse Canyon project and the Lila Canyon project. Plate 5-5, Mine Map, shows the affected area boundaries for the Lila Canyon project and the timing and sequence of mining. These maps and plans were prepared and certified by a registered professional engineer in accordance with R645-301-512.

Contour maps of the proposed disturbed area and mining areas are included as Plates 5-2A, 5-2B, 7-1 and 7-2. These are USGS based contour maps and accurately represent the proposed permit and adjacent areas.

Archeological Site and Cultural Resource Maps

The locations of cultural and historic resources in the area are shown on Plate 4-3 and on maps in Appendix 4-1.

Coal Resource and Geologic Information Maps

For Lila Canyon, depth to the Sunnyside Seam, which is the seam to be mined, is shown on the Cover and Structure Map on Plate 6-4. Thickness of the Sunnyside Seam is shown on the Coal Thickness Isopach map on Plate 6-3. Thickness and nature of the Sunnyside Seam, of coal or rider seams above the Sunnyside Seam, and of the stratum immediately below the Sunnyside Seam are shown on the Coal Sections on Plate 6-5. The cross section on Figure 7-1 shows the rock tunnels, the dip of the strata, stratigraphy, and expected ground-water elevation.

Figures VI-1 and VI-2 portray the general stratigraphy of the permit and adjacent areas. Plate 6-1 shows surface geology, including coal crop lines, and the strike and dip of the Sunnyside Seam within the proposed permit area. Major faults are shown on Plates 6-1 through 6-5, and structural elevation contours on the Sunnyside Seam are on Plate 6-4. The Sunnyside fault, shown on Plates 6-1 and 6-2 of the Lila Canyon permit and Plate II-2 of the current MRP, limited mining to the east in the Horse Canyon Mine but is not expected to extend into the Lila Canyon Mine area, so is not expected to limit coal recovery at the Lila Canyon Mine.

Coal seam elevations determined from the outcrop and bore holes are on Plates 6-2, 6-3, and 6-4. The plates indicate that the coal seam crops out at approximately 6,500 feet in the vicinity of the rock-slope tunnels. The tunnels will intercept the coal seam at approximately 6,300 feet (Appendix 8-2 - Figure 7-1).

Depth of cover ranges from approximately 1,500 to 2,300 feet (Section 525.120), but minimum overburden thickness will be less than 500 feet in mine workings nearest the escarpment. The escarpments will be protected from subsidence by conducting first-mining only near the escarpments where overburden

ENVIRONMENTAL RESOURCE INFORMATION

is 500 feet or less (Plate 5-5). Overburden is, for the most part, around 1,500 feet. Because of the flat topography of Little Park Wash, the deeper coal is generally to the east and north (Section 6.3.)

Existing Structures and Facilities Maps

Plate 5-1A, Pre-Mining Contours, shows the existing structures in the proposed Lila Canyon disturbed area. The existing structures are a 36-inch culvert (scheduled to be replaced when the mine facilities area constructed) and the Emery County access road above the culvert. A description of the culvert is given in Sections 526.110 and 521.120 of the MRP and the road in Section 526.116.

Existing Surface Configuration Maps

The MRP shows the existing surface contours on Plate 5-1A. The contours on Plate 5-1A extend more than 100 feet beyond the disturbed area boundaries. The contour intervals on Plate 5-1A are 25 feet.

Mine Workings Maps

Plate 5-1 shows the mine workings in and adjacent to the permit area, including the Horse Canyon, the Old Book Cliffs mine and the Lila Canyon project. The DOGM Abandoned Mine Reclamation program inspected the area in and around the Lila Canyon site and found no evidence of underground workings not shown on Plate 5-1.

Monitoring Sampling Location Maps

The Permit Application Package identifies that the location of all known seeps and springs, as well as watering ponds or tanks are shown on Plate 7-1 (B# 005659). There are no perennial streams, lakes, ponds, or irrigation ditches known to exist within the proposed Lila Canyon Extension.

Elevations and locations of test borings are on Plates 6-2, 6-3, and 6-4, except that the location of S-32 is not known and therefore not shown on any map. It can be determined from the log in Appendix 6-1 that S-32 is in T. 17 S., R. 15 E. but the Section cannot be identified because of the poor quality of the copy. Elevations of core samples are tabulated in Tables VI-1 and VI-3. Monitoring wells IPA-1, IPA-2, and IPA 3 are shown on Plates 7-1 and 7-4.

Springs in the vicinity of the Lila Canyon permit (Table 7-1 and Appendices 7-1, 7-2, and 7-6) contains water-quality or -quantity data from three different surveys. JBR surveyed the springs in 1989 which consist of (S-1), 9 (S-9), 10 (S-10), 14 (S-14), 16(S-16, 16Z), H-1, H-2 (HC-2), H-3, H-4 (H-C4), H-5, H-6, H-7, H-8, H-9 (HC-9), H-10, H-11 (HC-11), H-13 (HC-13), H-14 (HC-14), H-18 (HC-18), H-19, H-20, H-21, H-22, and H-92. EarthFax Engineering also identified a number of springs and seeps in their surveys of 1993-1994, for which no water-quality analyses were done and which consist of; 1A,1B, 2, 3, 3A, 3B, 3C, 3D, 4, 5, 6, 7, 8, 8A, 8B, 9R, 10A, 11, 12, 12A, 12B, 12C, 12D, 12E, 13, 13A, 13B, 13Z, 14A, 15, 15A, 15B, 15C, 16A, 16B, 16C, 17, 17A, 17B, 18, 19A, 19B, 19C, 20, and 22 (Appendix 7-1). Elevations and locations of these monitoring stations are on Plate 7-1. Locations of springs 8B, 15A, 17B, and 19C could not be matched between the JBR and EarthFax surveys.

Horse Canyon Mine UPDES discharge points UT022926 - 001, - 002, and - 003 (monitored from 1979 to 1991) are on Plates 7-1 and 7-4. Currently monitored UPDES discharge points, UT040013- 001A and - 002A are also shown. Proposed UPDES points L-4-S and L-5-G are on Plate 7-4.

Data for surface-water monitoring points HCSW-1 (HSW-1, HC-1), HCSW-2, HCSW-3, B-1 (HC-2), and RF-1 are in Appendices 7-1, 7-2, and 7-6. Locations are shown on Plate 7-1. Locations for L-1-S, L-2-S, and L-3-S are on Plate 7-4. There are no baseline data for these points so they are not on Plate 7-1.

Permit Area Boundary Maps

Several maps including Plate 5-1 show the location of the permit boundaries for the Horse Canyon mine area. The Permittee has divided the permit boundary into Permit Area A (Horse Canyon Mine) and Permit Area B (Lila Canyon Mine). These areas have been identified on Plate 5-1, which also indicates that Permit Area B is an **extension significant revision** to the Horse Canyon Mine Permit.

Plate 4-4 identifies the areas on and adjacent to the Horse Canyon Mine and proposed **permit extension significant revision** area that are designated Wilderness Study Areas (WSA's) or Wilderness Inventory Units (WIU's) currently being evaluated by the BLM for wilderness potential. Two WIU's and on WSA lie within and adjacent to the proposed **permit extension significant revision** area. The Turtle Canyon WSA and WIU encompass the eastern half of the permit area. The Desolation WIU extends from the south to encompass the southwestern part of the proposed **extension significant** area. The Turtle Canyon WIU extends west of the Turtle Canyon WSA.

Surface and Subsurface Ownership Maps

Plates 4-1, 5-3, and 5-4 show surface and coal ownership in and contiguous to both the existing permit area and the proposed addition.

Subsurface Water Resource Maps

Ground water was encountered in several bore holes as well as in the Horse Canyon Mine. Water-level elevation contours are on Plate 7-1; otherwise, areal and vertical distribution of aquifers within the proposed permit or adjacent areas are not shown on a map. Seasonal variation in the water levels is tabulated in Appendix 7-1 and 7-2 for the IPA **piezometers wells**. seasonal differences of head on cross sections and contour maps.

The MDC well in NW Section 9 of T 16 S, R 14 E, near the road junction, is listed in Table 7-2 - Water Rights; however, to the best of the Permittee's knowledge this well has been sealed. The Horse Canyon Well that is located nearer the Horse Canyon Mine surface facilities will be used during mine operation and reclamation, then cased and sealed after final reclamation activities are complete. (Section 722.400). These wells, which were installed for observation of ground water in the alluvium in Horse Canyon, are discussed in Sections 6.5.1 and 724.200. Both wells are shown on Plate 7-1.

ENVIRONMENTAL RESOURCE INFORMATION

S-26 and S-31, located south of the Williams Draw Fault, were offset with shallow piezometers A-26 and A-31 to observe ground water in the alluvium (Table 6-3). Table VI-3 does not indicate that these wells have been plugged and abandoned; however, the Permittee has no data on A-26 and A-31 (Section 6.5.1, p. 21) and considers these wells unusable for ground-water monitoring (Section 724.100). These wells are not shown on Plate 7-1.

The ground-water elevation in the Horse Canyon Mine, at the rotary car dump at the intersection of the Main slope and 3rd level, is described in Section 724.100 (page 14); it was approximately 5,800 feet in 1986 and the Permittee states that it probably has remained at this level since operations ceased in the Horse Canyon Mine. This projected ground-water elevation appears to have been used in projecting the piezometric surface mapped on Plate 7-1. The location of the dump is described in the text and is shown on Plate 7-1.

Water rights are listed in Table 7-2. The list includes Redden Spring, plus springs identified as Mont, Leslie, Cottonwood, Williams, Kenna, and Pine. In addition, there are eleven unnamed springs listed, plus a well. Locations are on Plate 7-3.

Surface Water Resource Maps

Locations of streams and seeps and springs are shown on Plate 7-1. There are no known perennial streams, lakes or ponds within the permit and adjacent areas.

Table 7-2 lists water rights and Plate 7-3 shows locations of these water rights.

Text in Section 724.200 refers to Plate 7-1 for the location of Horse Canyon Creek and Lila Canyon drainage and Little Park Wash. Range Creek drainage is mentioned in the description of the ground-water divide of the main aquifer in Section 724.100, but Range Creek lies 6 miles east of the Lila Canyon area and is not shown on any of the maps.

Vegetation Reference Area Maps

Figure 1 in Appendix 3-2 is a map showing the vegetation communities and the reference area in relation to the proposed disturbance, and Plate 3-2 shows vegetation communities of the proposed addition to the permit area.

Well Maps

Three water monitoring wells were drilled in the area, IPA #1, IPA #2 and IPA #3, to monitor mine water levels. The wells were cased and perforated at the coal seam to measure the head of water to rise. The well locations are shown on Plate 7-1.

Two wells were installed for observation of ground water in the alluvium in Horse Canyon. The MDC well, which has been sealed, and the Horse Canyon Well located nearer the Horse Canyon Mine surface facilities are shown on Plate 7-1.

One oil exploration hole was drilled south of the proposed Lila Canyon permit area, in Section 25, T. 16 S., R 14 E., SLM, by Forest Oil Company. The location of the hole is shown on Plate 6-2. According to the Division's records, the well was completed in October 1959. No oil, gas, or water was reported. The well was drilled to a depth of 12,602 feet. It spudded in the Price River Formation and was in that formation to a depth of 370 feet, then passed through the Blackhawk Formation from 370 feet to 906 feet, a thickness of 536 feet.

Contour Maps

R645-301.722.100 requires the location and extent of subsurface water if encountered within the proposed permit or adjacent areas. For underground mining, the extent and location will include the areal and vertical distribution of aquifers, and portrayal of seasonal differences of head in different aquifers on cross-sections and contour maps. The springs that issue from the Wasatch Group will not be encountered by mine operations because of the extensive overlying strata between the coal seam to be mined and the aquifer (700 to 2500 feet). Therefore cross-sections and maps are not required for the shallow aquifers which feed these springs. The Division does have maps depicting the general location of the aquifers and spring flow data which shows seasonal differences. This seasonal data is in tabular format which is the most useful format.

Plate 6-4, (B# 5329) shows groundwater exists in the deep saturated zone of the Mesa Verde group. It exists in multi perched zones throughout the formations. The deep saturated zones above and below the coal seam will be encountered by mining, but these zones do not meet the definition of "aquifer" under the rules (because the water has no use). Therefore maps, and cross-sections are not required for these deep zones. The Division does have maps depicting the general areal location and depth of the deep saturated zones and water level data in tabular form. The Permittee has submitted Plate 7-1, (B# 005659) identifying the apparent gradient and extent of the expected water level in the coal seam. The information was plotted from data collected in the piezometers, IPA-1, IPA-2 and IPA-3. This data has shown no seasonal pattern.

The gradient and extent could change some, but the information provides the Division with the information necessary to identify potential mine discharge, which is the intent of the regulation (R645-301.722.100). Water samples are not necessary since any water contacted and discharged from the mine will be stored, sampled, treated, if necessary, and discharged only after meeting state and federal water quality standards.

Contour Maps of the proposed disturbed area and mining areas are included as Plates 5-2A, 5-2B, 7-1 and 7-2. These maps are USGS based contours and accurately represent the proposed permit and adjacent areas. Disturbed area maps are based on aerial photography for greater detail, and are tied to relevant USGS elevations.

The Permittee gave the Division premining, operational and reclamation contour maps of the Lila Canyon site. The scale of the maps and the contour intervals are adequate, because the maps have a scale of 1 inch equals 100 feet and have 5 foot contour intervals.

ENVIRONMENTAL RESOURCE INFORMATION

All maps and plans were prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, with assistance from experts in related fields (Section 712).

Findings:

The Permittee has met the minimum regulatory requirements for maps, plans and cross-sections.

Page 72

C/007/013-SR98(+)-6 RBO

~~July 19, 2001~~ January 9, 2002

ENVIRONMENTAL RESOURCE INFORMATION



OPERATION PLAN

OPERATION PLAN

MINING OPERATIONS AND FACILITIES

Regulatory Reference: 30 CFR Sec. 784.2, 784.11; R645-301-231, -301-526, -301-528.

Minimum Regulatory Requirements:

The objectives of this section is to ensure that the Division is provided with comprehensive and reliable information on proposed underground mining activities, and to ensure that those activities are allowed to be conducted only in compliance with the regulatory program.

Provide a general description of the mining operations proposed to be conducted during the life of the mine within the proposed permit area, including, at a minimum, the following: a narrative description of the type and method of coal mining procedures and proposed engineering techniques, anticipated annual and total production of coal, by tonnage, and the major equipment to be used for all aspects of those operations; and, a narrative explaining the construction, modification, use, maintenance, and removal of the following facilities (unless retention of such facility is necessary for postmining land use is specified.) The following facilities must be described: dams, embankments, and other impoundments; overburden and topsoil handling and storage areas and structures; coal removal, handling, storage, cleaning, and transportation areas and structures; spoil, coal processing waste, mine development waste, and noncoal waste removal, handling, storage, transportation, and disposal areas and structures; mine facilities; and, water pollution control facilities.

Analysis:

The Permittee proposes to develop surface facilities and mine portals near Lila Canyon. The Permittee wants to develop the Lila Canyon facilities because access to the coal reserves through the Horse Canyon portals is not feasible.

Access to the coal will be through two 1,200-foot tunnels that will be driven from a cliff base. The ventilation portal will be driven from underground workings to the surface. See Plate 5-2 for the locations. Initial mining will be conducted by room-and-pillar methods in the Lower Sunnyside coal seam. Production in the first year is estimated to be 200,000 tons, the second to fifth year 1,000,000 to 1,500,000 tons per year. If demand increases, the Permittee will install longwall equipment and production could peak at 4,500,000 tons per year.

Type and Method of Mining Operations

Coal mining will begin in Section 15, T16S, R14E, in the Lower Sunnyside coal seam. Development of the Lower Sunnyside coal seam will be in a down dip direction toward the east. The seam will be accessed by two 1,200 foot slopes driven up at a 12 percent grade from the cliffs. The ventilation fan portal will be driven from underground workings to the surface.

Initial mining will be conducted by room-and-pillar method in the Lower Sunnyside coal seam. Production in the first year is estimated to be 200,000 tons, the second to fifth year 1,000,000 to 1,500,000 tons per year. In Appendix 4-3, Air Quality, the Permittee stated in a letter dated August 27, 1999 to the Division of Air Quality that a maximum of 1,500,000 tons will be produced every year.

OPERATION PLAN

If demand increases, the Permittee will install longwall equipment and production could peak at 4,500,000 tons per year. The estimated life-of-mine is 20 years.

Mine development will start with tunnel construction. Once the coal is encountered development will continue using continuous miners and various types of haulage equipment.

Ventilation of the mine will be by an exhaust type system. The Permittee estimates that 900,000 cfm will be required at full production. Intake air will be supplied by slopes and entries from the surface.

Dust suppression will be accomplished by the use of sprays on all underground equipment as required. Sprays will also be used along sections of the conveyors and some transfer points.

No major de-watering concerns are anticipated at this property. The workings are expected to produce some water with more water being produced as the depth of mining increases. Some of this water will be used for dust suppression. The remainder will be collected in sumps and pumped to mined out sections of the mine or to the surface and treated when necessary.

In Section 523, the Permittee listed the major mining equipment that will be used. The equipment is consistent with a major underground coal mining operation.

Facilities and Structures

The new support facilities are described in Section 520 and shown on Plate 5-2 and in the appendixes in Chapter 5. Appendix 5-4, New Facility Design, shows the design for the roads and sewage system. Appendix 5-7 has the designs for the refuse pile. The new structures and facilities listed in Section 520 include:

- Mine Facilities Road
- Security Shack
- Mine Substation
- Office/Bathhouse/Warehouse Parking Area
- Office/Bathhouse
- Mine Parking
- Shop Warehouse
- Non-Coal Waste Area
- Equipment & Supplies Storage Area
- Sewer Tank & Drain Field
- Water Treatment Plant
- Potable Water Tank
- Process Water Tank
- Topsoil Pile
- Refuse Pile
- Sediment Pond
- Slope Access Road
- Rock Slopes

OPERATION PLAN

Ventilation Fan
Run of Mine (ROM) Underground Belt
ROM Storage Pile
Crusher
Coal Storage Bin
Truck Scale and Loadout

The Permittee proposes to construct one impoundment, a sediment pond shown on Plate 5-2. Since Lila Canyon is an underground mine, no overburden or spoil will be removed. The Permittee does not plan on cleaning or processing the coal beyond crushing. Any coal mine waste produced from crushing will be placed in the refuse pile shown on Plate 5-2.

In Section 528.100 the Permittee describes how the coal will be handled and stored. The Permittee outlined the coal storage area on Plate 5-2. The Air Quality Approval Order allows for stockpiling coal.

In Section 528.300 the Permittee described the handling and storage of spoil, coal processing waste, mine development waste, and noncoal waste. Since Lila Canyon is an underground mine, the Permittee does not expect any excess spoil. Coal mine waste will be disposed of in the areas shown on Plate 5-2.

The water pollution facilities include the drain fields and sediment pond.

Findings:

The Permittee has described the general mining operations proposed to be conducted during the life of the mine within the proposed permit area; therefore, the Permittee has met the minimum requirements of the regulations.

EXISTING STRUCTURES

Regulatory Reference: 30 CFR Sec. 784.12; R645-301-526.

Minimum Regulatory Requirements:

"Existing Structure" means a structure or facility used in connection with or to facilitate coal mining and reclamation operations for which construction began prior to January 21, 1981.

Provide a description of each existing structure proposed to be used in connection with or to facilitate the surface coal mining and reclamation operation. The description shall include: the location; plans of the structure which describe its current condition; approximate dates on which construction of the existing structure was begun and completed; and, a showing, including relevant monitoring data or other evidence, whether the structure meets the permanent program performance standards or, if the structure does not meet the permanent program performance standards, a showing whether the structure meets the interim program performance standards.

Provide a compliance plan for each existing structure proposed to be modified or reconstructed for use in connection with or to facilitate the surface coal mining and reclamation operation. The compliance plan shall include: design specifications for the modification or reconstruction of the structure to meet the permanent program design and performance standards; a construction schedule which shows dates for beginning and completing interim steps and final reconstruction; provisions for monitoring the structure during and after modification or reconstruction to ensure that the permanent program performance standards are met; and, a showing that the risk of harm to the environment or to public health or safety is not significant during the period of modification or reconstruction.

Analysis:

Two existing structures appear in the pre-mined proposed permit area, a County road and a 36 -inch culvert is shown on Plate 5-1A. It has been determined that the culvert is not large enough to use during the mining process. The culvert will be removed and replaced with a 60 -inch culvert. The county road will be excavated during upgrading of the culvert. The county road is considered adequate for continued use and will not be upgraded.

Findings:

The Permittee met the minimum Existing Structures requirements of the regulations.

PROTECTION OF PUBLIC PARKS AND HISTORIC PLACES

Regulatory Reference: 30 CFR Sec. 784.17; R645-301-411.

Minimum Regulatory Requirements:

For any publicly owned parks or any places listed on the National Register of Historic Places that may be adversely affected by the proposed operation, each plan shall describe the measures to be used to prevent adverse impacts, or if valid existing rights exist or joint agency approval is to be obtained, to minimize impacts.

The Division may require the applicant to protect historic and archeological properties listed on or eligible for listing on the National Register of Historic Places through appropriate mitigation and treatment measures. Appropriate mitigation and treatment measures may be required to be taken after permit issuance provided that the required measures are completed before the properties are affected by any mining operation

Analysis:

The proposed addition to the permit area contains no known cultural resources listed or eligible for listing in the National Register of Historic Places, public parks, or units of the National System of Trails or the Wild and Scenic Rivers system. Therefore, no protection plan is needed.

On September 22, 1999, March 8, 2001, and March 27, 2001, the Division wrote letters to the State Historic Preservation Office (SHPO) requesting their concurrence with the project. Because the Division did not receive a response, a Division representative visited the office of the Division of State History on April 18, 2001. Jim Dykman of SHPO told this representative that since SHPO did not respond within 30 days of the Division's letters, SHPO had concurred with the Division's conclusion that there would be "no effect" on historic properties. This determination is documented by Paul Baker in a memorandum to file dated April 18, 2001.

The Turtle Canyon WSA overlaps with the proposed addition to the permit area in the following locations:

- Township 16 South, Range 14 East
- Section 13, E $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$
- Section 24, NE $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$

OPERATION PLAN

Township 16 South, Range 15 East
Section 19, SE $\frac{1}{4}$ SW $\frac{1}{4}$, Lots 3 and 4
Section 30, SW $\frac{1}{4}$ NE $\frac{1}{4}$

The Permittee has not proposed surface disturbance activities in these areas. If the Permittee proposes any activities in these areas, they will be subject to additional permitting requirements.

The BLM has prepared two EA's discussing the anticipated effects of readjusting two coal leases and how mining would affect the Turtle Canyon WSA. According to the December 1994 EA, the greatest effects of subsidence from other mines in the area have been general ground lowering and some surface tension cracks that tend to self heal after a year or two. In areas with mining depths greater than 1500 feet, little measurable subsidence has occurred. The BLM concluded that the lease readjustments and underground mining in the WSA are in conformance with the approved land use plan.

The Land Use Resource Information section of this analysis discusses the 1999 Utah Wilderness Inventory. According to information from the BLM and contained in the application, the land will not be managed as a WSA until further analyses have been completed.

Findings:

The Permittee has met the minimum Protection of Public Parks and Historic Places requirements of the regulations.

RELOCATION OR USE OF PUBLIC ROADS

Regulatory Reference: 30 CFR Sec. 784.18; R645-301-521, -301-526.

Minimum Regulatory Requirements:

Describe, with appropriate maps and cross sections, the measures to be used to ensure that the interests of the public and landowners affected are protected if, the applicant seeks to have the Division approve conducting the proposed underground mining activities within 100 feet of the right-of-way line of any public road, except where mine access or haul roads join that right-of-way, or relocating a public road.

Analysis:

Appendix 1-4 of the application contains a copy of a letter from the Emery County Road Department dated January 10, 2001. The letter states the following:

“Said approval authorizes mining activities to be conducted within 100 feet of the public road with the provision that, to provide for public safety, a 6 foot chain link fence shall be constructed adjacent to the road right-of-way in the vicinity of the surface facilities area.

“Additionally, the location of the fence must not restrict continued public use of the road.”

Plate 5-2 shows that the chain link fence will border the road.

Findings:

The Permittee has addressed the minimum Relocations or Use of Public Roads requirements of the regulations.

AIR POLLUTION CONTROL PLAN

Regulatory Reference: 30 CFR Sec. 784.26, 817.95; R645-301-244.

Minimum Regulatory Requirements:

Coal mining and reclamation operations will be conducted in compliance with the requirements of the Clean Air Act (42 U.S.C. Sec. 7401 et seq.) and any other applicable Utah or federal statutes and regulations containing air quality standards. The application will contain a description of coordination and compliance efforts which have been undertaken by the applicant with the Utah Bureau of Air Quality.

Analysis:

Appendix 4-3 contains a copy of the Air Quality Approval Order from the Division of Air Quality. A letter in Appendix 4-3 from Jay Marshall to the Division of Air Quality says the Permittee was requesting approval for a throughput of up to 2,000,000 tons per year, but the Approval Order says up to 1,500,000 tons of coal could be mined in a rolling twelve month period. Section 523 of the application indicates production should be between 1,000,000 and 1,500,000 tons per year for the first five years, but that production could peak at 4,500,000 tons. Therefore, the application is consistent with the Air Quality Approval Order (for the first five years). Any increase in production after five years would require amendments to both the Air Quality Approval Order and the MRP.

Findings:

The Permittee has addressed the minimum regulatory requirements for the Air Pollution Control plan.

COAL RECOVERY

Regulatory Reference: 30 CFR Sec. 817.59; R645-301-522.

Minimum Regulatory Requirements:

Underground mining activities shall be conducted so as to maximize the utilization and conservation of the coal, while utilizing the best technology currently available to maintain environmental integrity, so that re-affecting the land in the future through surface coal mining operations is minimized.

Analysis:

As part of the federal mine plan approval and to meet the requirements of the federal leases, the Permittee is required to submit a R2P2 to the BLM. The BLM staff analyzed the R2P2 for maximum economic recovery and found that the Permittee met that requirement.

OPERATION PLAN

The Division bases their findings on several factors including technical analysis from other agencies, such as the BLM, for maximum coal recovery. The Division staff reviewed the mine plan and found no significant coal reserves within the permit area that were not being recovered.

The BLM analyzed the available coal resources and prepared a R2P2 approval document for the Lila Canyon area. The BLM has staff that specialize in determining if the mine plan will maximize coal recovery. The Division determines that maximum coal recovery will be conducted.

Findings:

The Permittee has addressed the minimum Coal Recovery requirements of the regulations.

SUBSIDENCE CONTROL PLAN

Regulatory Reference: 30 CFR Sec. 784.20, 817.121, 817.122; R645-301-521, -301-525, -301-724.

Minimum Regulatory Requirements:**Renewable resources survey**

Include a survey, which shall show whether structures or renewable resource lands exist within the proposed permit area and adjacent area and whether subsidence, if it occurred, could cause material damage or diminution of reasonably foreseeable use of such structures or renewable resource lands. If the survey shows that no such structures or renewable resource lands exist, or no such material damage or diminution could be caused in the event of mine subsidence, and if the Division agrees with such conclusion, no further information need be provided in the application under this section.

Subsidence control plan

In the event the survey shows that such structures or renewable resource lands exist, and that subsidence could cause material damage or diminution of value or foreseeable use of the land, or if the Division determines that such damage or diminution could occur, the application shall include a subsidence control plan which shall contain the following information:

- 1.) A description of the method of coal removal, such as longwall mining, room-and-pillar removal, hydraulic mining, or other extraction methods, including the size, sequence, and timing for the development of underground workings.
- 2.) A map of underground workings which describes the location and extent of areas in which planned-subsidence mining methods will be used and which includes all areas where measures will be taken to prevent or minimize subsidence and subsidence related damage and where appropriate, to correct subsidence-related material damage.
- 3.) A description of the physical conditions, such as depth of cover, seam thickness, and lithology, which affect the likelihood or extent of subsidence and subsidence-related damage.
- 4.) A description of monitoring, if any, needed to determine the commencement and degree of subsidence so that, when appropriate, other measures can be taken to prevent, reduce, or correct material damage.
- 5.) Except for those areas where planned subsidence is projected to be used, a detailed description of the subsidence control measures that will be taken to prevent or minimize subsidence and subsidence-related damage, including, but not limited to: backstowing or backfilling of voids; leaving support pillars of coal; leaving areas in which no coal is removed, including a description of the overlying area to be protected by leaving the coal in place; and, taking measures on the surface to prevent material damage or lessening of the value or reasonably foreseeable use of the surface.
- 6.) A description of the anticipated effects of planned subsidence, if any.
- 7.) A description of the measures to be taken to mitigate or remedy any subsidence-related material damage to, or diminution in value or reasonably foreseeable use of the land, or structures or facilities to the extent required under State law.
- 8.) Other information specified by the Division as necessary to demonstrate that the operation will be conducted in accordance with the performance standards for subsidence control.

Performance standards for subsidence control

The operator shall either adopt measures consistent with known technology which prevent subsidence from causing material damage to the extent technologically and economically feasible, maximize mine stability, and maintain the value and reasonably foreseeable use of

OPERATION PLAN

surface lands; or, adopt mining technology which provides for planned subsidence in a predictable and controlled manner. Nothing in this part shall be construed to prohibit the standard method of room-and-pillar mining.

The operator shall comply with all provisions of the approved subsidence control plan.

The operator shall correct any material damage resulting from subsidence caused to surface lands, to the extent technologically and economically feasible, by restoring the land to a condition capable of maintaining the value and reasonably foreseeable uses which it was capable of supporting before subsidence, and, to the extent required under applicable provisions of State law, either correct material damage resulting from subsidence caused to any structures or facilities by repairing the damage or compensate the owner of such structures or facilities in the full amount of the diminution in value resulting from the subsidence. Repair of damage includes rehabilitation, restoration, or replacement of damaged structures or facilities. Compensation may be accomplished by the purchase prior to mining of a non-cancelable premium-prepaid insurance policy.

Underground mining activities shall not be conducted beneath or adjacent to: public buildings and facilities; churches, schools, and hospitals; or, impoundments with a storage capacity of 20 acre-feet or more or bodies of water with a volume of 20 acre-feet or more, unless the subsidence control plan demonstrates that subsidence will not cause material damage to, or reduce the reasonably foreseeable use of, such features or facilities. If the Division determines that it is necessary in order to minimize the potential for material damage to the features or facilities described above or to any aquifer or body of water that serves as a significant water source for any public water supply system, it may limit the percentage of coal extracted under or adjacent thereto.

If subsidence causes material damage to any of the features or facilities, the Division may suspend mining under or adjacent to such features or facilities until the subsidence control plan is modified to ensure prevention of further material damage to such features or facilities.

The Division shall suspend underground mining activities under urbanized areas, cities, towns, and communities, and adjacent to industrial or commercial buildings, major impoundments, or perennial streams, if imminent danger is found to inhabitants of the urbanized areas, cities, towns, or communities.

Within a schedule approved by the Division, the operator shall submit a detailed plan of the underground workings. The detailed plan shall include maps and descriptions, as appropriate, of significant features of the underground mine, including the size, configuration, and approximate location of pillars and entries, extraction ratios, measures taken to prevent or minimize subsidence and related damage, areas of full extraction, and other information required by the Division. Upon request of the operator, information submitted with the detailed plan may be held as confidential.

Notification

At least 6 months prior to mining, or within that period if approved by the Division, the underground mine operator shall mail a notification to all owners and occupants of surface property and structures above the underground workings. The notification shall include, at a minimum, identification of specific areas in which mining will take place, dates that specific areas will be undermined, and the location or locations where the operator's subsidence control plan may be examined.

Analysis:

Renewable Resources Survey

The Permittee acknowledges that renewable resources exist in the proposed subsidence area. Grazing is identified as a land use in the Lila Canyon tract, and there is at least some recharge to aquifers. Since renewable resources exist in the permit area, the Permittee conducted a subsidence survey.

According to the application, the main potential effects of subsidence would be escarpment failure and disruption of surface and ground water. Two eagle nests are in the subsidence area. Protection of these nests or mitigation for loss of the nests is discussed in detail in the section of this TA dealing with the fish and wildlife protection plan.

The mitigation for losses of wildlife habitat through subsidence could include habitat enhancement to increase production of selected forage species, and development of off-site water sources, such as guzzlers.

OPERATION PLAN

A standard stipulation on federal leases is that the lessee monitor the effects of underground mining on vegetation. The application includes a plan to monitor vegetation with color infrared photography every five years. This commitment is consistent with commitments other mines have made and is acceptable.

Subsidence Control Plan

- Coal will be removed by room-and-pillar methods. If the demand for coal increases, then longwall methods may be used. Details of the mining plan are given in Section 522 and 523. Plate 5-5 shows the mine layout and the sequence and timing of mining. Room-and-pillar mining can cause subsidence to occur under low overburden cover. R645-301-525.313 states that nothing in the subsidence regulations will prohibit the standard method of room-and-pillar mining.
- On Plate 5-5 the Permittee shows the proposed underground workings and the areas of potential subsidence. Plate 5-5 shows those areas where subsidence control methods (first mining only) will be used to protect escarpments. The Permittee shows the location of the seeps, springs, and eagle nests on Plate 5-3.
- Chapter 6 of the application contains information of the depth of cover, seam thickness and lithology of the permit and nearby areas. The information is sufficient for the Division to use in the analysis of subsidence.
- R645-301-525.440 requires that the Permittee describe the subsidence monitoring plan. The Permittee commits to the following:

Aerial subsidence monitoring will be done annually while the significant subsidence is taking place. The subsidence monitoring will be initiated in an area prior to any 2nd mining being done within that area. Initially a 200 foot grid along with baseline photograph will be established prior to any 2nd mining. Approximately 12-16 control points will be needed to cover the total mining area. Six of these points will be located outside of the subsidence zone. The accuracy of this survey will be plus or minus 6 inches horizontally and vertically. From this data a map will be created that will show subsided areas. Once a year a follow up aerial survey will be performed to determine the extent and degree of active subsidence. Subsidence monitoring will continue for five years after mining stops or until subsidence is complete. If for three years in a row the subsidence is measured to be less than 10 percent of the highest subsidence year, subsidence will be determined to be complete, and no additional monitoring for that area will be required.

OPERATION PLAN

A ground survey will be performed in conjunction with the quarterly water monitoring program. During the normal water monitoring program any cracks observed will be noted and reported to DOG.

The Division agrees with the general concepts in the subsidence monitoring plan. The aerial monitoring program is similar to other programs used by mines in the area. The Division has found that aerial surveys provide good subsidence information. Ground surveys are useful because the ground crews can spot cracks.

Subsidence monitoring will continue for a minimum of 5 years. If for three years in a row the subsidence is measured to be less than 10 percent of the highest subsidence year, subsidence will be determined to be complete, and no additional monitoring for that area will be required.

- The Permittee states that the escarpments at the outcrop will be protected from subsidence by allowing first mining only within 200 feet of the outcrops. The anticipated effects of planned subsidence may include tension cracks, fissures, sinkholes and lowering of the ground surface.

The Permittee considers contingent plans for subsidence. The Permittee states in the amendment that if subsidence causes damage, the land will be restored to a condition capable of maintaining the value and reasonable foreseeable uses that the land was capable of supporting before subsidence.

- The Permittee states that anticipated effects of subsidence may include tension cracks, fissures, or sinkholes and ground lowering. Those subsidence features are typical in Utah when low overburden cover exists. In the past such features have caused some damage that can be mitigated. The main concern with subsidence is damage to wildlife, livestock, people and water loss.

The Division has received comments from the public that subsidence might damage seeps and springs in the area. One landowner near the Lila Canyon project has expressed concern about water loss.

The Permittee has committed in Sections 525.160 and 525.231 of the MRP to restore, to the extent technologically and economically feasible material damage to the surface lands. This commitment is in accordance with regulatory requirements and is considered adequate.

- The Permittee describes measures to be taken to mitigate or remediate any subsidence-related damage in Section 525.

The land will be restored to a condition capable of maintaining the value and reasonable foreseeable uses that it was capable of supporting before the subsidence.

OPERATION PLAN

The Permittee commits to remediate any damage to water rights.

Performance Standards for Subsidence Control

The Permittee is required to meet all the subsidence performance standards.

Notification

At least six months prior to mining, the Permittee will mail a notification to all owners and of surface properties and structures above the proposed underground workings. The notification will include, at a minimum, identification of specific areas in which mining will take place, dates that specific areas will be undermined, and the locations where the Permittee's subsidence control plan may be examined.

Findings:

The Permittee has met the minimum subsidence control requirements of the regulations.

SLIDES AND OTHER DAMAGE

Regulatory Reference: 30 CFR Sec. 817.99; R645-301-515.

Minimum Regulatory Requirements:

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

The permit application will incorporate a description of notification when potential impoundment hazards exist. The requirements for the description are: If any examination or inspection discloses that a potential hazard exists, the person who examined the impoundment will promptly inform the Division of the finding and of the emergency procedures formulated for public protection and remedial action. If adequate procedures cannot be formulated or implemented, the Division will be notified immediately. The Division will then notify the appropriate agencies that other emergency procedures are required to protect the public.

Analysis:

Given the geologic characteristics in the vicinity of the mine, the likelihood of a slide is remote. The Permittee committed to phone the Division if a slide occurred. The Division would then be informed of the remedial plan. The adequacy of the remediation plan will be determined by the Division. The Permittee has also committed to report any potential hazards found during impoundment inspection.

Findings:

The Permittee meets the minimum regulatory requirements for slides and other damage.

FISH AND WILDLIFE INFORMATION

Regulatory Reference: 30 CFR Sec. 784.21, 817.97; R645-301-322, -301-333, -301-342, -301-358.

Minimum Regulatory Requirements:

Protection and enhancement plan

Each application shall include a description of how, to the extent possible using the best technology currently available, the operator will minimize disturbances and adverse impacts on fish and wildlife and related environmental values, including compliance with the Endangered Species Act, during the surface coal mining and reclamation operations and how enhancement of these resources will be achieved where practicable. This description shall apply, at a minimum, to species and habitats identified under R645-301-322. The description shall include: protective measures that will be used during the active mining phase of operation. Such measures may include the establishment of buffer zones, the selective location and special design of haul roads and powerlines, the monitoring of surface-water quality and quantity; and, enhancement measures that will be used during the reclamation and postmining phase of operation to develop aquatic and terrestrial habitat. Such measures may include restoration of streams and other wetlands, retention of ponds and impoundments, establishment of vegetation for wildlife food and cover, and the placement of perches and nest boxes. Where the plan does not include enhancement measures, a statement shall be given explaining why enhancement is not practicable.

Each operator shall, to the extent possible using the best technology currently available: ensure that electric powerlines and other transmission facilities used for, or incidental to, underground mining activities on the permit area are designed and constructed to minimize electrocution hazards to raptors, except where the Division determines that such requirements are unnecessary; locate and operate haul and access roads so as to avoid or minimize impacts on important fish and wildlife species or other species protected by State or Federal law; design fences, overland conveyors, and other potential barriers to permit passage for large mammals except where the Division determines that such requirements are unnecessary; and, fence, cover, or use other appropriate methods to exclude wildlife from ponds which contain hazardous concentrations of toxic-forming materials.

Endangered and threatened species

No underground mining activity shall be conducted which is likely to jeopardize the continued existence of endangered or threatened species listed by the Secretary or which is likely to result in the destruction or adverse modification of designated critical habitats of such species in violation of the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.). The operator shall promptly report to the Division any State- or federally-listed endangered or threatened species within the permit area of which the operator becomes aware. Upon notification, the Division shall consult with appropriate State and Federal fish and wildlife agencies and, after consultation, shall identify whether, and under what conditions, the operator may proceed.

Bald and golden eagles

No underground mining activity shall be conducted in a manner which would result in the unlawful taking of a bald or golden eagle, its nest, or any of its eggs. The operator shall promptly report to the Division any golden or bald eagle nest within the permit area of which the operator becomes aware. Upon notification, the Division shall consult with the U.S. Fish and Wildlife Service and also, where appropriate, the State fish and wildlife agency and, after consultation, shall identify whether, and under what conditions, the operator may proceed.

Nothing in these regulatory requirements shall authorize the taking of an endangered or threatened species or a bald or golden eagle, its nest, or any of its eggs in violation of the Endangered Species Act of 1973, as amended, 16 U.S.C. 1531 et seq., or the Bald Eagle Protection Act, as amended, 16 U.S.C. 668 et seq.

Wetlands and habitats of unusually high value for fish and wildlife

The operator conducting underground mining activities shall avoid disturbances to, enhance where practicable, restore, or replace, wetlands and riparian vegetation along rivers and streams and bordering ponds and lakes. Underground mining activities shall avoid disturbances to, enhance where practicable, or restore habitats of unusually high value for fish and wildlife.

Analysis:

Protection and Enhancement Plan

In Section 333, the application says the major impacts to wildlife in and around the mine will be the loss of habitat during construction and through the life of the mine. It also says most wildlife will either accept the mine or adjust behavior to coexist with the operation.

OPERATION PLAN

Operational impacts, such as collisions with mine-associated vehicles, loss of habitat during the life of the mine, wildlife disturbance, and fragmentation of nearby habitat, are difficult to quantify but would be the greatest impacts from the mine. The USFWS commented that the mine's disturbance would kill most burrowing animals and others that are less mobile. It would also result in habitat fragmentation and dislocation of some animals to less desirable or already-occupied areas. Although wildlife can coexist with mining operations, animals may be forced to adjust their behaviors and may be otherwise stressed in ways that reduce their chances for survival

The Permittee has committed to train mine employees annually on environmental awareness. This will include wildlife protection measures, such as avoidance during stress periods, caution in driving, recognition of threatened or endangered species, and instructions to remove wildlife carcasses well off the road to avoid collisions with scavenging raptors. UDWR will be notified of any large game animals killed on the road, and the Permittee will request that they be moved to safeguard raptors. The Permittee will instruct personnel as to current regulations pertaining to off road vehicle and firearm use.

Suitable mine discharge water will be made available to wildlife. The Permittee will need to ensure the water rights allow for this use and that the water quality is satisfactory. The water rights listed in Table 7-2 indicate the uses are for "mining" and "other." Ensuring that water quality is suitable should be possible through testing required for the discharge permit.

The application discusses the possible benefits of water in the sediment pond to wildlife. The pond will be monitored to assure there are no negative effects to wildlife.

UDWR indicates there are bighorn sheep that use the cliffs above the surface facilities. Use of the area by bighorn sheep may be limited during operations, but Lila Canyon, northeast of the disturbed area, is remote enough to provide refuge for the sheep. UDWR also commented that Lila Canyon, and more particularly the water resources up the canyon are heavily used by chukars, and UDWR thinks the mining operation will displace these birds from the disturbed area. They suggested the Permittee install some guzzlers of a suitable design and said these water sources would greatly benefit chukars and other area wildlife. Bighorn sheep will also benefit from watering structures. The Permittee has agreed to install two guzzlers. Designs are available for guzzlers that blend into the surrounding area extremely well and require almost no maintenance.

The conveyor from the rock tunnel to the run of mine coal stockpile is adequately elevated to not restrict movements by large mammals. Other conveyors are close enough to loadout and other facilities that it is unlikely large mammals will use these areas.

The only fence shown on the surface facilities map would be along the road. It is about 1000 feet long. Big game tend to use drainage corridors for migrational movements, and although there are some minor drainages that come into the surface facilities area, the major drainage in this area is Lila Canyon. The Lila Canyon drainage is to the north of the surface facilities, and any big game movements in this area would not be restricted by the fence. Therefore, the Division has determined the application meets the requirements of R645-301-358.520.

The Permittee commits to use power lines designed using the best technology available to protect raptors from electrocution hazards. The BLM's EA contains power line designs. Based on this information, the Division has determined the application complies with the requirements of R645-301-358.510.

The Permittee has also agreed to participate in a habitat enhancement project on about 70 acres to convert this from pinyon-juniper woodland to shrubs, forbs, and grasses. UDWR believes the conversion from pinyon-juniper to a grass/shrub community would profit both big game and raptors. In their experience, jackrabbit and cottontail rabbit populations increase markedly with this change in vegetation, and they believe this would greatly benefit raptors.

As the mitigation projects are completed, some details should be included in the application or MRP. If this does not happen, it is easy to lose track of what was accomplished. If the Permittee or anyone else visits the mitigation sites, general comments on use should be noted and reported to UDWR and the Division. These are suggestions and are not regulatory requirements.

Endangered and Threatened Species and Bald and Golden Eagles

In a letter dated April 28, 2000, the USFWS concurred with the Division's findings that the project is not likely to affect the southwestern willow flycatcher, the bald eagle, or listed threatened or endangered plant species. Any water depletions from the Upper Colorado River Basin are considered to jeopardize the continued existence or adversely modify the critical habitat of four Colorado River endangered fish species, but depletions are addressed by existing inter-agency Section 7 agreements. No mitigation is required for annual depletions under 100 acre-feet, and since the depletion resulting from the mine is expected to be about 21.3 acre-feet, no mitigation is required at this time.

On July 18, 2001, the Division received correspondence from the USFWS that the area could contain habitat for the Mexican spotted owl, a listed threatened species. A stipulation on the permit requires additional information about whether the area contains suitable habitat for this species. If habitat is found, it will be necessary to modify the operations plan.

The USFWS commented in a letter dated April 14, 1999, that there should be an evaluation of effects on the Colorado pikeminnow (formerly the Colorado squawfish) of a water discharge line to the Price River. This discharge line was apparently proposed early in the planning process for the mine, but it is no longer being planned.

The Permittee commits to establish a one-half mile buffer zone of no disturbance during critical nesting periods for raptors. This is adequate to protect eggs and chicks from abandonment, and this commitment combined with the mitigation discussed above should be adequate for the loss of use of nests near the mine. If any nests are active when the Permittee plans to begin construction, it might be necessary to delay construction until the nesting season has ended.

Two nests shown on Plate 5-3 are on escarpments in the subsidence area and could be lost as a result of subsidence. The Division consulted with the USFWS and the UDWR about the potential loss of nests in the area, and it was agreed the Permittee should commit to providing alternative nest sites if

OPERATION PLAN

a nest is lost as a result of subsidence. In Section 322.220, the application says that if a nest is lost through subsidence, the Permittee will work with the USFWS and the UDWR to analyze the potential and construction of alternative nest sites. This commitment is considered to be adequate.

It is possible the nests that will be undermined could be used in spite of their proximity to the mine. For this reason, it will be necessary to monitor the sites near the time when they would be undermined, and the application contains a commitment to conduct a raptor survey to ensure that raptors or their young will not be adversely affected through any mine-related activity. It might be necessary to preclude birds from using the nests when subsidence is expected. If any previously unknown nests are found during a raptor survey, it may be necessary to develop further protection or mitigation plans.

Since no threatened or endangered species are known to occur in the proposed addition to the permit area, no protection or mitigation measures are needed.

Wetlands and Habitats of Unusually High Value for Fish and Wildlife

The proposed disturbed area is within an area classified as critical winter range for deer and elk, and the application discusses a mitigation plan for the habitat that would be lost during the life of the mine. The "Protection and Mitigation Plan" section of this review discusses this issue further.

There are no wetlands or riparian areas within the proposed addition to the permit area. While there are a few springs in the area, there are no perennial drainages.

Findings:

The application provided an adequate Fish and Wildlife Protection Plan to meet the minimum requirements of the regulations. If habitat for the Mexican spotted owl is found in the permit area, it will be necessary to modify the operations plan.

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-230.

Minimum Regulatory Requirements:

Topsoil removal and storage

All topsoil shall be removed as a separate layer from the area to be disturbed, and segregated. Where the topsoil is of insufficient quantity or of poor quality for sustaining vegetation, the selected overburden materials approved by the Division for use as a substitute or supplement to topsoil shall be removed as a separate layer from the area to be disturbed, and segregated. If topsoil is less than 6 inches thick, the operator may remove the topsoil and the unconsolidated materials immediately below the topsoil and treat the mixture as topsoil.

The Division may choose not to require the removal of topsoil for minor disturbances which occur at the site of small structures, such as power poles, signs, or fence lines; or, will not destroy the existing vegetation and will not cause erosion.

All materials shall be removed after the vegetative cover that would interfere with its salvage is cleared from the area to be disturbed, but before any drilling, blasting, mining, or other surface disturbance takes place.

OPERATION PLAN

Selected overburden materials may be substituted for, or used as a supplement to, topsoil if the operator demonstrates to the Division that the resulting soil medium is equal to, or more suitable for sustaining vegetation than, the existing topsoil, and the resulting soil medium is the best available in the permit area to support revegetation.

Materials removed shall be segregated and stockpiled when it is impractical to redistribute such materials promptly on regraded areas. Stockpiled materials shall: be selectively placed on a stable site within the permit area; be protected from contaminants and unnecessary compaction that would interfere with revegetation; be protected from wind and water erosion through prompt establishment and maintenance of an effective, quick growing vegetative cover or through other measures approved by the Division; and, not be moved until required for redistribution unless approved by the Division.

Where long-term surface disturbances will result from facilities such as support facilities and preparation plants and where stockpiling of materials would be detrimental to the quality or quantity of those materials, the Division may approve the temporary distribution of the soil materials so removed to an approved site within the permit area to enhance the current use of that site until needed for later reclamation, provided that: such action will not permanently diminish the capability of the topsoil of the host site; and, the material will be retained in a condition more suitable for redistribution than if stockpiled.

The Division may require that the B horizon, C horizon, or other underlying strata, or portions thereof, be removed and segregated, stockpiled, and redistributed as subsoil in accordance with the above requirements if it finds that such subsoil layers are necessary to comply with the revegetation.

Analysis:

Chapter 2, Soils, Sections 230 through 234, discusses the soils operation plan for the proposed Lila Canyon Mine. Topsoil salvage and stockpiling and subsoil salvage and protection are reviewed under the following headings in this Analysis:

- Topsoil and Subsoil Removal
- Topsoil Substitutes and Supplements
- Topsoil Storage

Topsoil and Subsoil Removal

Available Soil Resources

The 1998 Order 1 soil survey, Appendix 2-3, identifies 157,600 cubic yards of available soil for salvage from the 48 acre disturbance (average salvage depth is 24 inches). This estimate is based on the entire disturbance area. However approximately 20 acres of ground within the perimeter of the mine facilities area will not be disturbed (48.23 acres of potential disturbance minus the 28.11 acres of ground in bonding calculation = 20 acres.) Plate 2-3, Soil Salvage and Replacement, shows these undisturbed islands within the disturbed area boundary.

The Available Soil Resources Table, Section 232.100 page 11, identifies "actual topsoil salvage" as 52,129 cubic yards from 25.06 acres for an average salvage depth of 15.6 inches.

Soil salvage areas are broken down by soil survey map units and are identified on the Salvageable Soils Map, Appendix A2 of Appendix 2-3, Order 1 soil survey. The Salvageable Soils Map shows each soil survey map unit, soil description sites, and potential salvage depths.

Topsoil Salvage Practices

OPERATION PLAN

In accordance with R645-301-232.300, since the A horizon is less than six inches deep, the upper 6 to 12 inches that consist of both the A and B horizon materials will be salvaged and stored as topsoil. Therefore, the MRP states that "actual topsoil salvage" will be between 6 and 18 inches (see Available Soil Resources table in Section 232.100). Large stones, 36 inches or less, are considered part of the soil layer and are included in the topsoil volume estimates.

Plate 2-3, Soil Salvage and Replacement, shows salvage depth in each map unit. A maximum of 18 inches will be salvaged or down to shale, whichever is less. The Available Soil Resources table in Section 232.100 shows "actual topsoil salvage" as 52,129 cubic yards from 25.06 acres for an average salvage depth of 15.6 inches. The specifics of that table have been excerpted and printed below.

Actual Soil Salvage Volumes

Actual Soil Salvage Areas	Soil Depth (inches)	Acres	Soil Volume (yd ³)
Topsoil* SBG	18	11.12	26,910
Topsoil* VBJ	18	4.46	10,793
Topsoil* XBS	12	4.77	7,698
Topsoil* DSH	18	1.39	3,364
Topsoil* RBL	8	2.56	2,753
Topsoil* RBT	6	0.76	613
Total		25.06	52,129

* A horizons < 6 inches; topsoil defined as top 18 inches. Refer to Available Soil Resources Table, Section 232.100 for classification descriptions.

Topsoil salvage at the proposed exhaust fan site located near the coal outcrop will be stored in a

OPERATION PLAN

berm in the immediate vicinity of the fan installation (Plate 5-2). The proposed fan site is at an elevation of about 6400 feet and is located on a narrow bench, with a slope of about 40 to 45 percent. The soil survey identifies an approximate salvage depth of 6 inches for the RBT soils. The approximately 800 cubic yards of topsoil salvaged and stored in the berm will be protected by seeding and a silt fence (Section 233.100).

Topsoil salvage will occur under the supervision of a soil scientist. Topsoil will be removed from excavation areas and stockpiled prior to construction activity. Any vegetation and boulders that might interfere with topsoil salvage will be removed prior to topsoil removal. According to Section 232.100, boulders of approximately three feet in diameter and larger will be separated from the topsoil. The Permittee estimates there will be about 10,000 cubic yards of these boulders stored above ground, and this volume is in addition to the topsoil volumes. These will be piled or placed at appropriate locations, such as adjacent to roads and pads, but no attempt will be made to collect them into common piles. Rocks less than three feet in diameter will be stored with the topsoil.

Topsoil removal sequence will start from the lower elevations of the site and proceed up slope. The Division encourages salvaging native soils with intrinsic rock content. Using these inherently rocky soils should enhance reclamation success by providing an environment similar to native conditions. Rock content provides for a more stable reclaimed surface, aids in water harvesting and water holding capacity of interstitial soils, and creates wildlife habitat and niches on the surface where surface boulders and larger cobble sized rocks are placed. Every effort should be made to minimize mixing the deeper subsoils containing extremely high rock content with the surface soils and shallow subsoils containing lower amounts of rock..

Surface disturbance will not occur on the acreage identified as "Undisturbed Area." (i.e. Plate 2-3, Soil Salvage and Replacement, shows three undisturbed islands within the disturbed area boundary).

Plate 2-3 shows an access road to and around the topsoil. Soil on this road will be salvaged and stockpiled in a berm around the topsoil pile as stated in Section 232.100 and referred to as a footnote in the Table of Available Soil Resources Section 232.100. The Division understands that the top 18 inches of soil from the VBJ soils will be salvaged and used to form berms around the perimeter of the topsoil storage yard.³ A sign will be posted on this berm to indicate that it is composed of topsoil.

Subsoil Segregation and Salvage Practices

The MRP states that subsoil deeper than 18 inches from Soil Map Units SBG, DSH, and VBJ will not be salvaged and will remain for use as construction fill during grading activities. Although these subsoils will be used as fill, they will be needed during reclamation to re-establish rooting depth potential. The ability of the soil to store moisture from one year to the next in the upper eight feet has been

³ Personal communication between Tom Paluso (Environmental Industrial Service) and Priscilla Burton (DOGM) in March 2001.

OPERATION PLAN

understood for a long time.¹ Studies of plant phenology have clearly shown that plants in arid areas use soil water from increasing depths as the growing season continues, and if there is inadequate rooting depth, production and vegetative cover will decrease.² A good indication of the depth of soil needed is the rooting depth of the plants currently growing on the site, as reported in the Order I Survey and excerpted into the table below.

Comparison of Potential Soil Salvage Depth, Rooting Depth and Subsurface Rock Content

Ma p Uni t	Potential Salvageable Soil Layer (inches)	Depth of Fine Roots* (inches)	Subsurface Rock Within Soil Salvage Layer (percent)
SB G	48	48	10 to 65
VB J	30	18	5 to 65
XB S	12	12	25 to 40
DS H	40	26	<5 to 45
RB L	8	not listed	30
RB T	6	6	35

*Only those soils having fine roots described with a frequency of "many" or "common" were included

The soils have a sandy loam texture, which correlates to an available water holding capacity (AWC) of 0.10 - .13 according to the Soil Conservation Service.³ Laboratory measurement of the AWC

¹ Merrill, Lewis A. 1910. A Report of Seven Years' Investigation of Dry Farming Methods. Utah Agricultural College Experiment Station. Bulletin No. 112.

² Baker, Paul B. 1988. Nutrient and Water Relationships between Crested Wheatgrass and Two Shrub Species. M.S. Thesis. Utah State University. Logan.

³ Erickson, Austin J. 1973. Aids for Estimating Soil Properties Significant to Engineering Interpretations Utah -1973. USDA. Soil Conservation Service.

OPERATION PLAN

agrees with this approximation as most of the soils were rated good before adjusting for coarse fragment content (Appendix C of Appendix 2-3). By Division calculations, the rock fragment content at a depth of 18 - 48 inches averaged about 43 percent for the SBG, VBJ and DSH soils combined. Therefore, the reduction in AWC would be approximately 57 percent of that estimated by texture.⁴ The good AWC value of 0.13 would fall into the fair range of 0.07.

The implications are that because rock content of the soil reduces the Available Water Holding Capacity, the soil must be suitable for plant growth for a depth of at least 48 inches for the roots to scavenge enough water during the hot summer months.

In the case of the SBG, VBJ and DSH soils, the salvage of 18 inches of topsoil will not include critical subsoils required for rooting depth. In accordance with R645-301-232.500, the Division finds that the B horizon and C horizons must be removed to a depth of 48 inches from the SBG and DSH soil map units and a depth of 30 inches from VBJ soils. The subsoils will be segregated, stockpiled, and redistributed as subsoil, because such subsoil layers are necessary to achieve the rooting depth necessary to comply with the revegetation requirements of R645-301-353 through R645-301-357. The Division will allow this subsoil material to be stored within the operations pad, as described in Section 232.100 where it will be protected by a surface of asphalt, concrete or gravel underlain by an impervious membrane (Section 232.500). Furthermore, contamination of this subsoil with shale will not be permitted (Section 232.100, and Section 232.500). Within the RBL and RBT soil areas, Mancos Shale is encountered within 6 - 8 inches. In no case will the Mancos Shale be salvaged with the overlying soils (Section 232.300 and 232.500). All practical precautions will be taken during design, construction, and reclamation to assure that shales or shale material will not be pushed on top of or mixed with un-salvaged subsoils (Section 232.100, and Section 232.500).

The Division recommends that a qualified soil scientist be on site during any pad construction and reclamation. The Division also recommends that pedestals or other survey methods be utilized to ensure subsoil recovery from Soil Map Units SBJ, DSH, and VBJ during pad development (for comparison with the Salvageable Soils Map Appendix A-2) and that volumes and locations of the subsoils as they are stored in the pad be provided with As-Built drawings (Section 232.500).

Adverse Conditions

Section 232.710 says soil will not be removed from the area between the rock slope tunnels and the ROM stockpile due to rockiness and steep slopes. For the same reasons, disturbance will be minimal in this location, with only two bents planned to hold the conveyor. The Division agrees that leaving the soil on the rocky, steep slope is in accordance with R645-232.400.

Measures to protect the undisturbed soil will include:

- Jersey barriers along the perimeter of the ROM stockpile to prevent encroachment of coal onto the undisturbed ground (Section 232.710).

⁴ $AWC_{adj.} = AWC (1 - \% \text{ coarse fragment})$.

OPERATION PLAN

- Quarterly inspections of the undisturbed area (Section 234.220).
- Periodic cleaning of the undisturbed area soil, if the accumulation of coal fines exceeds one inch (Section 232.710 and 234.200).
- A covered conveyor and an enclosed crusher (Plate 5-8).

Additional measures could include a conveyor pan (Section 232.710).

Prevailing winds as reported in Section 724.412 are from west to east at a speed of 2.7 knots or 3.1 mph (knots x 1.1 = mph). Tom Ordh, meteorologist with the DEQ indicated that the open areas such as Castle Valley would have a wind speed of six miles per hour and canyon winds would be faster, perhaps ten miles per hour.⁵ Mr. Ordh indicated that the prevailing winds along the canyon would flow off the plateau. Down in the canyon the wind would be terrain driven. Ordinarily, the winds are upslope in the morning and downslope in the afternoon.

Topsoil Substitutes and Supplements

Sections 224, 231.200, 232.720, 233, and 233.100 thru 233.400 state that no topsoil borrow or substitute topsoil is needed.

Refuse Pile

Plates 5-2 and 7-5 show rock storage areas north of the refuse storage area. As discussed in Section 232.100 of the application, boulders collected during topsoil salvage may be stockpiled in these locations. These boulder storage sites are not refuse disposal sites.

The Permittee uses the term refuse disposal area in many sections of the MRP and the Division considers that term to mean a refuse pile. MSHA does not consider the refuse disposal areas to be refuse piles. However, the Division considers the area where underground coal development waste will be disposed of as a refuse pile because of the following R645-100-200 definitions:

- Underground development waste means waste-rock mixtures of coal, shale, claystone, siltstone, sandstone, limestone, or related materials that are excavated, moved, and disposed of from underground workings in connection with underground coal mining and reclamation activities.
- Refuse pile means a surface deposit of coal mine waste that does not impound water, slurry, or other liquid or semiliquid material.

There is a 3.28 acre refuse disposal area within the mine facilities perimeter, which is designated to hold both rock slope waste and refuse. The portion of the disposal site reserved for refuse is shown on Figure 1, Appendix 5-7 in the DSH soil mapping unit. The Available Soil Resources table in Section 232.100 indicates the potential salvage depth in this unit is 40 inches. According to the plan for the refuse

⁵ Telephone conversation on 5/17/01 between Priscilla Burton (DOGM) and Tom Ordh, meteorologist, Division of Air Quality, Department of Environmental Quality.

pile, 18 inches of soil would be salvaged from the entire refuse pile area, and an additional 30 inches of subsoil would be moved to the side to facilitate burial of the refuse. Subsoils should not be excavated below 48 inches in the DSH soil mapping unit, as there are restrictions to salvage due to high rock contents and salt levels. For this reason, Section 232.500 indicates that pedestals will be utilized during construction to verify soil removal depths.

Topsoil Storage

The topsoil stockpile will be located and protected to avoid contamination and unacceptable compaction. The plan further states that the stockpile surface will be left rough and irregular to increase moisture retention during rainfall and snow melt. Seeding will be done following topsoil placement and after September 15. A silt fence or berm/ditch configuration will be used at the perimeter of the pile to protect against soil loss from water erosion.

Topsoil storage is addressed in several locations in the MRP: Section 231.100 (soil removal); Section 231.400 (pile construction); Section 232.100 and Figure 1 Appendix 5-7 (pile dimensions and storage capacity); Plate 5-2 (location and cross sections); Section 234.230 (mulching and seeding); Table 3-4/3.5 Interim and Final Reclamation Seed Mix (stockpile seed mix).

Topsoil will be salvaged from fan portal disturbance after the break out occurs. This topsoil will be placed downslope of the fan site in a berm around the site (Section 232.700 and Plate 5-2). This topsoil berm will receive the same protection afforded other topsoil stored on the site. A sign will be posted identifying the berm as topsoil. It will be seeded and protected from erosion. A silt fence will be utilized to prevent the topsoil from leaving the site.

Findings:

Information provided in the application is considered adequate to meet the minimum operational topsoil and subsoil requirements of the regulations.

VEGETATION

Regulatory Reference: R645-301-330, -301-331, -301-332.

Minimum Regulatory Requirements:

Each application will contain a plan for protection of vegetation, fish, and wildlife resources throughout the life of the mine. The plan will provide a description of the measures taken to disturb the smallest practicable area at any one time and through prompt establishment and maintenance of vegetation for interim stabilization of disturbed areas to minimize surface erosion. This may include part or all of the plan for final revegetation as described in reclamation plan for revegetation.

For UNDERGROUND COAL MINING AND RECLAMATION ACTIVITIES a description of the anticipated impacts of subsidence on renewable resource lands and how such impact will be mitigated needs to be presented.

Analysis:

All incidental disturbances that will not be used as part of the operations will be revegetated with

OPERATION PLAN

an interim seed mix. Tables 3.4/3.5 presents a seed mix that would be used for both interim and final revegetation. The species in the seed mix should provide adequate erosion protection for both interim and final reclamation.

Section 331 of the application refers to the revegetation plan in Section 340 for further information about revegetation methods. The details of this plan are discussed in the revegetation section of this TA.

The impacts of subsidence are addressed in the section of this TA dealing with subsidence. The Permittee has included a plan to monitor the effects of subsidence on vegetation through color infrared photography every five years.

Findings:

The information provided by the Permittee meets the minimum Vegetation requirements of the regulations.

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: 30 CFR Sec. 784.24, 817.150, 817.151; R645-301-521, -301-527, -301-534, -301-732.

Minimum Regulatory Requirements:**Road classification system**

Each road shall be classified as either a primary road or an ancillary road. A primary road is any road which is: used for transporting coal or spoil; frequently used for access or other purposes for a period in excess of six months; or, to be retained for an approved postmining land use. An ancillary road is any road not classified as a primary road.

Plans and drawings

Each applicant for an underground coal mining and reclamation permit shall submit plans and drawings for each road to be constructed, used, or maintained within the proposed permit area. To ensure environmental protection appropriate for their planned duration and use, including consideration of the type and size of equipment used, the design and construction or reconstruction of roads shall incorporate appropriate limits for grade, width, surface materials, surface drainage control, culvert placement, and culvert size, in accordance with current, prudent engineering practices, and any necessary design criteria established by the Division. The plans and drawings shall:

- 1.) Include a map, appropriate cross sections, design drawings, and specifications for road widths, gradients, surfacing materials, cuts, fill embankments, culverts, bridges, drainage ditches, low-water crossings, and drainage structures;
- 2.) Contain the drawings and specifications of each proposed road that is located in the channel of an intermittent or perennial stream, as necessary for approval of the road by the Division;
- 3.) Contain the drawings and specifications for each proposed ford of perennial or intermittent streams that is used as a temporary route, as necessary for approval of the ford by the Division;
- 4.) Contain a description of measures to be taken to obtain approval of the Division for alteration or relocation of a natural stream channel;
- 5.) Contain the drawings and specifications for each low-water crossing of perennial or intermittent stream channels so that the Division can maximize the protection of the stream; and,
- 6.) Describe the plans to remove and reclaim each road that would not be retained under an approved postmining land use, and the schedule for this removal and reclamation.

Performance standards

All roads road shall be located, designed, constructed, reconstructed, used, maintained, and reclaimed so as to:

- 1.) Control or prevent erosion, siltation, and the air pollution attendant to erosion, including road dust and dust occurring on other exposed surfaces, by measures such as vegetating, watering, using chemical or other dust suppressants, or otherwise stabilizing all exposed surfaces in accordance with current, prudent engineering practices;

OPERATION PLAN

- 2.) Control or prevent damage to fish, wildlife, or other habitat and related environmental values;
- 3.) Control or prevent additional contributions of suspended solids to streamflow or runoff outside the permit area;
- 4.) Neither cause nor contribute to, directly or indirectly, the violation of State or Federal water quality standard applicable to receiving waters;
- 5.) Refrain from seriously altering the normal flow of water in streambeds or drainage channels;
- 6.) Not locate any road in the channel of an intermittent or perennial stream unless specifically approved by the Division. Roads shall be located to minimize downstream sedimentation and flooding;
- 7.) Prevent or control damage to public or private property, including the prevention or mitigation of adverse effects on lands within the boundaries of units of the National Park System, the National Wildlife Refuge System, the National System of Trails, the National Wilderness Preservation System, the Wild and Scenic Rivers System, including designated study rivers, and National Recreation Areas designated by Act of Congress;
- 8.) Use nonacid- and nontoxic-forming substances in road surfacing; and,
- 9.) Maintain all roads to meet the performance standards of this part and any additional criteria specified by the Division. A road damaged by a catastrophic event, such as a flood or earthquake, shall be repaired as soon as is practicable after the damage has occurred.

In addition to the above, primary roads shall meet the following requirements:

- 1.) The construction or reconstruction of primary roads shall be certified in a report to the Division by a qualified registered professional engineer, or in any State which authorizes land surveyors to certify the construction or reconstruction of primary roads, a qualified registered professional land surveyor, with experience in the design and construction of roads. The report shall indicate that the primary road has been constructed or reconstructed as designed and in accordance with the approved plan;
- 2.) Each primary road embankment shall have a minimum static factor of 1.3. The Division may establish engineering design standards for primary roads through the State program approval process, in lieu of engineering tests, to establish compliance with the minimum static safety factor of 1.3 for all embankments;
- 3.) Primary roads shall be located to minimize erosion, insofar as is practicable, on the most stable available surface;
- 4.) Fords of perennial or intermittent streams by primary roads are prohibited unless they are specifically approved by the Division as temporary routes during periods of road construction.
- 5.) Each primary road shall be constructed or reconstructed, and maintained to have adequate drainage control, using structures such as, but not limited to bridges, ditches, cross drains, and ditch relief drains. The drainage control system shall be designed to safely pass the peak runoff from a 10-year, 6-hour precipitation event, or greater event as specified by the Division. Drainage pipes and culverts shall be installed as designed, and maintained in a free and operating condition and to prevent or control erosion at inlets and outlets. Drainage ditches shall be constructed and maintained to prevent uncontrolled drainage over the road surface and embankment. Culverts shall be installed and maintained to sustain the vertical soil pressure, the passive resistance of the foundation, and the weight of vehicles using the road. Natural stream channels shall not be altered or relocated without the prior approval of the Division. Except as specifically approved by the Division, structures for perennial or intermittent stream channel crossings shall be made using bridges, culverts, low-water crossings, or other structures designed, constructed, and maintained using current, prudent engineering practices. The Division shall ensure that low-water crossings are designed, constructed, and maintained to prevent erosion of the structure or streambed and additional contributions of suspended solids to streamflow.
- 6.) Primary roads shall be surfaced with material approved by the Division as being sufficiently durable for the anticipated volume of traffic and the weight and speed of vehicles using the road.

Primary road certification

The plans and drawings for each primary road shall be prepared by, or under the direction of, and certified by a qualified registered professional engineer, or in any State which authorizes land surveyors to certify the design of primary roads a qualified registered professional land surveyor, experienced in the design and construction of roads, as meeting the requirements of this chapter; current, prudent engineering practices; and any design criteria established by the Division.

Other Transportation Facilities

The plan must include a detailed description of each road, conveyor, and rail system to be constructed, used, or maintained within the proposed permit area. The description will include a map, appropriate cross sections, and the following: specifications for each road width, road gradient, road surface, road cut, fill embankment, culvert, bridge, drainage ditch, and drainage structure; measures to be taken to obtain Division approval for alteration or relocation of a natural drainageway; a maintenance plan describing how roads will be maintained throughout their life to meet the design standards throughout their use; a commitment that if a road is damaged by a catastrophic event, such as a flood or earthquake, the road will be repaired as soon as practical after the damage has occurred; a report of appropriate geotechnical analysis, where approval of the Division is required for alternative specifications, or for steep cut slopes.

Analysis:

Road Systems

OPERATION PLAN*Road Classification System*

All roads to be constructed, used and maintained by the Permittee are within the Lila Canyon disturbed area and are shown on Plate 5-2. All of the roads in the disturbed area are classified as primary roads. No ancillary roads are associated with the Lila Canyon project. The information about road classification systems meets the minimum requirements of this subsection.

Plans and Drawings

- In Section 527.200 of the amendment, the Permittee states that detailed designs and descriptions for each road within the disturbed area are included in Appendix 5-4 and all roads are shown on Plate 5-2. The road embankment stability analysis is in Appendix 5-5.

Appendix 5-5 has information about slope stability for the roads. The Permittee states that a slope stability analysis was done for the road embankment and road cut slope. The stability analysis done in Appendix 5-5 shows that the road embankment will have a safety factor of 2.48 under dry conditions and 1.58 for saturated conditions. The road cut slopes will have a safety factor of 1.85 under dry conditions and 1.31 under saturated conditions. The minimum safety factor required for those slopes is 1.30. Thus, the slopes meet or exceed the safety factors of the Utah Coal Rules.

Additional stability analysis was done by the Permittee using STABLE, a slope stability program. The Permittee analyzed several road embankment and cut-slope configurations in the disturbed area. Each cut slope exceeded the minimum safety factor requirement of 1.3.

Primary roads (Fig. 1, Appendix 5-4) are 16 feet wide with a 1 percent slope that drains to a ditch. Roads will have a 6 -inch gravel surface and guard rails. All roads are within the existing facilities pad area and will use the sediment controls in place for the facilities area.

- The Permittee does not propose to locate a road in the channel of an intermittent or perennial stream, or locate a temporary ford in the channel of an intermittent or perennial stream, or install a low-water crossing of a perennial or intermittent stream channel.
- The Permittee does propose to construct temporary culvert UC-1 in an ephemeral channel to accommodate a truck turn-around. Designs are discussed in the hydrology section of this TA. The culvert will be removed during reclamation.
- The Permittee states in Section 542.600 that there will be no roads left after final reclamation within the mine disturbed area. All roads will be reclaimed upon cessation of mining.

Performance Standards

The Permittee will be responsible to insure that the roads meet the performance standards.

Primary Road Certification

The road plans and cross-sections in Appendix 5-5 and Plate 5-2 were certified by a registered professional engineer.

Other Transportation Facilities

The general plans for the conveyor system are given in the text and shown on the surface facilities maps.

Findings:

The information provided by the Permittee meets the minimum Road Systems and Other Transportation Facilities requirements of the regulations.

SPOIL AND WASTE MATERIALS

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

Minimum Regulatory Requirements:

Disposal of noncoal mine wastes

Noncoal mine wastes including, but not limited to, grease, lubricants, paints, flammable liquids, garbage, abandoned mining machinery, lumber, and other combustible materials generated during mining activities shall be placed and stored in a controlled manner in a designated portion of the permit area. Placement and storage shall ensure that leachate and surface runoff do not degrade surface or ground water, that fires are prevented, and that the area remains stable and suitable for reclamation and revegetation compatible with the natural surroundings.

Final disposal of noncoal mine wastes shall be in a designated disposal site in the permit area or a State-approved solid waste disposal area. Disposal sites in the permit area shall be designed and constructed to ensure that leachate and drainage from the noncoal mine waste area does not degrade surface or underground water. Wastes shall be routinely compacted and covered to prevent combustion and windborne waste. When the disposal is completed, a minimum of 2 feet of soil cover shall be placed over the site, slopes stabilized, and revegetated. Operation of the disposal site shall be conducted in accordance with all local, State, and Federal requirements.

At no time shall any noncoal mine waste be deposited in a refuse pile or impounding structure, nor shall any excavation for a noncoal mine waste disposal site be located within 8 feet of any coal outcrop or coal storage area.

Any noncoal mine waste defined as "hazardous" under Section 3001 of the Resource Conservation and Recovery Act (RCRA) (Pub. L. 94-580, as amended) and 40 CFR Part 261 shall be handled in accordance with the requirements of Subtitle C of RCRA and any implementing regulations.

Coal mine waste

Each plan shall contain descriptions, including appropriate maps and cross-section drawings of the proposed disposal methods and sites for placing underground development waste and excess spoil generated at surface areas affected by surface operations and facilities. Each plan shall describe the geotechnical investigation, design, construction, operation, maintenance, and removal, if appropriate, of the structures.

All coal mine waste shall be placed in new or existing disposal areas within a permit area that are approved by the Division for this purpose. Coal mine waste shall be placed in a controlled manner to:

- 1.) Minimize adverse effects of leachate and surface-water runoff on surface- and ground-water quality and quantity;
- 2.) Ensure mass stability and prevent mass movement during and after construction;
- 3.) Ensure that the final disposal facility is suitable for reclamation and revegetation compatible with the natural surroundings and the approved postmining land use;
- 4.) Not create a public hazard; and
- 5.) Prevent combustion.

OPERATION PLAN

Coal mine waste materials from activities located outside a permit area may be disposed of in the permit area only if approved by the Division. Approval shall be based upon a showing that such disposal will be in accordance with the standards of this section.

The disposal facility shall be designed using current, prudent engineering practices and shall meet any design criteria established by the Division. A qualified registered professional engineer, experienced in the design of similar earth and waste structures, shall certify the design of the disposal facility. The disposal facility shall be designed to attain a minimum long-term static safety factor of 1.5. The foundation and abutments must be stable under all conditions of construction. Sufficient foundation investigations, as well as any necessary laboratory testing of foundation material, shall be performed in order to determine the design requirements for foundation stability. The analyses of the foundation conditions shall take into consideration the effect of underground mine workings, if any, upon the stability of the disposal facility.

If any examination or inspection discloses that a potential hazard exists, the Division shall be informed promptly of the finding and of the emergency procedures formulated for public protection and remedial action. If adequate procedures cannot be formulated or implemented the Division shall be notified immediately. The Division shall then notify the appropriate agencies that other emergency procedures are required to protect the public.

Refuse piles

Refuse piles shall meet the requirements of coal mine waste, the additional requirements provided below and the requirements of 30 CFR Sections 77.214 and 77.215.

If the disposal area contains springs, natural or manmade water courses, or wet-weather seeps, the design shall include diversions and underdrains as necessary to control erosion, prevent water infiltration into the disposal facility, and ensure stability. Uncontrolled surface drainage may not be diverted over the outslope of the refuse pile. Runoff from areas above the refuse pile and runoff from the surface of the refuse pile shall be diverted into stabilized diversion channels designed to safely pass the runoff from a 100-year, 6-hour precipitation event. Runoff diverted from undisturbed areas need not be commingled with runoff from the surface of the refuse pile.

Underdrains shall comply with the general requirements for the disposal of excess spoil.

Slope protection shall be provided to minimize surface erosion at the site. All disturbed areas, including diversion channels that are not ripped or otherwise protected, shall be revegetated upon completion of construction.

All vegetative and organic materials shall be removed from the disposal area prior to placement of coal mine waste. Topsoil shall be removed, segregated and stored or redistributed. If approved by the Division, organic material may be used as mulch or may be included in the topsoil to control erosion, promote growth of vegetation, or increase the moisture retention of the soil.

The final configuration of the refuse pile shall be suitable for the approved postmining land use. Terraces may be constructed on the outslope of the refuse pile if required for stability, control of erosion, conservation of soil moisture, or facilitation of the approved postmining land use. The grade of the outslope between terrace benches shall not be steeper than 2h:1v (50 percent).

No permanent impoundments shall be allowed on the completed refuse pile. Small depressions may be allowed by the Division if they are needed to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation, and if they are not incompatible with the stability of the refuse pile.

Following final grading of the refuse pile, the coal mine waste shall be covered with a minimum of 4 feet of the best available, nontoxic and noncombustible material, in a manner that does not impede drainage from the underdrains. The Division may allow less than 4 feet of cover material based on physical and chemical analyses which show that the revegetation requirements will be met.

A qualified registered professional engineer, or other qualified professional specialist under the direction of the professional engineer, shall inspect the refuse pile during construction. The professional engineer or specialist shall be experienced in the construction of similar earth and waste structures. Such inspection shall be made at least quarterly throughout construction and during critical construction periods. Critical construction periods shall include, at a minimum: Foundation preparation including the removal of all organic material and topsoil; Placement of underdrains and protective filter systems; Installation of final surface drainage systems; and, The final graded and revegetated facility. Regular inspections by the engineer or specialist shall also be conducted during placement and compaction of coal mine waste materials. More frequent inspections shall be conducted if a danger of harm exists to the public health and safety or the environment. Inspections shall continue until the refuse pile has been finally graded and revegetated or until a later time as required by the Division.

The qualified registered professional engineer shall provide a certified report to the Division promptly after each inspection that the refuse pile has been constructed and maintained as designed and in accordance with the approved plan and this Chapter. The report shall include appearances of instability, structural weakness, and other hazardous conditions. The certified report on the drainage system and protective filters shall include color photographs taken during and after construction, but before underdrains are covered with coal mine waste. If the underdrain system is constructed in phases, each phase shall be certified separately. The photographs accompanying each certified report shall be taken in adequate size and number with enough terrain or other physical features of the site shown to provide a relative scale to the photographs and to specifically and clearly identify the site. A copy of each inspection report shall be retained at or near the minesite.

Impounding structures

New and existing impounding structures constructed of coal mine waste or intended to impound coal mine waste shall meet the requirements for coal mine waste.

OPERATION PLAN

Coal mine waste shall not be used for construction of impounding structures unless it has been demonstrated to the Division that the stability of such a structure conforms to the requirements of this part and that the use of coal mine waste will not have a detrimental effect on downstream water quality or the environment due to acid seepage through the impounding structure. The stability of the structure and the potential impact of acid mine seepage through the impounding structure shall be discussed in detail in the design plan submitted to the Division.

Each impounding structure constructed of coal mine waste or intended to impound coal mine waste shall be designed, constructed, and maintained in accordance with the requirements for temporary impoundments. Such structures may not be retained permanently as part of the approved postmining land use.

Each impounding structure constructed of coal mine waste or intended to impound coal mine waste that meets the criteria of 30 CFR Sec. 77.216(a) shall have sufficient spillway capacity to safely pass, adequate storage capacity to safely contain, or a combination of storage capacity and spillway capacity to safely control, the probable maximum precipitation of a 6-hour precipitation event, or greater event as specified by the Division. Spillways and outlet works shall be designed to provide adequate protection against erosion and corrosion. Inlets shall be protected against blockage.

Runoff from areas above the disposal facility or runoff from the surface of the facility that may cause instability or erosion of the impounding structure shall be diverted into a stabilized diversion channels designed to safely pass the runoff from a 100-year, 6-hour design precipitation event.

Impounding structures constructed of or impounding coal mine waste shall be designed and function so that at least 90 percent of the water stored during the design precipitation event can be removed within a 10-day period.

Burning and burned waste utilization

Coal mine waste fires shall be extinguished by the person who conducts the surface mining activities, in accordance with a plan approved by the Division and the Mine Safety and Health Administration. The plan shall contain, at a minimum, provisions to ensure that only those persons authorized by the operator, and who have an understanding of the procedures to be used, shall be involved in the extinguishing operations. No burning or unburned coal mine waste shall be removed from a permitted disposal area without a removal plan approved by the Division. Consideration shall be given to potential hazards to persons working or living in the vicinity of the structure.

Return of coal processing waste to abandoned underground workings

Each plan shall describe the design, operation and maintenance of any proposed coal processing waste disposal facility, including flow diagrams and any other necessary drawings and maps, for the approval of the Division and the Mine Safety and Health Administration.

Each plan shall describe the source and quality of waste to be stowed, area to be backfilled, percent of the mine void to be filled, method of constructing underground retaining walls, influence of the backfilling operation on active underground mine operations, surface area to be supported by the backfill, and the anticipated occurrence of surface effects following backfilling.

The applicant shall describe the source of the hydraulic transport mediums, method of dewatering the placed backfill, retainment of water underground, treatment of water if released to surface streams, and the effect on the hydrologic regime.

The plan shall describe each permanent monitoring well to be located in the backfilled area, the stratum underlying the mined coal, and gradient from the backfilled area.

The requirements of this section shall also apply to pneumatic backfilling operations, except where the operations are exempted by the Division from requirements specifying hydrologic monitoring.

Excess Spoil: General Requirements

Excess spoil shall be placed in designated disposal areas within the permit area, in a controlled manner to: minimize the adverse effects of leachate and surfacewater runoff from the fill on surface and ground waters; ensure mass stability and prevent mass movement during and after construction; and, ensure that the final fill is suitable for reclamation and revegetation compatible with the natural surroundings and the approved postmining land use.

The fill and appurtenant structures shall be designed using current, prudent engineering practices and shall meet any design criteria established by the Division. A qualified registered professional engineer experienced in the design of earth and rock fills shall certify the design of the fill and appurtenant structures. The fill shall be designed to attain a minimum long-term static safety factor of 1.5. The foundation and abutments of the fill must be stable under all conditions of construction.

The disposal area shall be located on the most moderately sloping and naturally stable areas available, as approved by the Division, and shall be placed, where possible, upon or above a natural terrace, bench, or berm, if such placement provides additional stability and prevents mass movement.

Sufficient foundation investigations, as well as any necessary laboratory testing of foundation material, shall be performed in order to determine the design requirements for foundation stability. The analyses of foundation conditions shall take into consideration the effect of underground mine workings, if any, upon the stability of the fill and appurtenant structures. When the slope in the disposal area is in excess of 2.8h:1v (36 percent), or such lesser slope as may be designated by the Division based on local conditions, keyway cuts (excavations to stable

OPERATION PLAN

bedrock) or rock toe buttresses shall be constructed to ensure stability of the fill. Where the toe of the spoil rests on a downslope, stability analyses shall be performed to determine the size of rock toe buttresses and keyway cuts.

All vegetative and organic materials shall be removed from the disposal area prior to placement of excess spoil. Topsoil shall be removed, segregated and stored and redistributed in accordance with the requirements for topsoil handling. If approved by the Division, organic material may be used as mulch or may be included in the topsoil to control erosion, promote growth of vegetation, or increase the moisture retention of the soil.

Excess spoil shall be transported and placed in a controlled manner in horizontal lifts not exceeding 4 feet in thickness; concurrently compacted as necessary to ensure mass stability and to prevent mass movement during and after construction; graded so that surface and subsurface drainage is compatible with the natural surroundings; and covered with topsoil or substitute material. The Division may approve a design which incorporates placement of excess spoil in horizontal lifts other than 4 feet in thickness when it is demonstrated by the operator and certified by a qualified registered professional engineer that the design will ensure the stability of the fill and will meet all other applicable requirements.

The final configuration of the fill shall be suitable for the approved postmining land use. Terraces may be constructed on the outslope of the fill if required for stability, control of erosion, to conserve soil moisture, or to facilitate the approved postmining land use. The grade of the outslope between terrace benches shall not be steeper than 2h:1v (50 percent).

No permanent impoundments are allowed on the completed fill. Small depressions may be allowed by the Division if they are needed to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation; and if they are not incompatible with the stability of the fill.

Excess spoil that is acid- or toxic-forming or combustible shall be adequately covered with nonacid, nontoxic and noncombustible material, or treated, to control the impact on surface and ground water, to prevent sustained combustion, and to minimize adverse effects on plant growth and the approved postmining land use.

If the disposal area contains springs, natural or manmade water courses, or wet weather seeps, the fill design shall include diversions and underdrains as necessary to control erosion, prevent water infiltration into the fill, and ensure stability. Underdrains shall consist of durable rock or pipe, be designed and constructed using current, prudent engineering practices and meet any design criteria established by the Division. The underdrain system shall be designed to carry the anticipated seepage of water due to rainfall away from the excess spoil fill and from seeps and springs in the foundation of the disposal area and shall be protected from piping and contamination by an adequate filter. Rock underdrains shall be constructed of durable, nonacid-, nontoxic-forming rock (e.g., natural sand and gravel, sandstone, limestone, or other durable rock) that does not slake in water or degrade to soil materials, and which is free of coal, clay, or other nondurable material. Perforated pipe underdrains shall be corrosion resistant and shall have characteristics consistent with the long-term life of the fill.

Slope protection shall be provided to minimize surface erosion at the site. All distributed areas, including diversion channels that are not ripped or otherwise protected, shall be revegetated upon completion of construction.

A qualified registered professional engineer or other qualified professional specialist under the direction of the professional engineer, shall periodically inspect the fill during construction. The professional engineer or specialist shall be experienced in the construction of earth and rock fills. Such inspections shall be made at least quarterly throughout construction and during critical construction periods. Critical construction periods shall include at a minimum: foundation preparation, including the removal of all organic material and topsoil; placement of underdrains and protective filter systems; installation of final surface drainage systems; and, the final graded and revegetated fill. Regular inspections by the engineer or specialist shall also be conducted during placement and compaction of fill materials. The qualified registered professional engineer shall provide a certified report to the Division promptly after each inspection that the fill has been constructed and maintained as designed and in accordance with the regulatory requirements. The report shall include appearances of instability, structural weakness, and other hazardous conditions. The certified report on the drainage system and protective filters shall include color photographs taken during and after construction, but before underdrains are covered with excess spoil. If the underdrain system is constructed in phases, each phase shall be certified separately. Where excess durable rock spoil is placed in single or multiple lifts such that the underdrain system is constructed simultaneously with excess spoil placement by the natural segregation of dumped materials, color photographs shall be taken of the underdrain as the underdrain system is being formed. The photographs accompanying each certified report shall be taken in adequate size and number with enough terrain or other physical features of the site shown to provide a relative scale to the photographs and to specifically and clearly identify the site. A copy of each inspection report shall be retained at or near the mine site.

Coal mines waste may be disposed of in excess spoil fills if approved by the Division and, if such waste is: placed in accordance with the requirements for refuse piles; nontoxic and nonacid forming; and, of the proper characteristics to be consistent with the design stability of the fill.

Spoil resulting from face-up operations for underground coal mine development may be placed at drift entries as part of a cut-and-fill structure, if the structure is less than 400 feet in horizontal length and designed in accordance with the general requirements for the disposal of excess spoil.

Excess Spoil: Valley fills/head-of-hollow fills

Valley fills and head-of-hollow fills shall meet the general requirements for excess spoil and the following additional requirements.

The top surface of the completed fill shall be graded such that the final slope after settlement will be toward properly designed

OPERATION PLAN

drainage channels. Uncontrolled surface drainage may not be directed over the outslope of the fill. Runoff from areas above the fill and runoff from the surface of the fill shall be diverted into stabilized diversion channels and to safely pass the runoff from a 100-year, 6-hour precipitation event.

A rock-core chimney drain may be used in a head-of-hollow fill, instead of the underdrain and surface diversion system normally required, as long as the fill is not located in an area containing intermittent or perennial streams. A rock-core chimney drain may be used in a valley fill if the fill does not exceed 250,000 cubic yards of material and upstream drainage is diverted around the fill. The alternative rock-core chimney drain system shall be incorporated into the design and construction of the fill as follows:

- 1.) The fill shall have, along the vertical projection of the main buried stream channel or rill, a vertical core of the durable rock at least 16 feet thick which shall extend from the toe of the fill to the head of the fill and from the base of the fill to the surface of the fill. A system of lateral rock underdrains shall connect this rock core to each area of potential drainage or seepage in the disposal area. The underdrain system and rock core shall be designed to carry the anticipated seepage of water due to rainfall away from the excess spoil fill and from seeps and springs in the foundation of the disposal area.
- 2.) A filter system to ensure the proper long-term functioning of the rock core shall be designed and constructed using current, prudent engineering practices.
- 3.) Grading may drain surface water away from the outslope of the fill and toward the rock core. In no case, however, may intermittent or perennial streams be diverted into the rock core. The maximum slope of the top of the fill shall be 33h:1v (3 percent). A drainage pocket may be maintained at the head of the fill during and after construction, to intercept surface runoff and discharge the runoff through or over the rock drain, if stability of the fill is not impaired. In no case shall this pocket or sump have a potential capacity for impounding more than 10,000 cubic feet of water. Terraces on the fill shall be graded with a 3- to 5-percent grade toward the fill and a 1-percent slope toward the rock core.

Excess Spoil: Durable rock fills

The Division may approve the alternative method of disposal of excess durable rock spoil by gravity placement in single or multiple lifts, provided the following conditions are met: durable rock fills shall meet the general requirements for excess spoil except as provided in this section; the excess spoil consists of at least 80 percent, by volume, durable, nonacid- and nontoxic-forming rock (e.g., sandstone or limestone) that does not slake in water and will not degrade to soil material. Where used, noncemented clay shale, clay spoil, soil, or other nondurable excess spoil material shall be mixed with excess durable rock spoil in a controlled manner such that no more than 20 percent of the fill volume, as determined by tests performed by a registered engineer and approved by the Division, is not durable rock; a qualified registered professional engineer certifies that the design will ensure the stability of the fill and meet all other applicable requirements; the fill is designed to attain a minimum long-term static safety factor of 1.5, and an earthquake safety factor of 1.1; the underdrain system may be constructed simultaneously with excess spoil placement by the natural segregation of dumped materials, provided the resulting underdrain system is capable of carrying anticipated seepage of water due to rainfall away from the excess spoil fill and from seeps and springs in the foundation of the disposal area and the other requirements for drainage control are met; and, surface-water runoff from areas adjacent to and above the fill is not allowed to flow onto the fill and is diverted into stabilized diversion channels designed to safely pass the runoff from a 100-year, 6-hour precipitation event.

Excess Spoil: Preexisting benches

The Division may approve the disposal of excess spoil through placement on preexisting benches, provided that the general requirements for excess spoil and the requirements of this section are met.

Excess spoil shall be placed only on the solid portion of the preexisting bench. The fill shall be designed, using current, prudent engineering practices, to attain a long-term static safety factor of 1.3 for all portions of the fill. The preexisting bench shall be backfilled and graded to achieve the most moderate slope possible which does not exceed the angle of repose, and eliminate the highwall to the maximum extent technically practical.

Disposal of excess spoil from an upper actively mined bench to a lower preexisting bench by means of gravity transport may be approved by the Division provided that: the gravity transport courses are determined on a site-specific basis by the operator as part of the permit application and approved by the Division to minimize hazards to health and safety and to ensure that damage will be minimized between the benches, outside the set course, and downslope of the lower bench should excess spoil accidentally move; all gravity-transported excess spoil, including that excess spoil immediately below the gravity transport courses and any preexisting spoil that is disturbed, is rehandled and placed in horizontal lifts in a controlled manner, concurrently compacted as necessary to ensure mass stability and to prevent mass movement, and graded to allow surface and subsurface drainage to be compatible with the natural surroundings and to ensure a minimum long-term static safety factor of 1.3. Excess spoil on the bench prior to the current mining operation that is not disturbed need not be rehandled except where necessary to ensure stability of the fill; a safety berm is constructed on the solid portion of the lower bench prior to gravity transport of the excess spoil. Where there is insufficient material on the lower bench to construct a safety berm, only that amount of excess spoil necessary for the construction of the berm may be gravity transported to the lower bench prior to construction of the berm; and, excess spoil shall not be allowed on the downslope below the upper bench except on designated gravity-transport courses properly prepared by removing topsoil. Upon completion of the fill, no excess spoil shall be allowed to remain on the designated gravity-transport course between the two benches and each transport course shall be reclaimed.

Analysis:

OPERATION PLAN**Disposal of Noncoal Mine Waste**

On December 14, 2001, the Board of Oil, Gas and Mining remanded the Division's decision to issue the permit for the Lila Canyon extension partly because of the lack of data on acid and toxic forming materials. A waiver is allowed and was granted by the Division because of the plan to cover the refuse with four feet of material. The analysis of the refuse material explains why this finding was made and no harm to the environment will occur.

The Permittee on Plate 5-2 showed the location where noncoal waste would be stored. In Section 528.332 the Permittee states that final disposal of noncoal mine wastes except for concrete debris will be at the East Carbon Development Corporation (ECDC) facility near East Carbon City. Plate 5-6 show that the concrete will be disposed of in the coal storage area.

The Division will allow the Permittee to dispose of concrete debris on site. The on site disposal of concrete will be done by placing the concrete in areas that will be backfilled and graded. As shown on Plate 5-6, the Permittee will cover the concrete debris with enough material to allow for proper vegetation growth.

The Permittee committed in Section 528.224 of the application to handle and dispose of all hazardous waste in accordance with Resource Conservation and Recovery Act (RCRA) requirements. ECDC is licensed by the State to dispose of hazardous and nonhazardous waste.

Coal Mine Waste

The Permittee states in Section 528.320 that coal mine waste will be placed in new disposal areas within the permit area. The Permittee will divide the refuse pile into two sections. The first section will contain rock removed from the access tunnels. The rock will be used as structural fill for the shop/warehouse. The second section will be used for coal mine processing waste and underground development waste that contains coal. The location of the refuse pile is shown on Plate 5-2 and in Appendix 5-7.

R645-301-536.100 requires that refuse piles be designed using current, prudent engineering practices. In Appendix 5-7 the Permittee describes the placement of refuse as follows:

"Refuse will be dumped into the hole created from the removal of the subsoil. The refuse will be placed in the hole as per Figure 1. Once the hole is filled to the level shown in Figure 1, the subsoil will then be placed over the top of the refuse and another hole will be constructed by removing subsoil adjacent to the previous hole. The topsoil removal and storage, subsoil removal, the hole being filled with refuse, and subsoil replacement, procedure will be repeated as additional refuse disposal area is needed."

Refuse will be placed in lifts and compacted during the filling operation. Upon final reclamation the topsoil will be redistributed over the refuse storage area and reclaimed as per Chapter 3. The total cover over the refuse area when considering the subsoil and topsoil will be a minimum of 4 feet. The

compaction and four feet of subsoil and topsoil will minimize the effects of leachate and degradation of ground-water quality.

The coal mine waste disposal facility has a static safety factor of 16.19. The minimum static safety required is 1.5. The calculations were made at cross section 8+00.

After the site is backfilled, graded and topsoil is placed the area will be suitable for establishing vegetation and supporting the postmining land use. See the vegetation and postmining land use sections in the reclamation section of this TA for details. The reclaimed site will be stable and not cause a public hazard or be susceptible to combustion.

The Permittee does not propose to place coal mine waste material from other facilities in the coal mine waste disposal facility. If needed, the Permittee can request that the permit be amended.

The Permittee has committed to notify the Division in the event of a potential hazard at the coal mine waste disposal site. See the section of slide and other damage in this TA for details on how the Permittee will handle emergencies.

Refuse Piles

The plan for the refuse pile is in Appendix 5-7, Refuse Piles, and Appendix 5-5, Slope Stability. No springs, water courses or wet weather seeps exist in the refuse piles area. The Permittee committed to remove all vegetation and topsoil during construction. The Permittee does not propose to use terraces for constructing the refuse pile. The pile will be reclaimed by placing 4 feet of material over the refuse. The Permittee committed to having the refuse pile inspected as required in the R645 rules.

Under the definitions in R645-100, the material generated in excavating the rock slopes is considered underground development waste (coal mine waste) that must be disposed of in a refuse pile. The rock in contact with the coal is characterized as fine-to-medium-grained sandstone in the southern portion of the permit area and carbonaceous mudstone and siltstone in the northern portion of the permit area and overlying the lower coal seam in the southern area (Section 6.5.5.1 of the MRP)

In addition to the rock slope material, coal processing waste and other underground development waste (Section 6.6.3.2 B# 005197) will be disposed of in the refuse pile. Appendix 5-7 (B# 005119) indicates that 25,000 CY of refuse will be generated. This refuse will be examined and tested as necessary (Page 82 Section 536 B#005062). Three samples will be taken of the initial rock slope (B#005122) development excavation. These samples will be analyzed according to Table 2 of Appendix 5-7. Testing of mining refuse will occur every 10,000 tons (B#005125) and follow the parameters in Table 2 of Appendix 5-7 (B#005062).

Figure 1 Appendix 5-7 (B#005126) differentiates between structural fill (rock slope waste) and

OPERATION PLAN

refuse. The final burial location for both is approximately 3.28 acres¹. As discussed above, approximately 25,000 cubic yards of rock slope waste will be stored in this location. The area designated for refuse is approximately two acres (300' x 300') and can hold 19,500 cubic yards.

**ACID/TOXIC SURFACE BURIAL
QUICK REFERENCE BY SUBTOPIC**

SubTopic	Bate Stamped Number	Sample Date	Sampler	Laboratory
Summary Coal Characteristics	B#005192	N/A	N/A	N/A
App. 6-2, Typical Core Hole Quality	B#005306 to B#005325	3/15/95	EarthFax Engineering	Commercial Testing & Engineering Co., Denver Laboratory 4665 Paris B-200 Denver CO 80239
App. D of App. 2-3, Soil Field Notes	B#004640 to B#004660	8/5/98 to 9/8/98	Mr. Dan Larsen Environmental Industrial Services 31 North Main St. Helper, UT 84526	N/A
Soils Map	B# 004621	Jan 1999	Mr. Dan Larsen	N/A
App. C of App. 2-3, Soil Laboratory Testing	B#004634 to B#004639	9/19/98	N/A	Inter-Mountain Laboratories Farmington, NM 87401

**ACID/TOXIC EROSION AND DRAINAGE CONTROL
QUICK REFERENCE BY SUBTOPIC**

SubTopic	Bate Stamped Number
Operations Drainage Control	B#005668-9 and Plate 7-5 which is B#005663, B#000716-8
Operations Plan Erosion Control	B#005123, B#005126-7, B#000716-8
Reclamation Plan Erosion control	B#005132-3, B#000737, B#000746, B#000749-53
Erosion Control Success Standards	B#004504, B#000751-3

As required by R645-301-553.252, the MRP plans for four feet of cover over the refuse pile (section 232.500, B# 004495; and Appendix 5-7, B#005119.) The Division approves of this procedure based upon the limited amount of water that will infiltrate through the four feet of fill cover and the neutralization capacity of the soil encapsulating the waste. The Division's thought process is as outlined:

I. Regulatory Requirement

¹ As per telephone conversation between Priscilla Burton and Tom Paluso, Engineer with Environmental Industrial Services on 5/22/01, there are 1.35 acres designated for rock slope waste and 1.93 acres designated for refuse.

a.. Utah Regulation R645-301-553.252 requires burial of coal mine waste under four feet of cover.

b. Mine waste brought to the surface will be sampled for potential acid/toxic characteristics according to R645-301-731.311 and buried under four feet of cover (B#005122 and 005125).

2. A limited amount of water will infiltrate through the four feet of cover.

a.. Climate is 13.69 inches of precipitation annually, MRP B#005349, with most of the precipitation occurring in the spring and fall (Table 7-1A, B#005351).

b. Refuse will be slightly compacted and graded to limit water infiltration (App 5-7, B#005123 and Figures 1 and 2 of App. 5-7, B#005126 and 005127).

c. The Order I Soil Survey indicated in the field notes of Appendix D of Appendix 2-3, B#004640, that fine roots were noted at a frequency described as many or common at a depth of forty-eight inches in the SBG map unit, but not below. The depth of fine roots in the DSH unit at the many and common frequency was twenty-six inches. The depth where fine roots were described as many and common in the VBJ, XBS and RBT soils was between six and eighteen inches. The Division summarized this information in the Technical Analysis of July 19, 2001 (B#000688). The Division presumes that the fine roots cease to be common or many in frequency below these depths due to limited water availability.

3. Acidic waste coming in contact with water will be effectively neutralized by the soil encapsulating it:

a. Oxidation of pyrite creates sulfuric acid. The acidity can be neutralized as it comes in contact with calcium carbonate. The calcium carbonate dissolves as the acid is consumed. In an open system, the end products of the reaction between calcium carbonate and hydrogen ions are calcium, carbon dioxide gas and water. Two moles of calcite neutralize the acidity from one mole of pyrite. This is the basis for the Acid/Base Accounting, commonly employed in the mine industry. The acid generation potential is calculated as the neutralization potential minus the acidification potential. When the neutralization potential is greater than the acidification potential, the resulting acid generating potential is a positive value. All units are reported in tons of calcium carbonate per 1,000 tons of material. In the Acid/Base account, the percent sulfur is multiplied by 31.25 to equal the Maximum Potential Acidity in tons/thousand tons calcium carbonate equivalent.²² Mine waste containing 1% sulfur would require 31.25 tons/1000 tons of overburden to be neutralized in an open system.

b. Total Sulfur in the coal is expected to be 1.1 to 1.3%, one-third of which is pyritic sulfur (MRP, Section 6.5.4.2, B#005192). This amount of total sulfur is equivalent to 34.38 to 40.63 Tons/1000 Tons Potential Acidity.

c. Cover encapsulating the waste will be topsoil and subsoil. The soil is described in the

²²U.S. EPA, 1978, EPA 600/278-054. Method 3.2.3, pp47-55 and Method 3.2.6 pg 60.

OPERATION PLAN

MRP as "generally increasing in carbonates below twelve inches in depth." (B#004489). The soil reaction was strongly to violently effervescent at depth (Appendix D of App. 2-3, B#004640 and App. A1 Detailed Soil Survey, B#004621), indicating the presence of calcium carbonate. The Order I Soil Survey analytical information indicates that below forty eight inches in depth, the subsoil contains 6.9 - 20 % CaCO₃. Further, a calcic horizon (greater than 15% CaCO₃) was identified in the Strych Bouldery fine sandy loam in the location of the refuse disposal area (pedon LC1 with 20% CaCO₃, Appendix C of Appendix 2-3, B#004634). The percent calcium carbonate of the refuse site soils equates to 200 Tons/1000 Tons³ which would adequately neutralize the 40 Tons/1000 Tons of Potential Acidity generated by the mine waste (see 3b above for sulfur acid/base accounting), assuming the amount of sulfur in the mine waste is similar to the amount of sulfur in the coal.

The procedure for the creation of the structural fill is as follows:

1. Topsoil will be salvaged to a depth of 18 inches and stored in the stockpile.
2. The subsoil will be excavated an additional 30 inches and pushed to the side.
3. Refuse material will be placed in the excavated four foot pit created from the subsoil removal (Section 232.500 B# 004495 and Appendix 5-7 B# 005119).
4. Once the pit is filled, the subsoil will be placed over the top of the refuse.
5. A second pit will be excavated in the same manner adjacent to the previous pit.

The topsoil removal and storage, subsoil removal, refuse placement, and subsoil replacement procedures will be repeated, as additional refuse disposal is needed.

This process is shown in Figure 2, Appendix 5-7 (B# 005127). From this figure, one can see that although the excavation is only 4 feet deep, refuse will be placed 15 to 19 feet deep and that refuse placement will actually exceed the initial surface elevation to create a mound which is level on its surface. Figure 2, Appendix 5-7 (B# 005127) shows cross sections and a profile of the rock slope/refuse pile. The perimeter of the pile is graded at a 10h:1v slope into the surrounding terrain.

~~The reclaimed refuse pile will be compatible with the postmining land use, see the Postmining Land Use section of the TA for details. No impoundments will be constructed on top of the refuse pile. Terraces will not be constructed on the refuse pile. The Permittee is required to conduct inspections as outlined in R645-301-514.~~

Impounding Structures

The Permittee does not propose to construct any impoundments from coal mine waste.

³Personal communication on 12/21/01 from Jeff Goats, Soils Laboratory Supervisor, Intermountain Laboratories, Inc.

Burning and Burned Waste Utilization

The plan to extinguish coal mines fire is in Appendix 5-3.

Return of Coal Processing Waste to Abandoned Underground Workings

The Permittee does not propose to dispose of coal mine waste underground.

Excess Spoil

The Permittee does not anticipate that any excess spoil will be generated.

Findings:

The reclaimed refuse pile will be compatible with the postmining land use, see the Postmining Land Use section of the TA for details. No impoundments will be constructed on top of the refuse pile. Terraces will not be constructed on the refuse pile. The Permittee is required to conduct inspections as outlined in R645-301-514.

~~The Permittee met the minimum spoil and waste materials requirements of the regulations.~~

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

Minimum Regulatory Requirements:

General

All underground mining and reclamation activities shall be conducted to minimize disturbance of the hydrologic balance within the permit and adjacent areas, to prevent material damage to the hydrologic balance outside the permit area, and to support approved postmining land uses in accordance with the terms and conditions of the approved permit and the performance standards of this part. The Division may require additional preventative, remedial, or monitoring measures to assure that material damage to the hydrologic balance outside the permit area is prevented. Mining and reclamation practices that minimize water pollution and changes in flow shall be used in preference to water treatment.

Ground-water Monitoring

In order to protect the hydrologic balance underground mining activities shall be conducted according to the hydrologic reclamation plan. Ground-water quality shall be protected by handling earth materials and runoff in a manner that minimizes acidic, toxic, or other harmful infiltration to ground-water systems and by managing excavations and other disturbances to prevent or control the discharge of pollutants into the ground water.

Ground-water monitoring shall be conducted according to the ground-water monitoring plan. The Division may require additional monitoring when necessary. Ground-water monitoring data shall be submitted every 3 months to the Division or more frequently as prescribed by the Division. Monitoring reports shall include analytical results from each sample taken during the reporting period. When the analysis of any ground-water sample indicates noncompliance with the permit conditions, the operator shall promptly notify the Division and immediately provide for any accelerated or additional monitoring necessary to determine the nature and extent of noncompliance and the results of the noncompliance. Plans and hydrologic information to evaluate and mitigate the noncompliance situation and information relevant to the PHC shall be submitted to the Division as required.

OPERATION PLAN

Ground-water monitoring shall proceed through mining and continue during reclamation until bond release. The Division may modify the monitoring requirements including the parameters covered and the sampling frequency if the operator demonstrates, using the monitoring data obtained, that: the operation has minimized disturbance to the prevailing hydrologic balance in the permit and adjacent areas and prevented material damage to the hydrologic balance outside the permit area; water quantity and quality are suitable to support approved postmining land uses; or, monitoring is no longer necessary to achieve the purposes set forth in the monitoring plan.

Equipment, structures, and other devices used in conjunction with monitoring the quality and quantity of ground water onsite and offsite shall be properly installed, maintained, and operated and shall be removed by the operator when no longer needed.

Surface-water Monitoring

In order to protect the hydrologic balance, underground mining activities shall be conducted according to the approved plan, and the following: surface-water quality shall be protected by handling earth materials, ground-water discharges, and runoff in a manner that minimizes the formation of acidic or toxic drainage; prevents, to the extent possible using the best technology currently available, additional contribution of suspended solids to streamflow outside the permit area; and otherwise prevent water pollution. If drainage control, restabilization and revegetation of disturbed areas, diversion of runoff, mulching, or other reclamation and remedial practices are not adequate to meet water-quality standards and effluent limitations, the operator shall use and maintain the necessary water-treatment facilities or water-quality controls. Surface-water quantity and flow rates shall be protected by handling earth materials and runoff in accordance with the steps outlined in the approved plan.

Surface-water monitoring shall be conducted according to the approved surface-water monitoring plan. The Division may require additional monitoring when necessary. Surface-water monitoring data shall be submitted every 3 months to the Division or more frequently as prescribed by the Division. Monitoring reports shall include analytical results from each sample taken during the reporting period. When the analysis of any surface-water sample indicates noncompliance with the permit conditions, the operator shall promptly notify the Division and immediately provide for any accelerated or additional monitoring necessary to determine the nature and extent of noncompliance and the results of the noncompliance. Plans and hydrologic information to evaluate and mitigate the noncompliance situation and information relevant to the PHC shall be submitted to the Division as required. The reporting requirements of the water monitoring plan do not exempt the operator from meeting any National Pollutant Discharge Elimination System (NPDES) reporting requirements.

Surface-water monitoring shall proceed through mining and continue during reclamation until bond release. The Division may modify the monitoring requirements, except those required by the NPDES permitting authority, including the parameters covered and sampling frequency if the operator demonstrates, using the monitoring data obtained, that: the operation has minimized disturbance to the hydrologic balance in the permit and adjacent areas and prevented material damage to the hydrologic balance outside the permit area; water quantity and quality are suitable to support approved postmining land uses; and, monitoring is no longer necessary to achieve the purposes set forth in the approved monitoring plan.

Equipment, structures, and other devices used in conjunction with monitoring the quality and quantity of surface water onsite and offsite shall be properly installed, maintained, and operated and shall be removed by the operator when no longer needed.

Acid- and toxic-forming materials and underground development waste

Drainage from acid- and toxic-forming materials and underground development waste into surface water and ground water shall be avoided by: identifying and burying and/or treating, when necessary, materials which may adversely affect water quality, or be detrimental to vegetation or to public health and safety if not buried and/or treated; and, storing materials in a manner that will protect surface water and ground water by preventing erosion, the formation of polluted runoff, and the infiltration of polluted water.

Discharges into an underground mine

Discharges into an underground mine are prohibited, unless specifically approved by the Division after a demonstration that the discharge will: minimize disturbance to the hydrologic balance on the permit area, prevent material damage outside the permit area and otherwise eliminate public hazards resulting from underground mining activities; not result in a violation of applicable water quality standards or effluent limitations; be at a known rate and quality which shall meet the effluent limitations for pH and total suspended solids, except that the pH and total suspended solids limitations may be exceeded, if approved by the Division; and, meet with the approval of the Mine Safety and Health Administration.

Discharges shall be limited to the following: water; coal-processing waste; fly ash from a coal-fired facility; sludge from an acid-mine-drainage treatment facility; flue-gas desulfurization sludge; inert materials used for stabilizing underground mines; and, underground mine development wastes.

Water from one underground mine may be diverted into other underground workings according to the requirements of this section.

Gravity discharges from underground mines

Surface entries and accesses to underground workings shall be located and managed to prevent or control gravity discharge of water from the mine. The surface entries and accesses of drift mines first used after the implementation of a State, Federal, or Federal Lands Program and located in acid-producing or iron-producing coal seams shall be located in such a manner as to prevent any gravity discharge from the mine. Gravity discharges of water from an underground mine first used before the implementation of a State, Federal, or Federal Lands Program, may be allowed by the Division if it is demonstrated that the untreated or treated discharge complies with the performance standards and any additional NPDES permit requirements.

Water-quality standards and effluent limitations

OPERATION PLAN

Compliance with all applicable State and Federal water quality laws and regulations and with the effluent limitations for coal mining promulgated by the U.S. Environmental Protection Agency set forth in 40 CFR Part 434.

OPERATION PLAN

Diversions: General

With the approval of the Division, any flow from mined areas abandoned before May 3, 1978, and any flow from undisturbed areas or reclaimed areas, after meeting the criteria for siltation structure removal, may be diverted from disturbed areas by means of temporary or permanent diversions. All diversions shall be designed to minimize adverse impacts to the hydrologic balance within the permit and adjacent areas, to prevent material damage outside the permit area and to assure the safety of the public. Diversions shall not be used to divert water into underground mines without approval of the Division.

The diversion and its appurtenant structures shall be designed, located, constructed, and maintained to: be stable; provide protection against flooding and resultant damage to life and property; prevent, to the extent possible using the best technology currently available, additional contributions of suspended solids to streamflow outside the permit area; and, comply with all applicable local, State, and Federal laws and regulations.

Temporary diversions shall be removed when no longer needed to achieve the purpose for which they were authorized. The land disturbed by the removal process shall be restored. Before diversions are removed, downstream water-treatment facilities previously protected by the diversion shall be modified or removed, as necessary, to prevent overtopping or failure of the facilities. This requirement shall not relieve the operator from maintaining water-treatment facilities as otherwise required.

A permanent diversion or a stream channel reclaimed after the removal of a temporary diversion shall be designed and constructed so as to restore or approximate the premining characteristics of the original stream channel including the natural riparian vegetation to promote the recovery and the enhancement of the aquatic habitat. The Division may specify additional design criteria for diversions.

Diversions: Perennial and intermittent streams

Diversion of perennial and intermittent streams within the permit area may be approved by the Division after making the finding relating to stream buffer zones that the diversions will not adversely affect the water quantity and quality and related environmental resources of the stream. The design capacity of channels for temporary and permanent stream channel diversions shall be at least equal to the capacity of the unmodified stream channel immediately upstream and downstream from the diversion. Protection against flooding and resultant damage to life and property shall be met when the temporary and permanent diversions for perennial and intermittent streams are designed so that the combination of channel, bank and flood-plain configuration is adequate to pass safely the peak runoff of a 10-year, 6-hour precipitation event for a temporary diversion and a 100-year, 6-hour precipitation event for a permanent diversion. The design and construction of all stream channel diversions of perennial and intermittent streams shall be certified by a qualified registered professional engineer as meeting the performance standards and any design criteria set by the Division.

Diversions: Miscellaneous flows

Diversion of miscellaneous flows, which consist of all flows except for perennial and intermittent streams, may be diverted away from disturbed areas if required or approved by the Division. Miscellaneous flows shall include ground-water discharges and ephemeral streams. The design, location, construction, maintenance, and removal of diversions of miscellaneous flows shall meet all of the general performance standards of this section. Protection against flooding and resultant damage to life and property shall be met when the temporary and permanent diversions for miscellaneous flows are designed so that the combination of channel, bank and flood-plain configuration is adequate to pass safely the peak runoff of a 2-year, 6-hour precipitation event for a temporary diversion and a 10-year, 6-hour precipitation event for a permanent diversion.

Stream buffer zones

No land within 100 feet of a perennial stream or an intermittent stream shall be disturbed by underground mining activities, unless the Division specifically authorizes underground mining activities closer to, or through, such a stream. The Division may authorize such activities only upon finding that: underground mining activities will not cause or contribute to the violation of applicable State or Federal water quality standards and will not adversely affect the water quantity and quality or other environmental resources of the stream; and, if there will be a temporary or permanent stream-channel diversion, it will comply with the regulatory requirements for diversions.

The area not to be disturbed shall be designated as a buffer zone, and the operator shall mark it accordingly with buffer zone markers.

Sediment control measures

Appropriate sediment control measures shall be designed, constructed, and maintained using the best technology currently available to: prevent, to the extent possible, additional contributions of sediment to stream flow or to runoff outside the permit area; meet the more stringent of applicable State or Federal effluent limitations; and, minimize erosion to the extent possible.

Sediment control measures include practices carried out within and adjacent to the disturbed area. The sedimentation storage capacity of practices in and downstream from the disturbed areas shall reflect the degree to which successful mining and reclamation techniques are applied to reduce erosion and control sediment. Sediment control measures consist of the utilization of proper mining and reclamation methods and sediment control practices, singly or in combination. Sediment control methods include but are not limited to: disturbing the smallest practicable area at any one time during the mining operation through progressive backfilling, grading, and prompt revegetation; stabilizing the backfilled material to promote a reduction of the rate and volume of runoff; retaining sediment within disturbed areas; diverting runoff away from disturbed areas; diverting runoff using protected channels or pipes through disturbed areas so as not to cause additional erosion; using straw dikes, riprap, check dams, mulches, vegetative sediment filters, dugout ponds, and other measures that reduce overland flow velocity, reduce runoff volume, or trap sediment; treating with chemicals; and, treating mine drainage in underground sumps.

Siltation Structures: General

OPERATION PLAN

All surface drainage from disturbed areas shall be passed through a siltation structure before leaving the permit area. Siltation structures shall mean a sedimentation pond, a series of sedimentation ponds, or other treatment facility. Other treatment facilities means any chemical treatments, such as flocculation, or mechanical structures, such as clarifiers, that have a point-source discharge and that are utilized to prevent additional contribution of suspended solids to streamflow or runoff outside the permit area.

Disturbed area requiring treatment through a siltation structure shall not include those areas in which the only underground mining activities include: diversion ditches, siltation structures, or roads that are designed, constructed and maintained in accordance with the regulatory requirements; and, for which the upstream area is not otherwise disturbed by the operator.

Additional contributions of suspended solids and sediment to streamflow or runoff outside the permit area shall be prevented to the extent possible using the best technology currently available. Siltation structures for an area shall be constructed before beginning any underground mining activities in that area, and upon construction shall be certified by a qualified registered professional engineer, or when authorized under the regulations, by a qualified registered professional land surveyor, to be constructed as designed and as approved in the reclamation plan.

Any siltation structure which impounds water shall be designed, constructed and maintained in accordance with the requirements for impoundments.

Siltation structures shall be maintained until removal is authorized by the Division and the disturbed area has been stabilized and revegetated. In no case shall the structure be removed sooner than 2 years after the last augmented seeding. When the siltation structure is removed, the land on which the siltation structure was located shall be regraded and revegetated in accordance with the reclamation plan. Sedimentation ponds approved by the Division for retention as permanent impoundments may be exempted from this requirement.

Any point-source discharge of water from underground workings to surface waters which does not meet effluent limitations shall be passed through a siltation structure before leaving the permit area.

Siltation Structures: Sedimentation ponds

Sedimentation ponds, when used, shall: be used individually or in series; be located as near as possible to the disturbed area and out of perennial streams unless approved by the Division; and, be designed, constructed, and maintained to:

- 1.) Provide adequate sediment storage volume;
- 2.) Provide adequate detention time to allow the effluent from the ponds to meet State and Federal effluent limitations;
- 3.) Contain or treat the 10-year, 24-hour precipitation event ("design event") unless a lesser design event is approved by the Division based on terrain, climate, other site-specific conditions and on a demonstration by the operator that the effluent limitations will be met;
- 4.) Provide a nonlogging dewatering device adequate to maintain the required time;
- 5.) Minimize, to the extent possible, short circuiting;
- 6.) Provide periodic sediment removal sufficient to maintain adequate volume for the design event;
- 7.) Ensure against excessive settlement;
- 8.) Be free of sod, large roots, frozen soil, and acid- or toxic-forming coal-processing waste; and
- 9.) Be compacted properly.

A sedimentation pond shall include either a combination of principal and emergency spillways or a single open-channel spillway configured as specified in this section, designed and constructed to safely pass the applicable design precipitation event. The Division may approve a single open-channel spillway that is: of nonerodible construction and designed to carry sustained flows; or earth- or grass-lined and designed to carry short-term infrequent flows at non-erosive velocities where sustained flows are not expected.

The required design precipitation event for a sedimentation pond meeting the spillway requirements of this section is: for a sedimentation pond meeting the size or other criteria of 30 CFR Sec. 77.216(a), a 100-year 6-hour event, or greater event as specified by the Division; or, for a sedimentation pond not meeting the size or other criteria of 30 CFR Sec. 77.216(a), a 25-year 6-hour event, or greater event as specified by the Division.

In lieu of meeting the above spillway requirements, the Division may approve a sedimentation pond that relies primarily on storage to control the runoff from the design precipitation event when it is demonstrated by the operator and certified by a qualified registered professional engineer or, as applicable, a qualified registered professional land surveyor that; the sedimentation pond will safely control the design precipitation event; the water from which shall be safely removed in accordance with current, prudent, engineering practices; and, such a sedimentation pond shall be located where failure would not be expected to cause loss of life or serious property damage. If the sediment pond is located where failure would be expected to cause loss of life or serious property damage, a sedimentation pond that relies primarily on storage to control the runoff from the design precipitation event may be allowed if, in addition to the design event, is: in the case of a sedimentation pond meeting the size or other criteria of 30 CFR Sec. 77.216(a), designed to control the precipitation of the probable maximum precipitation of a 6-hour event, or greater event as specified by the Division; or, in the case of a sedimentation pond not meeting the size or other criteria of 30 CFR Sec. 77.216(a), designed to control the precipitation of a 100-year 6-hour event, or greater event as specified by the Division.

Siltation Structures: Other treatment facilities

Other treatment facilities shall be designed to treat the 10-year, 24-hour precipitation even unless a lesser design event is approved by the Division based on terrain, climate, other site-specific conditions and a demonstration by the operator that the effluent limitations will be met. Other treatment facilities shall be designed, constructed and maintained accordance with the applicable requirements as described under sediment ponds.

OPERATION PLAN**Siltation Structures: Exemptions**

Exemptions to the requirements of this section may be granted if: the disturbed drainage area within the total disturbed area is small; and, the operator demonstrates that siltation structures and alternate sediment control measures are not necessary for drainage from the disturbed drainage areas to meet effluent limitations and applicable State and Federal water-quality standards for the receiving waters.

Discharge structures

Discharge from sedimentation ponds, permanent and temporary impoundments, coal processing waste dams and embankments, and diversions shall be controlled, by energy dissipators, riprap channels, and other devices, where necessary, to reduce erosion, to prevent deepening or enlargement of stream channels, and to minimize disturbance of the hydrologic balance. Discharge structures shall be designed according to standard engineering design procedures.

Impoundments

The following requirements apply to both temporary and permanent impoundments:

- 1.) An impoundment meeting the size or other criteria of 30 CFR Sec. 77.216(a) shall comply with the requirements of 30 CFR Sec. 77.216 and this section.
- 2.) The design of impoundments shall be certified as designed to meet the requirements of the regulations using current, prudent, engineering practices and any design criteria established by the Division. The qualified, registered, professional engineer or qualified, registered, professional, land surveyor shall be experienced in the design and construction of impoundments.
- 3.) An impoundment meeting the size or other criteria of 30 CFR Sec. 77.216(a) or located where failure would be expected to cause loss of life or serious property damage shall have a minimum static safety factor of 1.5 for a normal pool with steady state seepage saturation conditions, and a seismic safety factor of at least 1.2. Impoundments not meeting the size or other criteria of 30 CFR Sec. 77.216(a), except for a coal mine waste impounding structure, and located where failure would not be expected to cause loss of life or serious property damage shall have a minimum static safety factor of 1.3 for a normal pool with steady state seepage saturation conditions. For an impoundment not meeting the size of other criteria of 30 CFR Sec. 77.216(a), where failure would not be expected to cause loss of life or serious property damage, the Division may establish engineering design standards that ensure stability comparable to a 1.3 minimum static safety factor in lieu of engineering tests to establish compliance with the minimum static safety factor of 1.3.
- 4.) Impoundments shall have adequate freeboard to resist overtopping by waves and by sudden increases in storage volume.
- 5.) Foundations and abutments for an impounding structure shall be stable during all phases of construction and operation and shall be designed based on adequate and accurate information on the foundation conditions. For an impoundment meeting the size or other criteria of 30 CFR Sec. 77.216(a), foundation investigation, as well as any necessary laboratory testing of foundation material, shall be performed to determine the design requirements for foundation stability. All vegetative and organic materials shall be removed and foundations excavated and prepared to resist failure. Cutoff trenches shall be installed if necessary to ensure stability.
- 6.) Slope protection shall be provided to protect against surface erosion at the site and protect against sudden drawdown.
- 7.) Faces of embankments and surrounding areas shall be vegetated, except that faces where water is impounded may be riprapped or otherwise stabilized in accordance with accepted design practices.
- 8.) Spillways. An impoundment shall include either a combination of principal and emergency spillways, a single open-channel spillway, or, be configured as an impoundment that relies primarily on storage to control the runoff from the applicable design precipitation event. The Division may approve a single open-channel spillway that is: of nonerodible construction and designed to carry sustained flows; or, earth- or grass-lined and designed to carry short-term, infrequent flows at non-erosive velocities where sustained flows are not expected. Except impoundments that rely primarily on storage to control the runoff, the required design precipitation events for an impoundment having spillways are: for an impoundment meeting the size or other criteria of 30 CFR Sec. 77.216(a) a 100-year 6-hour event, or greater event as specified by the Division; and, for an impoundment not meeting the size or other criteria of 30 CFR Sec. 77.216(a), a 25-year 6-hour event, or greater event as specified by the Division. In lieu of meeting the single open-channel spillway requirements, the Division may approve an impoundment that relies primarily on storage to control the runoff from the design precipitation event when it is demonstrated by the operator and certified by a qualified registered professional engineer or qualified registered professional land surveyor that the impoundment will safely control the design precipitation event, the water from which shall be safely removed in accordance with current, prudent, engineering practices. Such an impoundment shall be located where failure would not be expected to cause loss of life or serious property damage, except where: in the case of an impoundment meeting the size or other criteria of 30 CFR Sec. 77.216(a), it is designed to control the precipitation of the probable maximum precipitation of a 6-hour event, or greater event as specified by the Division; or, in the case of an impoundment not meeting the size or other criteria of 30 CFR Sec. 77.216(a), it is designed to control the precipitation of a 100-year-6-hour event, or greater event as specified by the Division.
- 9.) The vertical portion of any remaining highwall shall be located far enough below the low-water line along the full extent of highwall to provide adequate safety and access for the proposed water users.
- 10.) Inspections. Except as provided in paragraph (a)(10)(iv) of this section, a qualified registered professional engineer or other qualified professional specialist under the direction of a professional engineer, shall inspect each impoundment as provided in paragraph (a)(10)(i) of this section. The professional engineer or specialist shall be experienced in the construction of impoundments.

Inspections shall be made regularly during construction, upon completion of construction, and at least yearly until removal of the structure or release of the performance bond. The qualified registered professional engineer, or qualified registered professional land surveyor as applicable, shall promptly after each inspection provide to the Division a certified report that the impoundment has been constructed and/or maintained as designed and in accordance with the approved plan and this section. The report shall include discussion of any appearance of instability, structural weakness or other hazardous condition,

OPERATION PLAN

depth and elevation of any impounded waters, existing storage capacity, any existing or required monitoring procedures and instrumentation, and any other aspects of the structure affecting stability. A copy of the report shall be retained at or near the minesite.

A qualified registered professional land surveyor may inspect any temporary or permanent impoundment that does not meet the size or other criteria of 30 CFR Sec. 77.216(a) and certify and submit the report required above, except that all coal mine waste impounding structures shall be certified by a qualified registered professional engineer. The professional land surveyor shall be experienced in the construction of impoundments. Impoundments subject to 30 CFR Sec. 77.216 must be examined in accordance with 30 CFR Sec. 77.216-3. Other impoundments shall be examined at least quarterly by a qualified person designated by the operator for appearance of structural weakness and other hazardous conditions.

If any examination or inspection discloses that a potential hazard exists, the person who examined the impoundment shall promptly inform the Division of the finding and of the emergency procedures formulated for public protection and remedial action. If adequate procedures cannot be formulated or implemented, the Division shall be notified immediately. The Division shall then notify the appropriate agencies that other emergency procedures are required to protect the public.

A permanent impoundment of water may be created, if authorized by the Division in the approved permit based upon the following demonstration:

- 1.) The size and configuration of such impoundment will be adequate for its intended purposes.
- 2.) The quality of impounded water will be suitable on a permanent basis for its intended use and, after reclamation, will meet applicable State and Federal water quality standards, and discharges from the impoundment will meet applicable effluent limitations and will not degrade the quality of receiving water below applicable State and Federal water quality standards.
- 3.) The water level will be sufficiently stable and be capable of supporting the intended use.
- 4.) Final grading will provide for adequate safety and access for proposed water users.
- 5.) The impoundment will not result in the diminution of the quality and quantity of water utilized by adjacent or surrounding landowners for agricultural, industrial, recreational, or domestic uses.
- 6.) The impoundment will be suitable for the approved postmining land use.

The Division may authorize the construction of temporary impoundments as part of underground mining activities.

Ponds, impoundments, banks, dams, and embankments

Each application shall include a general plan for each proposed sedimentation pond, water impoundment, and coal processing waste bank, dam, or embankment within the proposed permit area. Each general plan shall:

- 1.) Be prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, a professional geologist, or in any State which authorizes land surveyors to prepare and certify such plans, a qualified, registered, professional land surveyor with assistance from experts in related fields such as landscape architecture;
- 2.) Contain a description, map, and cross section of the structure and its location;
- 3.) Contain preliminary hydrologic and geologic information required to assess the hydrologic impact of the structure;
- 4.) Contain a survey describing the potential effect on the structure from subsidence of the subsurface strata resulting from past underground mining operations if underground mining has occurred; and
- 5.) Contain a certification statement which includes a schedule setting forth the dates when any detailed design plans for structures that are not submitted with the general plan will be submitted to the Division. The Division shall have approved, in writing, the detailed design plan for a structure before construction of the structure begins.

Each detailed design plan for a structure that meets or exceeds the size or other criteria of the Mine Safety and Health Administration, 30 CFR Section 77.216(a) shall:

- 1.) Be prepared by, or under the direction of, and certified by a qualified registered professional engineer with assistance from experts in related fields such as geology, land surveying, and landscape architecture;
- 2.) Include any geotechnical investigation, design, and construction requirements for the structure;
- 3.) Describe the operation and maintenance requirements for each structure; and
- 4.) Describe the timetable and plans to remove each structure, if appropriate.

Each detailed design plan for a structure that does not meet the size or other criteria of 30 CFR Section 77.216(a) shall:

- 1.) Be prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, or in any State which authorizes land surveyors to prepare and certify such plans, a qualified, registered, professional land surveyor, except that all coal processing waste dams and embankments covered by Sections 817.81-817.84 of this Chapter shall be certified by a qualified, registered, professional engineer;
- 2.) Include any design and construction requirements for the structure, including any required geotechnical information;
- 3.) Describe the operation and maintenance requirements for each structure; and
- 4.) Describe the timetable and plans to remove each structure, if appropriate.

Sedimentation ponds, whether temporary or permanent, shall be designed in compliance with the requirements of Siltation Structures. Any sedimentation pond or earthen structure which will remain on the proposed permit area as a permanent water impoundment shall also be designed to comply with the requirements for Impoundments. Each plan shall, at a minimum, comply with the requirements of the Mine Safety and Health Administration, 30

OPERATION PLAN

CFR Sections 77.216-1 and 77.216-2.

Permanent and temporary impoundments shall be designed to comply with the requirements for Impoundments. Each plan for an impoundment meeting the size of other criteria of the Mine Safety and Health Administration shall comply with the requirements of 30 CFR Sec. 77.216-1 and 77.216-2. The plan required to be submitted to the District Manager of MSHA under Sec. 77.216 of this title shall be submitted to the Division as part of the permit application. For an impoundment not meeting the size of other criteria of 30 CFR Sec. 77.216(a) and located where failure would not be expected to cause loss of life or serious property damage, the Division may establish through the State program approval process engineering design standards that ensure stability comparable to a 1.3 minimum static safety factor in lieu of engineering tests to establish compliance with the minimum static safety factor of 1.3.

Coal processing waste banks, dams and embankments shall be designed to comply with the requirements for Coal Mine Waste. Each plan shall comply with the requirements of the Mine Safety and Health Administration, 30 CFR Sections 77.216-1 and 77.216-2, and shall contain the results of a geotechnical investigation of the proposed dam or embankment foundation area, to determine the structural competence of the foundation which will support the proposed dam or embankment structure and the impounded material. The geotechnical investigation shall be planned and supervised by an engineer or engineering geologist, according to the following:

- 1.) The number, location, and depth of the borings and test pits shall be determined using current prudent engineering practice for the size of the dam or embankment, quantity of material to be impounded, and subsurface conditions.
- 2.) The character of the overburden and bedrock, the proposed abutment sites, and any adverse geotechnical conditions which may affect the particular dam, embankment, or reservoir site shall be considered.
- 3.) All springs, seepage, and ground-water flow observed or anticipated during wet periods in the area of the proposed dam or embankment shall be identified on each plan.
- 4.) Consideration shall be given to the possibility of mudflows, rock-debris falls, or other landslides into the dam, embankment, or impounded material.

If the structure is 20 feet or higher or impounds more than 20 acre-feet, each plan of this section shall include a stability analysis of each structure. The stability analysis shall include, but not be limited to, strength parameters, pore pressures, and long-term seepage conditions. The plan shall also contain a description of each engineering design assumption and calculation with a discussion of each alternative considered in selecting the specific design parameters and construction methods.

Analysis:**General**

The plan contains the steps to be taken during coal mining and reclamation operations - through bond release - to minimize disturbance to the hydrologic balance within the permit and adjacent areas, to prevent material damage outside the permit area, to support approved postmining land use in accordance with the terms and conditions of the permit and the performance standards of R645-301-750, to comply with the Clean Water Act (33 U.S.C. 1251 et seq.), and to meet applicable federal and Utah water quality laws and regulations. The plan includes measures to be taken to avoid acid or toxic drainage, to prevent to the extent possible - by using the best technology currently available - additional contributions of suspended solids to streamflow, and to control drainage.

Ground-water and Surface-water Monitoring Plans

The Permittee plans to protect the ground-water system. The Permittee has identified that no ground-water system exists below the surface facilities. The facilities sits on top of the Mancos Shale, a formation that measures several hundred feet thick in shale that prevents the vertical and horizontal movement of water. All potential acid and toxic material will be disposed of in a confined stable area and covered with at least 4 feet of soil.

Contamination of aquifers above the coal seam is unlikely, because the aquifers are perched and exist in formations several hundred feet above the coal seam. The aquifers should not be intercepted by

mining activities.

The Permittee has based the ground-water and surface-water monitoring plans on the PHC determination and the analysis of baseline hydrologic, geologic, and other information in the **Permit Application proposed amendment**. Water samples from seeps, springs, and streams will be analyzed for the parameters listed in Tables 7-4 and 7-5. The parameters in Tables 7-4 (**B# 005374 to 005375**) and 7-5 (**B# 005376**) match the operational parameters in the Division's Directive Tech 004. Monitoring reports will be submitted to the Division at least every three months, within 30 days following the end of each quarter (Section 731.212, **B# 005365**). A permit condition will be that these data be submitted in an electronic format suitable for downloading directly into the Division's electronic water quality database.

The **proposed amendment Permit Application** includes a commitment to analyze ground- and surface-water samples for baseline parameters preceding each 5-year permit renewal (Section 731.200). These permit-renewal baseline analyses will be done for the surface-water samples collected at either high or low flow and for the spring samples collected at low flow during that year.

The Permittee's water-monitoring plan is intended to provide data to show impacts to potentially affected springs, seeps, impoundments and drainages within and adjacent to the permit area by comparison with relevant baseline data and with applicable effluent limitations (**B# 005370**). The Permittee has selected monitoring locations and frequencies, described in Table 7-3 (**B# 005372**), so that significant springs, seeps, impoundments and drainages that could potentially be impacted by the mining and reclamation operations will be monitored on a regular basis (Section 731.222.1, **B# 005369**).

Ground-water Monitoring

On December 14, 2001, the Board of Oil, Gas, and Mining remanded the Division's decision to issue the permit for the Lila Canyon extension partly because there "was no required monitoring for water quality other than seeps and springs for which there are inadequate baseline data." The PAP contains adequate baseline data and an operational water monitoring plan as is described below. Five of the 53 springs, three piezometers, the potential mine-discharge site, the sedimentation pond discharge, and three other surface monitoring sites were further selected for operational monitoring.

Operational

Nine sites are proposed for ground-water monitoring: L-5-G through L-10-G and IPA 1, 2, and 3. They are listed in Table 7-3 (**B# 005372**) and locations are shown on Plate 7-4 (**B# 005662**). Seeps and springs will be monitored quarterly for parameters listed in Table 7-5 (**B# 005376**). Station L-5-G is the potential mine discharge point and will be monitored in accordance with UPDES Permit requirements. **Piezometers** IPA 1, 2, and 3 will be monitored quarterly for depth.

Springs L-6-G through L-10-G were selected for monitoring. They are located over or adjacent to the area of proposed mining. These springs correlate to some of the same seeps and springs monitored previously by JBR Consultants, while working for Kaiser Steel Corporation. They also correlate with springs monitored by EarthFax Engineering, who conducted monitoring for IPA. The

OPERATION PLAN

springs are shown in Table 7-3 (B# 005372).

Four of the springs proposed for operational monitoring are identified by the Permittee as L-7-G, L-8-G, L-9-G (Pine Spring), and L-10-G (William's Draw spring) and correspond with the springs monitored by EarthFax as 9, 10, 16(Z), and 14, respectively. Other springs may be included as deemed necessary. Appendices 7-1 (B# 005426 to 005562) and 7-6 (B# 005807 to 005998) of the Lila Canyon Permit Application ~~Significant Revision~~ contain data on Springs 9, 10, 14, and 16(Z) from 1993, 1994, and 1995, when they were monitored for baseline for the South Lease by IPA.

L-6-G is in the vicinity of Mont Spring, water right 91-617, and Leslie Spring, water right 91-618. These water rights correspond closely to JBR sample sites H-21 and H-19 and are near H-20, H-21A, H-21B, and H-22; H-18 has been selected by the Permittee as L-6-G to monitor ground water in this area because it is the lowest spring in the stratigraphic sequence (B# 005365).

The spring to be monitored by the Permittee at L-7-G was monitored as 9 (S-9) from 1993 to 1995. Spring 9 is near springs 8, 19-A, and 19-B and has had the most consistent flow of the group. Baseline data for Spring 9 are in Appendices 7-1 and 7-6. The Permittee identifies Spring 9 as Cottonwood Spring (B# 005365), which is associated with water right 91-2521 in Table 7-2 (B# 005355 to 005357); however, the location described for water right 91-2521 in Table 7-2 (NE/4 Sec. 13, T. 16 S., R. 14 E.) is probably very general (as are many descriptions of water-right locations): that NE quarter-section is on a topographic high and there are no identified springs at that location. Water rights 91-399 and 91-2537 are closer to springs 8, 9, 19-A, and 19-B.

A water-monitoring program was implemented in July 2000 to determine if the springs proposed for operational monitoring were still viable and to establish a current baseline that would be continuous with operational monitoring (Chapter 7, B# 005363): L-6-G (H-18, HC-18, EWL-25), L-7-G (9, S-9), L-8-G (10, S10), L-9-G (16, 16Z, S-16), and L-10-G (14, S14) were monitored in July and November 2000 and February, June, and July 2001, but there was no flow or no access reported for all sites: reports are in Appendix 7-1 of the Permit Application (B# 005558 to 005562) ~~proposed amendment. May 2001, L-10-G, was flowing approximately 1 gpm; no water-quality samples were taken.~~ Because of confusion in identifying the spring sites in July 2000, UEI has marked the July 2000 spring data as "not sampled" (letter dated June 26, 2001 and final version of Appendix 7-1; B# 00121, 005558 to 005562).

Baseline water levels for IPA-1, IPA-2, and IPA-3 were established in 1994, 1995, and 1996 (B# 005551). ~~have been established at three points: IPA 1, IPA 2, and IPA 3.~~ The MRP contains a commitment to monitor these three ~~wells piezometers~~ quarterly (B# 005365) ~~for water levels.~~ In December 2000, UEI was able to measure the water level in IPA-2, but at IPA-1 and IPA-3 the probe was not able to go far enough ~~into the wells~~ to reach water. Water monitoring reports indicate the ~~wells piezometers~~ were not accessible in February 2001. All three ~~wells piezometers~~ were successfully measured by EIS on May 15, 2001. The information is reported in Appendix 7-1.

~~MapPlate~~ 7-1 (B# 005659), based on data garnered from several sources, shows potential ground-water levels and where the Permittee anticipates the mine workings will intercept ground water. The

⁴Field visit on May 15, 2001 of Jim Smith and Dave Darby of UDOGM and Tom Paluso of Environmental Industrial Services.

OPERATION PLAN

amount of ground water that will actually enter the mine workings depends on the storage capacity of the surrounding formation, the permeability, and type of structure at the mining face. If mine water interception occurs, the water will be stored in sumps and used in the mine and, if necessary, discharged from the mine. Eventually, the three IPA- ~~piezometers wells~~ may be intercepted by the mine, so in addition to the three ~~wells piezometers~~, the Permittee commits in Section 731.513 (B# 005381) to the monitoring of underground usage and discharge to more accurately define potential impacts on ground water.

Ground-water will be monitored and data will be submitted at least every three months for each monitoring location. Monitoring submittals will include analytical results from each sample taken during the approved reporting period. When the analysis of any ground-water sample indicates noncompliance with the permit conditions, then the operator will promptly notify the Division and immediately take the actions provided for in 145 and 731 (Section) 731.212). Ground-water monitoring will continue through mining and reclamation until bond release (Section 731.214).

Equipment, structures and other devices used in conjunction with monitoring the quality of ground water on-site and off-site will be properly installed, maintained and operated and will be removed by the operator and when no longer needed (Section 731.215).

Surface-water Monitoring

~~Streams will be monitored monthly, S~~sediment pond and mine discharges will be monitored monthly or as frequently as discharges occur (Table 7-3, B# 005372). ~~No monitoring is proposed for Little Park Wash. During 1999 and 2000, Little Park Wash was observed numerous times by the Permittee, at least quarterly, and no flow was noted (B# 005348).~~

~~Perennial and intermittent headwater reaches in some drainages are fed by flow from perched aquifers through baseflow and spring flow. Except for these perennial and intermittent headwater reaches, D~~drainages in the area flow in response to snowmelt and precipitation events. ~~This includes drainages that are considered intermittent under the Coal Mining Rules because they drain an area greater than one square mile.~~ The proposed surface-water monitoring program will monitor the Lila Canyon drainage both above and below the disturbed mine site area at L-1-S, L-2-S, and L-3-S and the sediment pond discharge at L-4-S.

UEI's water-monitoring program was initiated in July 2000. This information combined with the other pre-mining data collected on the proposed permit area by JBR Consulting and EarthFax Engineering establish the baseline information required to characterize the premining hydrologic system. The surface- and ground-water monitoring sites will be monitored quarterly during and after the operational period to establish any diminution or damage to the system.

L-1-S, L-2-S, L-3-S, and L-4-S were monitored in July and November 2000 and February, ~~June and July~~ 2001. Data sheets show "no flow" for July 2000 for some sites and "no access" for November and February 2000 for all four sites. Reports are in Appendix 7-1 of the ~~proposed-revision~~ Permit Application (B# 005553 to 005556).

OPERATION PLAN

Point-source discharge monitoring will be conducted in accordance with 40 CFR Parts 122 and 123, R645-301-751 and as required by the Utah Division of Water Quality (UDWQ) for UPDES permits. A UPDES discharge permit application has been submitted for the proposed sediment pond and mine water discharge for the Lila Canyon operation (B# 005370). Copies of the UPDES permit applications for the Lila Canyon Mine are provided in Appendix 7-5 (B# 005797 to 005806).

The Permittee has outlined some standards by which surface-water quality will be protected. Water quality and quantity can be preserved by handling earth materials, ground-water discharges and runoff in a manner that minimizes the formation of acid or toxic drainage; prevents, to the extent possible using the best technology currently available, additional contributions of suspended solids to streamflow outside the permit area; and otherwise prevents water pollution.

Surface-water quality protection is proposed to be accomplished by the plan described in Section 731 and the following methods:

- (1) Proper handling of earth materials to minimize acidic, toxic or other harmful infiltration to ground-water systems, and minimizing surface disturbance;
- (2) Testing to ensure stockpiled materials are non-acid and non-toxic;
- (3) Controlling and treating disturbed area runoff to prevent discharge of pollutants into surface-water by the use of diversions, culverts, silt fences, sediment ponds, and by chemical treatment if necessary;
- (4) Minimizing and/or treating mine water discharge to comply with UPDES discharge standards;
- (5) Establishing where surface-water resources exist within or adjacent to the permit area through a baseline study (done) and monitoring quality and quantity of significant sources through implementation of a water monitoring plan (proposed);
- (6) Proper handling of potentially harmful materials (such as fuels, grease, oil, etc.) in accordance with an approved Spill Prevention Control and Countermeasure Plan (SPCC).

Locations of all monitoring sites are shown on Plate 7-4 , "Water Monitoring Location Map". Proposed monitoring methods, parameters and frequencies are described in Table 7-3, "Water Monitoring Stations," and Table 7-4, "Water Monitoring Parameters." Monitoring reports will be submitted to the Division at least every 3 months, within 30 days following the end of each quarter. The operational water monitoring plan will be implemented upon approval of the MRP.

The proposed surface-water monitoring plan is detailed in Section 731.220. This plan is based on PHC determination and analysis of all baseline hydrologic, geologic and other information in this permit application. The plan provides for monitoring of parameters that relate to the suitability of the surface water for current and approved postmining land uses and to the objectives for protection of the hydrologic

balance as set forth in R645-301- 751 (see Table 7-4).

The BLM originally proposed that the Permittee, UEI, develop a water monitoring plan for Range Creek, a perennial stream several miles northwest of the mine, to assess any potential impacts from mining to the perennial stream. The BLM later determined that Range Creek was separated from the mine by several miles that impacts from mining activities were unlikely, and that it did not have to be monitored for impacts. The Division concurs with the BLM. No monitoring plan has been proposed by the operator for Range Creek.

Kerry Flood, Hydrologist for the Bureau of Land Management, originally proposed that the Permittee develop a water monitoring plan for Range Creek, a perennial stream several miles north-west of the mine to assess any potential impacts from mining. No monitoring plan has been proposed by the Permittee for Range Creek. It was later determined by the BLM that because Range Creek was separated from the mine by several miles and no influence from mining activities were likely, that it did not have to be monitored.

The Division evaluated the potential for impact to Range Creek and has determined that mining will not impact Range Creek in any way. Aquifers in the Colton and undifferentiated North Horn Formation-Flagstaff Limestone will not be impacted because of the aquitard, the amount of overlying strata and sealing capacity of the formations which will prevent interception. Also, the impermeability of the undifferentiated North Horn Formation-Flagstaff Limestone aquitard and low conductivity clays in the Mesa Verde Group will also prevent vertical movement from the deep zone toward Range Creek. Not to mention the great distance groundwater would have to travel, through very low permeability rock, to reach Range Creek as shown by Osterwald, 1981 (B# 006469, Geological Survey Professional Paper 1166, Plate 1; see references to SUWA, 9/20/01). (Fig. 1)

Discharges of water from this operation will be made in compliance with all Utah and federal water quality laws and regulations and with effluent limitations for coal mining promulgated by the Environmental Protection Agency (EPA) set forth in 40 CFR Part 434 (see Sections 731 and 742).

Monitoring reports will be submitted to the Division at least every 3 months, within 30 days following the end of each quarter (Section 731.220). Surface-water monitoring will continue through mining and reclamation until bond release (Section).

Equipment, structures and other devices used in conjunction with monitoring the quality and quantity of surface water on-site and off-site will be properly installed, maintained and operated and will be removed by the operator when no longer needed (Section 731.225).

Acid and Toxic-forming Materials

Drainage from acid- and toxic-forming materials and underground development waste into surface water and ground water will be avoided by implementation of a SPCC Plan and by the following:

OPERATION PLAN

No acid or toxic discharges should occur. The potential for acid mine drainage was evaluated. There is a good potential that mine water will be discharged based on piezometer levels, however the Permittee has committed that all discharges will be made in compliance with all Utah and federal water quality laws and regulations and with effluent limitations for coal mining promulgated by the U.S. Environmental Protection Agency set forth in 40 CFR Part 434. Groundwater intercepted in the mine will be stored in sumps and treated prior to any discharges (B# 005381).

The Permittee has obtained an UPDES permit for mine water discharge in the event discharges are necessary. Water quality information collected from the Horse Canyon Mine by Waddell, 1982 and by the Permittee indicate good water quality with above normal buffering capabilities for any acidic solutions produced. In the event that all fail-safe measures are overcome and any acidic water is discharged, it would be into a channel lined with buffering constituents of the Mancos Shale. The receiving stream is partially classified as intermittent, but acts as ephemeral by nature. The nearest perennial stream downstream of the proposed permit extension, the Price River, is 58,000 feet (11 miles) downstream. A discharge of 500 gpm would not reach the Price River, and no impacts would occur.

Potentially acid- or toxic-forming materials will be identified by use of Material Safety Data Sheets (MSDS), or by direct sampling and analysis in the case of underground development waste.

Any material which exhibits acid- or toxic-forming characteristics will be properly stored, protected from runoff, removed to an approved disposal site or buried on site beneath a minimum of 4' of non-acid, non-toxic material.

Storage of potentially acid- or toxic-forming materials, such as fuel, oils, solvents and non-coal waste will be in a controlled manner, designed to contain spillage and prevent runoff to surface or ground-water resources.

All oils and solvents will be stored in proper containers within enclosed structures. Fuels will be stored in appropriate tanks, enclosed within concrete or earthen bermed areas designed to contain any spillage.

Noncoal waste (garbage) will be stored in a designated location, in dumpsters, and removed to an approved landfill (ECDC) on a regular, as-needed basis.

Unused or obsolete equipment or supplies will be stored in a designated area. Drainage from the storage area will be directed to the sediment pond as shown on the Sediment Control Map, Plate 7-5.

Underground development waste (if any) will also be stored in a designated area. Such waste will be tested for acid- or toxic-forming potential, and if found to be acid- or toxic-forming, the waste site will be protected from surface runoff by the use of earthen berms.

Transfer of Wells

There are presently three monitoring wells in the proposed addition to the permit area. When these wells are no longer required, they will be sealed in a safe, environmentally sound manner in accordance

with regulations .

Discharges Into an Underground Mine

There are no plans to discharge any water into an underground mine.

Gravity discharges from underground mines.

The proposed access portals are below the coal outcrop, as shown on Plates 5-2 and 7-5. The fan is to be located above the outcrop. The two 1,227-foot access tunnels will slope up at approximately 12 percent, from a starting elevation at the surface of approximately 6,150 feet. The intersection of the coal seam and the rock slope will take place at approximately 6,300 feet elevation. Maximum ground-water elevation measured in the three IPA piezometers wells was 5,972 feet, and maximum projected elevation in the vicinity of the rock-slope tunnels is approximately 6,000 feet (Plate 7-1), so it is unlikely the rock slopes will intercept ground water in the deep saturation zone regional aquifer.

Based on historical data from other mines in the area, some mine water can be expected to be encountered during the mining operation. Typically, such water is stored in "sumps" or designated areas in the mine and used for mining operations or discharged to the surface.

Presently, the Permittee plans to use the water that is intercepted during mining operations. The Permittee has submitted an application to the UDWQ for a UPDES mine water discharge permit in the event water production is greater than can be used in the mine. The Permittee has identified the mine water discharge and monitoring site as L-5-G. The Permittee has stated that receiving channels will be studied before and during discharge to analyze any changes or adverse impacts from mine water discharge.

Numbers provided in the Lila Canyon- Permit Application Significant Revision (Figure 7-1) indicate ground-water levels would need to rise approximately 150 feet just to reach the starting elevation of the tunnels at the base of the Book Cliffs (6,150 feet) and approximately 300 feet to reach the intersection of the tunnels with the coal seam (6,300 feet). Mining will proceed down dip, to the east, from that intersection. Based on water monitoring results and historical information, it is unlikely water levels will ever reach the intersection of the tunnel and coal seam. Gravity discharge from the surface entries of the mine is also unlikely.

The Permittee has identified how any excess mine water production will be transported from the mine via a pipe to the Lila Canyon channel. If mine water is discharged the Permittee will submit plans to protect the discharge site and include that site in the disturbed area.

Water Quality Standards and Effluent Limitations

The surface-water monitoring point-source discharge will be conducted in accordance with 40 CFR Parts 122 and 123, R645-301-751 and as required by the UDWQ for UPDES permits. A UPDES discharge permit application has been submitted to the UDWQ for the proposed sediment pond and mine water for the Lila Canyon operation. UPDES permit applications for the Lila Canyon Mine are provided

OPERATION PLAN

in Appendix 7-5. Parameters are shown in Table 7-4. Water monitoring locations and sample frequencies are described in Table 7-3 and on Plate 7-4 .

As indicated in Section 731.220, surface-water monitoring data will be submitted to the Division at least every three months. Discharge monitoring reports will be submitted to UDWQ monthly. When analysis of any surface-water sample indicates non-compliance with the permit conditions, the Permittee will promptly notify the Division and immediately take action to identify the source of the problem, correct the problem and, if necessary, to provide warning to any person whose health and safety is in imminent danger due to the non-compliance.

Any discharge from the sediment pond will be made in compliance with all Utah and federal water quality laws and regulations and with effluent limitations for coal mining promulgated by the Environmental Protection Agency set forth in 40 CFR Part 434.

Casing and Sealing of Wells

Three ground-water monitoring wells are identified on the site. There are no plans for other water wells on this site; however, the application states if any wells are installed in the future, requirements of this section will be met. The Permittee has submitted plans to seal all wells in Section 765.

Diversions

The Permittee plans to install two culvert sections, UC-1 and UC-2, in the south fork of Coleman Wash which runs along the south side of the proposed mine pad. Culvert UC-2 will run underneath the sediment pond and the county road. UC-1 will be installed upstream to protect the embankment and the truck turnaround road (Plates 5-2 and 7-2). Both culverts will allow undisturbed runoff to bypass the site without mixing with disturbed area runoff. The Permittee will replace the existing 36-inch culvert under the road with a 60-inch corrugated metal pipe (UC-2, Plate 7-6). UC-1 is also a 60-inch culvert. Calculations⁵ show both 60-inch culverts to be oversized, and they will easily transmit the design-storm flow from a 100-year, 6-hour precipitation event, required by the regulations.

Calculations indicate that the 100-year, 6-hour precipitation event would produce a flow of about 51.6 cubic feet per second (cfs) down the channel. A 60-inch culvert with a headwall of one depth in diameter, $H/D=1$, will pass a flow of about 95 cfs. A 36-inch diameter culvert could have been used to pass the calculated runoff; however, late summer thunderstorms wash sediment and debris down the channels, and the larger 60-inch culvert was recommended by Utah Division of Water Rights, Stream Alteration Permit Program and the Division to ensure extra safety. The larger culvert should pass debris and extra large flows to protect the culvert and sedimentation pond built above the culvert.

The Permittee has submitted plans for culvert inlet and outlet protection in Figures 4 and 4a of Appendix 7-4. A trash rack will be used to help prevent clogging of UC-2. Riprap will be used to protect

⁵Calculations for peak flow discharge was provided by UEI's consultant using Storm, a computer program using the Soil Conservation Service's (now NRCS) curve number (CN) method. The CN method and culvert sizing methods are described in the National Engineering Handbook, as well as many other sources.

the embankments. The Permittee based the riprap sizing on calculations in Figure 7-26 in "Design of Outlet Protection Maximum Tailwater Condition" and "Applied Hydrology and Sedimentology for Disturbed Areas," Barfield, Warner and Haan, 1983. Based on the calculations, the apron has a 0-degree slope, designed to be 20 feet long and widening from 5 feet to 9 feet. Riprap is conservative with a D-50 of 12 inches. It will be placed to a depth of 1.5 feet, and the base layer will consist of an embedded 6-inch layer of drain rock filter. Riprap will also be placed on a 2h:1v side slope to the height of the culvert at the culvert outlet tapering to 2 feet at the outlet of the apron.

Other diversions planned for the disturbed area are shown on Plate 7-5. Design details for all diversions are provided in Appendix 7-4. The Permittee indicates that all diversions will be constructed and maintained to comply with the requirements of R645-301-742.100 and R645-301-742.300.

The requirements for obtaining a Stream Alteration Permit for ephemeral drainages⁶ is: stream channels which contain riparian vegetation and a relatively frequency of flow. The channel where culverts UC-1 and UC-2 will be placed does not meet those requirements. The channel is classified as ephemeral and vegetation ranges between xeric and mesic, consisting of single leaf ash and rabbitbrush. Regulations require that disturbed area markers be placed along the boundaries of the disturbed area, so no unplanned disturbance should take place.

Stream Buffer Zones

It is the determination of the Division, based on the following information, that water quality and quantity will not be diminished, and that subsidence will not impact the intermittent stream channels. Therefore, the applicant may conduct mining operations within 100 feet of the channels of Little Park Wash and Lila Canyon Wash (North Fork of Coleman Wash).

The Permittee has committed to identifying buffer zones adjacent to Lila Canyon Wash and the South Fork of Coleman Wash to prevent damage to the channels. Monitoring sites have been established, L-1-G, L-2-G, L-3-G, and L-4-G (sedimentation pond) and L-5-G (mine water discharge) to characterize any water discharges, as practical (B# 005363).

The potential for acid mine drainage was evaluated. There is a good potential that mine water will be discharged based on piezometer levels, however the Permittee has committed that all discharges will be made in compliance with all Utah and federal water quality laws and regulations and with effluent limitations for coal mining promulgated by the U.S. Environmental Protection Agency set forth in 40 CFR Part 434. Groundwater intercepted in the mine will be stored in sumps and treated prior to any discharges (B# 005381).

The Permittee has obtained an UPDES permit for mine water discharge in the event discharges are necessary. Water quality information collected from the Horse Canyon Mine by Waddell, 1982 and by the Permittee indicate good water quality with above normal buffering capabilities for any acidic solutions

⁶Telephone conversation between Dave Darby, DOGM, and Jim Wells, Utah Division of Water Rights on November 17, 2000,

OPERATION PLAN

produced. In the event that all fail-safe measures are overcome and any acidic water is discharged, it would be into a channel lined with buffering constituents of the Mancos Shale. The receiving stream is partially classified as intermittent, but acts as ephemeral by nature. The nearest perennial stream downstream of the proposed permit extension, the Price River, is 58,000 feet (11 miles) downstream. A hypothetical discharge of 500 gpm would not reach the Price River, and no impacts would occur.

The potential for water quality impacts is not likely in any of the channels. No disturbance will take place adjacent to Little Park Wash. Although flows have not been sampled, several USGS reports show that high volumes of runoff from adjacent areas contain large amounts of suspended and dissolved sediments. The Permittee has provided information in the MRP to show that runoff from the disturbed area and any potential mine discharges will meet water quality standards (as discussed in other sections).

Before discharges, geomorphology of the stream channel will be assessed and any damage mitigated (pp. 25-26, Chapter 7; B# 005359 to 005360).

The Lila Canyon channel and Little Park Wash are classified as intermittent stream channels, since they are over a square mile in area, but function as ephemeral channels. The south fork of Coleman Wash south of the disturbed area is smaller, often dry and is less than a square mile. It also functions as an ephemeral stream. There will be mine development within 100 feet of the Lila Canyon channel and mining beneath Little Park Wash.

The Permittee has provided a subsidence control plan which identifies that the amount of rock strata between the coal seam and the stream channel is sufficient to protect the channel from subsidence impacts and identifies that no interception of flows or diminution of property will occur. Permittee presented sufficient information to establish that a sufficient ratio of overlying rock to mine thickness will provide a sufficient buffer from subsidence. Considering the interbedded shales within the Blackhawk Formation at this site and mine techniques, it is unlikely that Little Park Wash will be affected by mining.

The Division finds the intermittent stream channels will not be affected by mining; that mining within 100 feet of Lila Canyon channel and Little Park Wash will not cause or contribute to the violation of applicable State or Federal water quality standards and will not adversely affect the water quality or quantity or other environmental resources of the streams.

The types of impacts from mining that could affect Little Park Wash and Lila Canyon Wash could be water quality degradation. Only Little Park Wash has the potential of being affected by subsidence. Lila Canyon Wash has already been mined under by the Horse Canyon Mine (Plate 5-1, MRP B# 005138). Subsidence can be allowed within 100 feet of an intermittent stream if renewable resource lands are not impacted (see Surface Water in Resource Description Section).

Sediment Control Measures

Sediment control measures within and adjacent to the disturbed areas are detailed in Appendix 7-4. These measures include a collection system of ditches and culverts which transport runoff and sediment to a sedimentation pond. Silt fences and a berm will also be used to control sediment and runoff from small areas.

The Permittee submitted plans in Appendix 7-4 to construct a berm below the fan portal which will capture and contain the runoff and sediment on site. The fan portal area is small consisting of an area of 0.716 acres. The volume of runoff from a 10-year, 24-hour precipitation event is 0.06 acre-feet. The berm will be 2 feet high and have 2h:1v embankments. The berm should contain the runoff and sediment volume generated from the design storm.

As described in Appendix 7-4, runoff from the disturbed area will be routed via ditches and culverts and captured in a sedimentation pond and/or treated as necessary to meet effluent limitations prior to discharge. Calculations have been submitted for all culverts and ditches which show they are sized to transport the runoff from a 10-year, 24-hour precipitation event.

The primary means of velocity reduction is riprap; however, other methods, such as straw dikes, check dams, and/or vegetative filters, may be employed during the operational or reclamation phases as determined necessary, and with Division approval.

Siltation Structures

As described in Appendix 7-4, siltation structures planned for this operation are a sediment pond and possible minor, temporary sediment traps, such as straw dikes and/or catch basins.

Siltation structures will be designed, constructed and maintained in accordance with regulations.

The Permittee has stated that all siltation structures are temporary and will be removed when not needed. The sedimentation pond will remain for a minimum of two years during the mines' reclamation phase after the disturbed area is regraded to Approximate Original Contours (AOC) to capture and contain sediment. The sedimentation pond will be removed at the end of Phase II Bond Release. Some silt fences may be used to control and contain sediment during Phase II and Phase III, but will be removed before final bond release.

Sedimentation Ponds

The general drainage plan for the disturbed area is to divert surface flows using a system of ditches and culverts which direct flows to a single sedimentation pond for treatment. Sedimentation pond locations, design plans and cross sections are provided on Plates 7-2, 7-5 and 7-6, respectively.

The sediment control plan and proposed sediment pond designs have been prepared and certified by a registered professional engineer.

The pond is designed to contain the runoff from a 10 year - 24 hour precipitation event for the area in addition to a minimum of 2 years of sediment storage. See sediment pond construction specifications in Appendix 7-4 and Plate 7-6. The required volume of the sedimentation pond is calculated at 8.4 acre-feet, which also includes the undisturbed areas UA-2, UA-3, UA-4 and UA-6, and 3 years of sediment storage volume. The volume established for the undisturbed areas was included by UEI in the event any of these areas will be developed in the future. The sedimentation pond size will contain a volume of approximately 8.54 acre-feet, a volume greater than required. Any discharge from the pond will be in

OPERATION PLAN

accordance with the approved UPDES permit.

The proposed sedimentation pond is located where failure would not cause loss of life or serious property damage. As shown in Appendix 7-4, the inslope will not be steeper than 3h:1v, and the outslope will not be steeper than 2h:1v. These slopes, along with the 95 percent compaction requirement, will ensure a static safety factor in excess of 1.3, as required by R645-301-533.100.

If the sedimentation pond becomes full and is decanted, or it discharges, the treated runoff will discharge into culvert UC-2, which carries it to the south fork of Colman Wash off the permit area. Site drainage and design details are described in Appendix 7-4 and illustrated on Plate 7-6.

All discharges from the sedimentation pond, diversions, and culverts will be controlled to prevent channel erosion by the use of riprap aprons where discharge velocities exceed 5 feet per second. Figure 4A in Appendix 7-4 shows a typical apron protection structure for UC-2.

Other Treatment Facilities

No other treatment facilities as defined in R645-100-200 are planned for this operation.

Exemptions for Siltation Structures

No exemptions were requested by the Permittee.

Discharge Structures

The principle spillway consists of a 24 inch corrugated metal pipe culvert, which opens to the undisturbed channel culvert (UC-2). It contains a valved decant at the 5834 feet elevation. The emergency spillway will be constructed of a 24 inch corrugated metal stand pipe installed next to the principle spillway. Both spillways will have a 48 inch oil skimmer. Plate 7-6 shows a detailed view of the spillways. The cross-section on plate 7-6 shows a catwalk to access the spillways for sampling and decanting.

The emergency spillway discharges into the 60 inch undisturbed culvert, UC-2, and will be used in combination with the principal spillway to pass the flow of a 25-year, 6-hour precipitation event, (See Appendix 7-4). The corrugated metal pipe emergency spillway has a potential to increase flows over the discharge apron from UC-2. Calculations for riprap protection in Appendix 7-4 is designed to handle the combined flows, 25 year-6 hour flows, discharging from both the sedimentation pond and from the same event flows coming down the undisturbed channel, UC-2.

Diversions and culvert outlets which are expected to have flow velocities in excess of 5 fps will be equipped with erosion and velocity controls as described in Appendix 7-4.

Impoundments

The Permittee proposes to construct only one sedimentation pond that will be in the southeast

OPERATION PLAN

corner of the disturbed area (See Plate 5-2). The sedimentation pond will have a maximum storage capacity of 12 acre-feet and a height of 11 feet. Therefore, the pond does not meet the criteria for an MSHA pond. The sedimentation pond design was certified by a registered professional engineer.

In Appendix 5-5, the Permittee shows the results of the static safety factor analysis. The lowest safety factor of the embankments is 2.35 for the slopes under saturated conditions, which exceeds the 1.3 requirement. The Permittee did include the analysis of the physical and engineering properties of the foundation materials.

The Permittee states in Appendix 5-5 that the pond is protected against sudden drawdown. The analysis shows that the pond will be safe under sudden drawdown conditions. The safety factor calculated in the analysis is 2.02. A safety factor of 1.0 is considered safe under rapid drawdown conditions; therefore, the Permittee meets the regulatory requirements.

The sedimentation pond design was approved by the Division of Water Rights. The Division has a copy of the approval letter.

A freeboard is planned to resist overtopping by waves and by sudden increases in storage volume. The elevation of the emergency spillway is 5841 feet while the top of the embankment will be 5843 feet, with a freeboard of 2 feet and a volume of 2.36 ac-ft.

The outslopes of the sedimentation pond will be planted with an approved seed mix to help prevent erosion and promote stability. No highwalls are associated with the impoundment. The Permittee committed to conduct inspections required.

The application discusses treatment facilities around the fan portal. The small disturbed area will be treated using silt fences and a berm to control and contain the expected runoff of 0.06 acre-feet for the 10-year, 24-hour design precipitation event.

The sediment pond will be inspected according to the requirements of R645-301-514. The designs will be certified by a professional engineer according to the requirements of R645-301-512.

Casing and Sealing of Wells

There are three water monitoring wells in the Lila Canyon Lease Tract and one water supply well near the Horse Canyon Mine. There are no additional wells planned for the Lila Canyon Mine. All wells will be sealed in accordance with R645-301-765 of the Coal Mining Rules (Section 765).

Findings:

The Permittee has met the minimum operations hydrologic information requirements.

SUPPORT FACILITIES AND UTILITY INSTALLATIONS

OPERATION PLAN

Regulatory Reference: 30 CFR Sec. 784.30, 817.180, 817.181; R645-301-526.

Minimum Regulatory Requirements:

Each applicant for an underground coal mining and reclamation permit shall submit a description, plans, and drawings for each support facility to be constructed, used, or maintained within the proposed permit area. The plans and drawings shall include a map, appropriate cross sections, design drawings, and specifications sufficient to demonstrate compliance.

Support facilities shall be operated in accordance with a permit issued for the mine or coal preparation plant to which it is incident or from which its operation results. In addition to the other provisions of this part, support facilities shall be located, maintained, and used in a manner that: prevents or controls erosion and siltation, water pollution, and damage to public or private property; and, to the extent possible using the best technology currently available, minimizes damage to fish, wildlife, and related environmental values and minimizes additional contributions of suspended solids to streamflow or runoff outside the permit area. Any such contributions shall not be in excess of limitations of State or Federal law.

All surface and underground mining activities shall be conducted in a manner which minimizes damage, destruction, or disruption of services provided by oil, gas, and water wells; oil, gas, and coal-slurry pipelines, railroads; electric and telephone lines; and water and sewage lines which pass over, under, or through the permit area, unless otherwise approved by the owner of those facilities and the Division.

Support facilities shall be operated in accordance with a permit issued for the mine or coal preparation plant to which it is incident or from which its operation results. In addition to the other provisions of this part, support facilities shall be located, maintained, and used in a manner that prevents or controls erosion and siltation, water pollution, and damage to public or private property. Support facilities shall, to the extent possible using the best technology currently available, minimizes damage to fish, wildlife, and related environmental values; and, minimizes additional contributions of suspended solids to streamflow or runoff outside the permit area. Any such contributions shall not be in excess of limitations of State or Federal law.

Analysis:

The new support facilities are described in Section 520 of the application, shown on Plate 5-2 and in the appendices in Chapter 5 of the application. Appendix 5-4, New Facility Design, shows design for roads and the sewage system. Appendix 5-7 has designs for the refuse pile. The new structures and facilities listed in Section 520 are as follows:

- Mine Facilities Road
- Security Shack
- Mine Substation
- Office/Bathhouse/Warehouse Parking Area
- Office/Bathhouse
- Mine Parking
- Shop Warehouse
- Non-Coal Waste Area
- Equipment & Supplies Storage Area
- Sewer Tank & Drain Field
- Water Treatment Plant
- Potable Water Tank
- Process Water Tank
- Topsoil Pile
- Refuse Pile
- Sedimentation Pond
- Slope Access Road
- Rock Slopes
- Ventilation Fan
- ROM Underground Belt
- ROM Storage Pile

Crusher
Coal Storage Bin
Truck Scale and Loadout

The Permittee is required to construct and maintain support facilities to:

- Control or prevent erosion, siltation, water pollution and damage to public or private property.
- Minimize damage to fish, wildlife, and related environmental issues such as minimizing additional contributions of suspended solids to streamflows.
- Minimize damage to oil, gas and water wells; oil, gas and coal-slurry pipelines, railroads and other utilities.

All support facilities will be located within the disturbed area. Runoff from the disturbed area will report to the sedimentation pond for treatment before being discharged. For additional details on erosion, siltation and water pollution see the Hydrology section of this TA. Fish and wildlife issues are discussed in detail in the Fish and Wildlife Protection Plan section of this TA.

Findings:

The Permittee has met the minimum support facilities and utility installation requirements of the regulations.

SIGNS AND MARKERS

Regulatory Reference: 30 CFR Sec. 817.11; R645-301-521.

Minimum Regulatory Requirements:

Signs and markers shall: be posted, maintained, and removed by the person who conducts the underground mining activities; be of a uniform design throughout the activities that can be easily seen and read; be made of durable material; and, conform to local laws and regulations. Signs and markers shall be maintained during all activities to which they pertain.

Mine and permit identification signs shall be displayed at each point of access from public roads to areas of surface operations and facilities on permit areas for underground mining activities. Signs will show the name, business address, and telephone number of the person who conducts underground mining activities and the identification number of the current regulatory program permit authorizing underground mining activities. Signs shall be retained and maintained until after the release of all bonds for the permit area.

Perimeter markers shall clearly mark the perimeter of all areas affected by surface operations or facilities before beginning mining activities.

Buffer zones shall be clearly marked to prevent disturbance by surface operations and facilities.

Topsoil markers shall be used where topsoil or other vegetation-supporting material is segregated and stockpiled.

OPERATION PLAN

Analysis:

The Permittee committed to place signs and markers as required by the Utah Coal Rules which require placement of signs and markers for underground coal mines as follows:

- Be posted, maintained, and removed by the person who conducts the coal mining and reclamation operations.
- Be a uniform design that can be easily seen and read; be made of durable material; and conform to local laws and regulations.
- Be maintained during all activities to which they pertain.
- Identification signs will be displayed at each point of access from public roads to areas of surface operations and facilities on permit areas.
- Show the name, business address, and telephone number of the Permittee who conducts coal mining and reclamation operations and the identification number of the permanent program permit authorizing coal mining and reclamation operations.
- Be maintained until after the release of all bonds for the permit area.
- The perimeter of all areas affected by surface operations or facilities before beginning mining activities will be clearly marked.
- Signs will be erected to mark buffer zones as required under R645-301-731.600 and will be clearly marked to prevent disturbance by surface operations and facilities.
- Topsoil markers will be erected to mark where topsoil or other vegetation-supporting material is physically segregated and stockpiled as required under R645-301-234.

Findings:

The Permittee has met the minimum requirements of the signs and markers section of the regulations.

USE OF EXPLOSIVES

Regulatory Reference: 30 CFR Sec. 817.61, 817.62, 817.64, 817.66, 817.67, 817.68; R645-301-524.

Minimum Regulatory Requirements:**General Requirements**

These requirements apply to surface blasting activities incident to underground coal mining, including, but not limited to, initial rounds of slopes and shafts. Each operator shall comply with all applicable State and Federal laws and regulations in the use of explosives.

All surface blasting operations incident to underground mining shall be conducted under the direction of a certified blaster. Certificates of blaster certification shall be carried by blasters or shall be on file at the permit area during blasting operations. A blaster and at least one other person shall be present at the firing of a blast. Any blaster who is responsible for conducting blasting operations at a blasting site shall be familiar with the site-specific performance standards and give direction and on-the-job training to persons who are not certified and who are assigned to the blasting crew or assist in the use of explosives.

An anticipated blast design shall be submitted if blasting operations will be conducted within 1,000 feet of any building used as a dwelling, public building, school, church or community or institutional building or 500 feet of active or abandoned underground mines. The blast design may be presented as part of a permit application or at a time, before the blast, approved by the Division. The blast design shall contain sketches of the drill patterns, delay periods, and decking and shall indicate the type and amount of explosives to be used, critical dimensions, and the location and general description of structures to be protected, as well as a discussion of design factors to be used, which protect the

OPERATION PLAN

public and meet the applicable airblast, flyrock, and ground-vibration standards. The blast design shall be prepared and signed by a certified blaster. The Division may require changes to the design submitted.

Preblasting survey

At least 30 days before initiation of blasting, the operator shall notify, in writing, all residents or owners of dwellings or other structures located within ½ mile of the permit area how to request a preblasting survey. A resident or owner of a dwelling or structure within ½ mile of any part of the permit area may request a preblasting survey. This request shall be made, in writing, directly to the operator or to the Division, who shall promptly notify the operator. The operator shall promptly conduct a preblasting survey of the dwelling or structure and promptly prepare a written report of the survey. An updated survey of any additions, modifications, or renovations shall be performed by the operator if requested by the resident or owner.

The operator shall determine the condition of the dwelling or structure and shall document any preblasting damage and other physical factors that could reasonably be affected by the blasting. Structures such as pipelines, cables, and transmission lines, and cisterns, wells, and other water systems warrant special attention; however, the assessment of these structures may be limited to surface conditions and other readily available data. The written report of the survey shall be signed by the person who conducted the survey. Copies of the report shall be promptly provided to the Division and to the person requesting the survey. If the person requesting the survey disagrees with the contents and/or recommendations contained therein, he or she may submit to both the operator and the Division a detailed description of the specific areas of disagreement. Any surveys requested more than 10 days before the planned initiation of blasting shall be completed by the operator before the initiation of blasting.

General performance standards

The operator shall notify, in writing, residents within ½ mile of the blasting site and local governments of the proposed times and locations of blasting operations. Such notice of times that blasting is to be conducted may be announced weekly, but in no case less than 24 hours before blasting will occur. Unscheduled blasts may be conducted only where public or operator health and safety so require and for emergency blasting actions. When an operator conducts an unscheduled surface blast incidental to underground coal mining operations, the operator, using audible signals, shall notify residents within ½ mile of the blasting site and document the reason. All blasting shall be conducted between sunrise and sunset unless nighttime blasting is approved by the Division based upon a showing by the operator that the public will be protected from adverse noise and other impacts. The Division may specify more restrictive time periods for blasting.

Blasting signs, warnings, and access control

The operator shall conspicuously place signs reading "Blasting Area" along the edge of any blasting area that comes within 100 feet of any public-road right-of-way, and at the point where any other road provides access to the blasting area and at all entrances to the permit area from public roads or highways, place conspicuous signs which state "Warning! Explosives in Use," which clearly list and describe the meaning of the audible blast warning and all-clear signals that are in use, and which explain the marking of blasting areas and charged holes awaiting firing within the permit area.

Warning and all-clear signals of different character or pattern that are audible within a range of ½ mile from the point of the blast shall be given. Each person within the permit area and each person who resides or regularly works within ½ mile of the permit area shall be notified of the meaning of the signals in the blasting notification.

Access within the blasting areas shall be controlled to prevent presence of livestock or unauthorized persons during blasting and until an authorized representative of the operator has reasonably determined that no unusual hazards, such as imminent slides or undetonated charges, exist and access to and travel within the blasting area can be safely resumed.

Control of adverse effects

Blasting shall be conducted to prevent injury to persons, damage to public or private property outside the permit area, adverse impacts on any underground mine, and change in the course, channel, or availability of surface or ground water outside the permit area.

Airblast shall not exceed the maximum limits specified in the regulations at the location of any dwelling, public building, school, church, or community or institutional building outside the permit area. The maximum airblast and ground-vibration standards shall not apply at structures owned by the permittee and not leased to another person or at structures owned by the permittee and leased to another person, if a written waiver by the lessee is submitted to the Division before blasting.

Flyrock travelling in the air or along the ground shall not be cast from the blasting site: more than one-half the distance to the nearest dwelling or other occupied structure; beyond the area of control; or beyond the permit boundary.

In all blasting operations, except as otherwise authorized, the maximum ground vibration shall not exceed the values approved by the Division. All structures in the vicinity of the blasting area, such as water towers, pipelines and other utilities, tunnels, dams, impoundments, and underground mines shall be protected from damage by establishment of a maximum allowable limit on the ground vibration, submitted by the operator and approved by the Division before the initiation of blasting.

OPERATION PLAN

The maximum allowable ground vibration shall be reduced by the Division beyond the limits otherwise provided by this section, if determined necessary to provide damage protection. The Division may require an operator to conduct seismic monitoring of any or all blasts and may specify the location at which the measurements are taken and the degree of detail necessary in the measurement.

Records of blasting operations

The operator shall retain a record of all blasts for at least 3 years. Upon request, copies of these records shall be made available to the Division and to the public for inspection.

Analysis:

R645-301-524.220 allows the Permittee to submit a specific blasting plan separate from the MRP. The Permittee has opted to submit a detailed blasting plan if and when they propose to blast.

Findings:

The Permittee has met the minimum regulatory requirements for the use of explosives.

MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

Minimum Regulatory Requirements:

Each application shall contain maps, plans, and cross sections which show the mining activities to be conducted, the lands to be affected throughout the operation, and any change in a facility or feature to be caused by the proposed operations, if the facility or feature was shown and described as an existing structure.

The following shall be shown for the proposed permit area:

Affected area maps

The boundaries of all areas proposed to be affected over the estimated total life of all mining activities and reclamation activities, with a description of size, sequence, and timing of phased reclamation activities and treatments. All maps and cross sections used for mining design and mining operations shall clearly show the affected and permit area boundaries in reference to the reclamation work being accomplished.

Mining facilities maps

Location of each facility used in conjunction with mining operations. Such structures and facilities shall include, but not be limited to: buildings, utility corridors, roads, and facilities to be used in mining and reclamation operations or by others within the permit area; each coal storage, cleaning, and loading area; each topsoil, spoil, coal preparation waste, underground development waste, and noncoal waste storage area; each water diversion, collection, conveyance, treatment, storage and discharge facility; each source of waste and each waste disposal facility relating to coal processing or pollution control; each facility to be used to protect and enhance fish and wildlife related environmental values; each explosives storage and handling facility; location of each sedimentation pond, permanent water impoundment, coal processing waste bank, and coal processing water dam and embankment, and disposal areas for underground development waste and excess spoil; and, each plan or profile, at cross sections specified by the Division, of the anticipated surface configuration to be achieved for the affected areas during mining operations.

Mine workings maps

Location and extent of known workings of proposed, active, inactive, or abandoned underground mines, including mine openings to the surface within the proposed permit and adjacent areas. Location and extent of existing or previously surface-mined areas within the proposed permit area.

Monitoring and sampling location maps

Elevations and locations of test borings and core samplings. Elevations and locations of monitoring stations used to gather data on water quality and quantity, subsidence, fish and wildlife, and air quality, as required during mining operations.

Certification Requirements

Cross sections, maps, and plans required to show the design, location, elevation, or horizontal or vertical extent of the land surface or of a structure or facility used to conduct mining and reclamation operations shall be prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, a professional geologist, or in any State which authorizes land surveyors to prepare and certify such cross sections, maps, and plans, a qualified, registered, professional land surveyor, with assistance from experts in related fields such as landscape architecture.

Each detailed design plan for an impounding structure that meets or exceeds the size or other criteria of the Mine Safety and Health Administration, 30 CFR Section 77.216(a) shall: be prepared by, or under the direction of, and certified by a qualified registered professional engineer with assistance from experts in related fields such as geology, land surveying, and landscape architecture; include any geotechnical investigation, design, and construction requirements for the structure; describe the operation and maintenance requirements for each structure; and, describe the timetable and plans to remove each structure, if appropriate.

Each detailed design plan for an impounding structure that does not meet the size or other criteria of 30 CFR Section 77.216(a) shall: be prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, or in any State which authorizes land surveyors to prepare and certify such plans, a qualified, registered, professional land surveyor, except that all coal processing waste dams and embankments shall be certified by a qualified, registered, professional engineer; include any design and construction requirements for the structure, including any required geotechnical information; describe the operation and maintenance requirements for each structure; and, describe the timetable and plans to remove each structure, if appropriate.

Analysis:

Affected Area Maps

The Mine Map, Plate 5-5, shows the areas where mining is expected to occur including the size, sequence and timing of all mining operations. Plate 5-2, Surface Area, shows the area scheduled to be disturbed. Both maps provide information to describe the affected area. The general area hydrology is identified in Plate 7-1.

Mining Facilities Maps

The following is a list of cross-sections and maps provided to show details of the Lila Canyon mine:

Plate 5-2	Mine Facilities Map
Plate 5-5	Mine Workings Map
Plate 7-1	Permit Area Hydrology Map
Plate 7-2	Disturbed Area Hydrology/Watershed
Plate 7-3	Water Rights Locations
Plate 7-4	Water Monitoring Location Map
Plate 7-5	Proposed Sediment Control Map
Plate 7-6	Proposed Sediment Pond
Plate 7-7	Post-Mining Hydrology

Mine Workings Maps

The mine workings map is Plate 5-5 which shows the extent of mining and the mining sequence.

OPERATION PLAN

Monitoring and Sample Location Maps

Operational ground-water and surface-water monitoring sites are listed in Table 7-3, and locations are shown on Plate 7-4. The proposed surface-water monitoring program was established to collect data around the Lila Canyon Mine both above and below the disturbed site at L-1-S, L-2-S, and L-3-S. The sedimentation pond discharge point, L-4-S, and the potential mine discharge point, L-5-S, will be monitored in accordance with UPDES permit requirements. Current UPDES discharge points UT040013-001A and -002A are also shown on Plate 7-4. Locations of seep and spring ground-water monitoring sites L-6-G through L-10-G and water level monitoring wells IPA 1, 2, and 3 are shown on Plate 7-4.

Certification Requirements

All cross sections, maps and plans required by R645-301-512 have been prepared and certified by a registered professional engineer.

Findings:

The Permittee met the minimum requirements for maps, plans and cross sections of the regulations.



RECLAMATION PLAN

RECLAMATION PLAN

GENERAL REQUIREMENTS

Regulatory Reference: PL 95-87 Sec. 515 and 516; 30 CFR Sec. 784.13, 784.14, 784.15, 784.16, 784.17, 784.18, 784.19, 784.20, 784.21, 784.22, 784.23, 784.24, 784.25, 784.26; R645-301-231, -301-233, -301-322, -301-323, -301-331, -301-333, -301-341, -301-342, -301-411, -301-412, -301-422, -301-512, -301-513, -301-521, -301-522, -301-525, -301-526, -301-527, -301-528, -301-529, -301-531, -301-533, -301-534, -301-536, -301-537, -301-542, -301-623, -301-624, -301-625, -301-626, -301-631, -301-632, -301-731, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-732, -301-733, -301-746, -301-764, -301-830.

Minimum Regulatory Requirements:

Provide a plan for the reclamation of the lands within the proposed permit area, showing how the applicant will comply with the regulatory program and the environmental protection performance standards. .

Analysis:

The Division has reviewed each section of the reclamation plan. The Division has found, after conducting this review, that reclamation of the site according to the requirements of the State Program is feasible and that the Permittee has met all regulatory requirements. A detailed discussion of each requirement is discussed below.

Findings:

Information in the application is adequate to meet the minimum general reclamation requirements of the regulations.

POSTMINING LAND USES

Regulatory Reference: 30 CFR Sec. 784.15, 784.200, 785.16, 817.133; R645-301-412, -301-413, -301-414, -302-270, -302-271, -302-272, -302-273, -302-274, -302-275.

Minimum Regulatory Requirements:

In general, all disturbed areas shall be restored in a timely manner to conditions that are capable of supporting: the uses they were capable of supporting before any mining; or higher or better uses.

Provide a detailed description of the proposed use, following reclamation, of the land to be affected within the proposed permit area by surface operations or facilities, including a discussion of the utility and capacity of the reclaimed land to support a variety of alternative uses, and the relationship of the proposed use to existing land-use policies and plans. This description shall explain: how the proposed postmining land use is to be achieved and the necessary support activities which may be needed to achieve the proposed land use; where a land use different from the premining land use is proposed, all materials needed for approval of the alternative use; and, the consideration given to making all of the proposed underground mining activities consistent with surface owner plans and applicable State and local land-use plans and programs.

The description shall be accompanied by a copy of the comments concerning the proposed use from the legal or equitable owner of record of the surface areas to be affected by surface operations or facilities within the proposed permit area and the State and local government agencies which would have to initiate, implement, approve, or authorize the proposed use of the land following reclamation.

Determine premining uses of land. The premining uses of land to which the postmining land use is compared shall be those uses which the land previously supported, if the land has not been previously mined and has been properly managed. The postmining land use for land that has been previously mined and not reclaimed shall be judged on the basis of the land use that existed prior to any mining; Provided that, if the land cannot be reclaimed to the land use that existed prior to any mining because of the previously mined condition, the postmining land use shall be judged on the basis of the highest and best use that can be achieved which is compatible with surrounding areas and does not require the disturbance of areas previously unaffected by mining.

RECLAMATION PLAN

Criteria for alternative postmining land uses. Higher or better uses may be approved as alternative postmining land uses after consultation with the landowner or the land management agency having jurisdiction over the lands, if the proposed uses meet the following criteria: there is a reasonable likelihood for achievement of the use; the use does not present any actual or probable hazard to public health and safety, or threat of water diminution or pollution; and, the use will not be impractical or unreasonable, inconsistent with applicable land use policies or plans, involve unreasonable delay in implementation, or cause or contribute to violation of Federal, State, or local law.

Approval of an alternative postmining land use, may be met by requesting approval through the permit revision procedures rather than requesting such approval in the original permit application. The original permit application, however, must demonstrate that the land will be returned to its premining land use capability. An application for a permit revision of this type must be submitted in accordance with the requirements of filing for a Significant Permit Revision and shall constitute a significant alternation from the mining operations contemplated by the original permit, and shall be subject to the requirements for permits, permit processing, and administrative and judicial of decisions on permits under the regulatory program.

Surface coal mining operations may be conducted under a variance from the requirement to restore disturbed areas to their approximate original contour, if the following requirements are satisfied:

- 1.) The Division grants a variance from approximate original contour restoration requirements.
- 2.) The alternative postmining land use requirements are met.
- 3.) All applicable requirements of the act and the regulatory program, other than the requirement to restore disturbed areas to their approximate original contour, are met.
- 4.) After consultation with the appropriate land use planning agencies, if any, the potential use is shown to constitute an equal or better economic or public use.
- 5.) The proposed use is designed and certified by a qualified registered professional engineer in conformance with professional standards established to assure the stability, drainage, and configuration necessary for the intended use of the site.
- 6.) After approval, where required, of the appropriate State environmental agencies, the watershed of the permit and adjacent areas is shown to be improved.
- 7.) The highwall is completely backfilled with spoil material, in a manner which results in a static factor of safety of at least 1.3, using standard geotechnical analysis.
- 8.) Only the amount of spoil as is necessary to achieve the postmining land use, ensure the stability of spoil retained on the bench, and all spoil not retained on the bench shall be placed in accordance with all other applicable regulatory requirements.
- 9.) The surface landowner of the permit area has knowingly requested, in writing, that a variance be granted, so as to render the land after reclamation, suitable for an industrial, commercial, residential, or public use (including recreational facilities.)
- 10.) Federal, State, and local government agencies with an interest in the proposed land use have an adequate period in which to review and comment on the proposed use.

Analysis:

The postmining land uses will be the same as premining land uses. This will be accomplished through the plan presented in the Reclamation Section of the MRP. Support activities following reclamation to achieve the postmining land uses will include site monitoring; remedial actions, such as regrading, reseeding, and replanting; and fencing as necessary to restrict access and grazing.

The reclamation plan presented in the application will restore the site to a condition capable of supporting the postmining land use. The soils reclamation plan ensures there will be adequate water holding capacity to support vegetation similar to what currently exists on the site or enhanced compared to the current vegetation communities.

The undisturbed area currently has slopes that are considered too steep for grazing (steeper than 2h:1v), and the reclaimed area will also have slopes this steep. These slopes are suitable for the wildlife postmining land use. Since the premining and postmining slopes will be similar, the Division considers the backfilling and grading plan to meet postmining land use requirements even though some postmining slopes will not be suitable for grazing.

The postmining land use is in accordance with the BLM's management plans. Appendix 4-2 contains a letter dated January 15, 1999, from the BLM to the Permittee stating the postmining land use

RECLAMATION PLAN

for the area is wildlife habitat, grazing, and incidental recreation.

Findings:

Information in the MRP meets the postmining land use reclamation requirements of the regulations.

PROTECTION OF FISH, WILDLIFE, AND RELATED ENVIRONMENTAL VALUES

Regulatory Reference: 30 CFR Sec. 817.97; R645-301-333, -301-342, -301-358.

Minimum Regulatory Requirements:

Where wetlands and habitats of unusually high value for fish and wildlife occur, the operator conducting underground mining activities shall provide a description of the measures taken to avoid disturbances to, enhance where practicable, restore, or replace, wetlands and riparian vegetation along rivers and streams and bordering ponds and lakes. Designs and plans for underground mining activities shall include measures to avoid disturbances to, enhance where practicable, or restore habitats of unusually high value for fish and wildlife.

Where fish and wildlife habitat is to be a postmining land use, the plant species to be used on reclaimed areas shall be selected on the basis of the following criteria:

- 1.) Their proven nutritional value for fish or wildlife.
- 2.) Their use as cover for fish or wildlife.
- 3.) Their ability to support and enhance fish or wildlife habitat after the release of performance bonds. The selected plants shall be grouped and distributed in a manner which optimizes edge effect, cover, and other benefits to fish and wildlife.

Where cropland is to be the postmining land use, and where appropriate for wildlife- and crop-management practices, the operator shall intersperse the fields with trees, hedges, or fence rows throughout the harvested area to break up large blocks of monoculture and to diversify habitat types for birds and other animals.

Where residential, public service, or industrial uses are to be the postmining land use and where consistent with the approved postmining land use, the operator shall intersperse reclaimed lands with greenbelts utilizing species of grass, shrubs, and trees useful as food and cover for wildlife.

Analysis:

The proposed disturbed area contains no wetlands or riparian areas, but it does contain other habitat of unusually high value. The Permittee is mitigating loss of this habitat during operations through a habitat enhancement project (see the operation plan section of this TA), and the reclamation plan is designed to enhance the habitat following mining.

The species in the seed mixture will provide good forage and cover for wildlife. The pinyon/juniper area will be reclaimed to a grass/shrub community, and this should enhance the quality of habitat in the area. There are plenty of pinyon/juniper areas nearby to provide cover, but the greatest need is the increased forage that would be provided in a grass/shrub community. Since transplants will not be planted, plants will not be intentionally grouped, but microhabitats created in the backfilling and grading process, including distribution of rocks on the surface, will result in a non-uniform, diverse habitat.

Hydrologic analyses indicate there will be no impacts to surface water sources that may be used by wildlife. The Permittee has committed to replace water lost as a result of mining if there are unforeseen

effects during the operations.

Findings:

Information in the application is adequate to meet the requirements of the fish and wildlife protection requirements of the regulations.

APPROXIMATE ORIGINAL CONTOUR RESTORATION

Regulatory Reference: 30 CFR Sec. 784.15, 785.16, 817.102, 817.107, 817.133; R645-301-234, -301-270, -301-271, -301-412, -301-413, -301-512, -301-531, -301-533, -301-553, -301-536, -301-542, -301-731, -301-732, -301-733, -301-764.

Minimum Regulatory Requirements:

Note :The following requirements have been suspended insofar as they authorize any variance from approximate original contour for surface coal mining operations in any area which is not a steep slope area.

Criteria for permits incorporating variances from approximate original contour restoration requirements.

The Division may issue a permit for nonmountaintop removal mining which includes a variance from the backfilling and grading requirements to restore the disturbed areas to their approximate original contour. The permit may contain such a variance only if the Division finds, in writing, that the applicant has demonstrated, on the basis of a complete application, that the following requirements are met:

- 1.) After reclamation, the lands to be affected by the variance within the permit area will be suitable for an industrial, commercial, residential, or public postmining land use (including recreational facilities).
- 2.) The criteria for the proposed post mining land use will be met.
- 3.) The watershed of lands within the proposed permit and adjacent areas will be improved by the operations when compared with the condition of the watershed before mining or with its condition if the approximate original contour were to be restored. The watershed will be deemed improved only if: the amount of total suspended solids or other pollutants discharged to ground or surface water from the permit area will be reduced, so as to improve the public or private uses or the ecology of such water, or flood hazards within the watershed containing the permit area will be reduced by reduction of the peak flow discharge from precipitation events or thaws; the total volume of flow from the proposed permit area, during every season of the year, will not vary in a way that adversely affects the ecology of any surface water or any existing or planned use of surface or ground water; and, the appropriate State environmental agency approves the plan.
- 4.) The owner of the surface of the lands within the permit area has knowingly requested, in writing, as part of the application, that a variance be granted. The request shall be made separately from any surface owner consent given for right-of-entry and shall show an understanding that the variance could not be granted without the surface owner's request.

If a variance is granted, the requirements of the post mining land use criteria shall be included as a specific condition of the permit, and, the permit shall be specifically marked as containing a variance from approximate original contour.

A permit incorporating a variance shall be reviewed by the Division at least every 30 months following the issuance of the permit to evaluate the progress and development of the surface coal mining and reclamation operations to establish that the operator is proceeding in accordance with the terms of the variance. If the permittee demonstrates to the Division that the operations have been, and continue to be, conducted in compliance with the terms and conditions of the permit, the review specified need not be held. The terms and conditions of a permit incorporating a variance may be modified at any time by the Division, if it determines that more stringent measures are necessary to ensure that the operations involved are conducted in compliance with the requirements of the regulatory program. The Division may grant variances only if it has promulgated specific rules to govern the granting of variances in accordance with the provisions of this section and any necessary, more stringent requirements.

Analysis:

The definitions of AOC contained in the Surface Mining Control and Reclamation Act (SMCRA) and the Utah coal rules are primarily statements of the objectives of post-mining backfilling and grading so that the area "closely resembles the general surface configuration of the land prior to mining" and "blends into and complements the drainage pattern of the surrounding terrain". At the same time, reclamation performance standards must be met, including controlling erosion, establishing mass stability and establishing permanent, diverse and effective vegetative cover. In some circumstances, replicating

RECLAMATION PLAN

the original contour may only be possible at the expense of one or more reclamation performance standards. In other circumstances, it may be possible to achieve nearly exact original contour and simultaneously satisfy all the other regulatory requirements. Although the principles of regulatory construction suggest that specific regulatory requirements take precedence over general provisions, this directive is intended to reconcile the specific performance standard requirements of the regulatory program with the general definitions of AOC in a way that accomplishes the objectives of SMCRA.

The underlying objectives of the AOC requirements relate to the assumption that post-mining features which mimic pre-mining features are most likely to quickly achieve mass and erosional stability, revegetation, hydrologic balance and productive post-mining land use, all of which are the objectives of the reclamation performance standards. AOC also addresses aesthetic considerations. In order to evaluate methods for achieving AOC, the underlying objectives and challenges of reclamation at the site in question must first be identified.

Final Surface Configuration

The main question that is used to determine if the site meets this requirement is "Does the postmining topography, excluding elevation, closely resemble its premining configuration?" The Division relies on the judgement of the technical staff that reviews the reclamation plan. The staff reviewed all the premining and post mining topographic maps and cross sections and determined that this condition is met based on the following:

- The premining and postmining topography as shown on cross-sections on Figure 2 in Appendix 5-7 are similar. The postmining topography will vary to accommodate coal mine waste, however, AOC will be achieved.
- The amount of non-topsoil material that will be handled during reclamation is 44,201 cubic yards see worksheet 3 in Appendix 8-1.
- By comparison the amount of topsoil to be handled during reclamation is 65,436 cubic yards.

All Spoil Piles to be Eliminated

No spoil piles are associated with this site.

All Highwalls to be Eliminated

The Permittee states in Section 553.120 the following:

Minor highwalls may be created with the development of the rock slope portals. Upon completion of mining, these entries will be sealed as per Closure for Mine Openings Appendix 5-6, and highwalls will be eliminated during the reclamation phase of the operation. During reclamation, suitable materials will be placed against the portals. This material will be shaped to eliminate the highwall and to bring the slope back to the approximate original contour.

Plate 5-9 shows the premining, operational and postmining cross sections for all portals. The two portals that provide access to the mine via the rock tunnel will have highwalls or face-ups that are approximately the same height as the openings, which is 6 feet. The highwalls may be slightly taller because the Permittee may need to remove loose rock. Since the portal face up areas are in a nearly vertical cliff, the Permittee will eliminate the highwall by backfilling against the portal face-up.

The fan portal will have a 17-foot highwall. Some of the cliff will have to be removed when the fan facility is constructed. The highwall will be constructed in a high cliff. After reclamation the highwall will be backfilled to the premining topography.

Safety is a major concern with highwalls. Since the Lila Canyon highwalls are in an existing cliff, the existence and reclamation of the highwalls will not create additional safety hazards. The steep cliffs above the two lower reclaimed portals will prevent people, livestock and wildlife from traveling over the highwall areas. People, livestock and wildlife traveling over the upper reclaimed highwall will face the same hazards as found on any other slope in the area.

Because the highwalls areas will be restored to approximate premining topography the Division finds that the highwall elimination plans meets the minimum requirements of R645-301-553.120.

Hydrology

The main concerns with hydrology are that the drainages are restored, sediment is controlled and that no hazardous or toxic discharges will occur. The Division considers that those conditions will be met when the hydrologic reclamation requirements are met.

Post-Mining Land Use:

The Division has found that the application meets the general post-mining land use requirements

Variance from AOC:

The Permittee did not request a variance from AOC.

General Backfilling and Grading:

The Division analysis of the general backfilling and grading requirements is in the backfilling and grading section of this TA. The Division has found the general backfilling and grading requirements are satisfied.

RECLAMATION PLAN**Findings:**

The Permittee meets the minimum approximate original contour restoration requirements of the regulations.

BACKFILLING AND GRADING

Regulatory Reference: 30 CFR Sec. 785.15, 817.102, 817.107; R645-301-234, -301-537, -301-552, -301-553, -302-230, -302-231, -302-232, -302-233.

Minimum Regulatory Requirements:**General**

Disturbed areas shall be backfilled and graded to: achieve the approximate original contour; eliminate all highwalls, spoil piles, and depressions; achieve a postmining slope that does not exceed either the angle of repose or such lesser slope as is necessary to achieve a minimum long term static safety factor of 1.3 and to prevent slides; minimize erosion and water pollution both on and off the site; and, support the approved postmining land use.

The postmining slope may vary from the approximate original contour when approval is obtained from the Division for a variance from approximate original contour requirements, or when incomplete elimination of highwalls in previously mined areas is allowed under the regulatory requirements. Small depressions may be constructed if they are needed to retain moisture, minimize erosion, create and enhance wildlife habitat, or assist revegetation.

If it is determined by the Division that disturbance of the existing spoil or underground development waste would increase environmental harm or adversely affect the health and safety of the public, the Division may allow the existing spoil or underground development waste pile to remain in place. Accordingly, regrading of settled and revegetated fills to achieve approximate original contour at the conclusion of underground mining activities shall not be required if: the settled and revegetated fills are composed of spoil or nonacid- or nontoxic-forming underground development waste; the spoil or underground development waste is not located so as to be detrimental to the environment, to the health and safety of the public, or to the approved postmining land use; stability of the spoil or underground development waste must be demonstrated through standard geotechnical analysis to be consistent with backfilling and grading requirements for material on the solid bench (1.3 static safety factor) or excess spoil requirements for material not placed on a solid bench (1.5 static safety factor); and, the surface of the spoil or underground development waste shall be vegetated in accordance with the revegetation standards for success, and surface runoff shall be controlled in accordance with the regulatory requirements for diversions.

Spoil shall be returned to the mined-out surface area. Spoil and waste materials shall be compacted where advisable to ensure stability or to prevent leaching of toxic materials. Spoil may be placed on the area outside the mined-out surface area in nonsteep slope areas to restore the approximate original contour by blending the spoil into the surrounding terrain if the following requirements are met: all vegetative and organic materials shall be removed from the area; the topsoil on the area shall be removed, segregated, stored, and redistributed in accordance with regulatory requirements; the spoil shall be backfilled and graded on the area in accordance with the general requirements for backfilling and grading.

Disposal of coal processing waste and underground development waste in the mined-out surface area shall be in accordance with the requirements for the disposal of spoil and waste materials except that a long-term static safety factor of 1.3 shall be achieved.

Exposed coal seams, acid- and toxic-forming materials, and combustible materials exposed, used, or produced during mining shall be adequately covered with nontoxic and noncombustible materials, or treated, to control the impact on surface and ground water, to prevent sustained combustion, and to minimize adverse effects on plant growth and the approved postmining land use.

Cut-and-fill terraces may be allowed by the Division where: needed to conserve soil moisture, ensure stability, and control erosion on final-graded slopes, if the terraces are compatible with the approved postmining land use; or, specialized grading, foundation conditions, or roads are required for the approved postmining land use, in which case the final grading may include a terrace of adequate width to ensure the safety, stability, and erosion control necessary to implement the postmining land-use plan.

Preparation of final-graded surfaces shall be conducted in a manner that minimizes erosion and provides a surface for replacement of topsoil that will minimize slippage.

Previously mined areas

Remining operations on previously mined areas that contain a preexisting highwall shall comply with all other reclamation requirements except as provided herein. The requirement that elimination of highwalls shall not apply to remining operations where the volume

RECLAMATION PLAN

of all reasonably available spoil is demonstrated in writing to the Division to be insufficient to completely backfill the reaffected or enlarged highwall. The highwall shall be eliminated to the maximum extent technically practical in accordance with the following criteria:

- 1.) All spoil generated by the remaining operation and any other reasonably available spoil shall be used to backfill the area. Reasonably available spoil in the immediate vicinity of the remaining operation shall be included within the permit area.
- 2.) The backfill shall be graded to a slope which is compatible with the approved postmining land use and which provides adequate drainage and long-term stability.
- 3.) Any highwall remnant shall be stable and not pose a hazard to the public health and safety or to the environment. The operator shall demonstrate, to the satisfaction of the Division, that the highwall remnant is stable.
- 4.) Spoil placed on the outslope during previous mining operations shall not be disturbed if such disturbances will cause instability of the remaining spoil or otherwise increase the hazard to the public health and safety or to the environment.

Backfilling and grading on steep slopes

Underground mining activities on steep slopes shall be conducted so as to meet other applicable regulatory requirements and the requirements of this section. The following materials shall not be placed on the downslope: spoil; waste materials of any type; debris, including that from clearing and grubbing; abandoned or disabled equipment; land above the highwall shall not be disturbed unless the Division finds that this disturbance will facilitate compliance with the environmental protection standards and the disturbance is limited to that necessary to facilitate compliance; and, woody materials shall not be buried in the backfilled area unless the Division determines that the proposed method for placing woody material within the backfill will not deteriorate the stable condition of the backfilled area.

Special provisions for steep slope mining

No permit shall be issued for any operations covered by steep slope mining, unless the Division finds, in writing, that in addition to meeting all other regulatory requirements, the operation will be conducted in accordance with the requirements for backfilling and grading on steep slopes. Any application for a permit for surface coal mining and reclamation operations covered by steep slope mining shall contain sufficient information to establish that the operations will be conducted in accordance with the requirements for backfilling and grading on steep slopes.

This section applies to any person who conducts or intends to conduct steep slope surface coal mining and reclamation operations, except: where an operator proposes to conduct surface coal mining and reclamation operations on flat or gently rolling terrain, leaving a plain or predominantly flat area, but on which an occasional steep slope is encountered as the mining operation proceeds; where a person obtains a permit under the provisions for mountaintop removal mining; or, to the extent that a person obtains a permit incorporating a variance from approximate original contour restoration requirements.

Analysis:

The general backfilling and grading requirements are as follows:

Achieve AOC:

The AOC issues are discussed in the AOC section of this TA. The Division made the finding that the reclamation plan is adequate to insure that the site can be reclaimed to the approximate original contour requirements.

Elimination of Highwalls Spoil Piles and Depressions:

Highwall elimination is discussed in the AOC section of this TA. The highwall elimination plan shows that all highwalls will be fully reclaimed. No spoil piles will be associated with the site. No major depressions will be present after reclamation, see Plate 5-6, Post Mining Topography. Minor depressions (pocks) may be left after topsoil placement to stabilize the surface and retain moisture. The pocks generally fill in within a few years.

RECLAMATION PLAN

Slope Stability:

The slope stability requirements are in R645-301-553.130, which states that the postmining slope will not exceed either the angle of repose or such lesser slope as is necessary to achieve a minimum long-term static safety factor of 1.3 and prevent slides. Some exceptions to those requirements are allowed on pre-SMCRA sites. Since Lila Canyon is a post-SMCRA site those exemptions do not apply. The reclaimed slopes at the Lila Canyon mine site will meet the slope stability requirements because:

- The angle of repose for materials in and around the Lila Canyon site is approximately 35°, a 1.5h:1v slope. The steepest reclaimed slope is the upper portion of the slope by the fan portal, and that slope will not exceed 35°.
- The safety factor calculations for the reclaimed slopes are in Appendix 5-5. The reclaimed slopes that were analyzed will have a minimum static safety factor of 4.8 under dry conditions and 3.1 under saturated conditions. In addition to the slopes listed in Appendix 5-5 the Division and the Permittee conducted additional slope stability studies using STABLE, a slope stability program.
- The backfilling and grading plan has been prepared by a registered professional engineer. The plan was designed to ensure that the slopes will be stable and resistant to slides. By keeping the slope angle less than the angle-of-repose and by having the safety factor greater than 1.3, slides will be prevented from occurring. Minor slide and surface slumping will be prevented by pocking the steep slope surfaces. Pocking interlocks the topsoil with the subsoil layers.

Minimize Erosion and Water Pollution:

The plans for minimizing erosion and water pollution are detailed in Appendix 7-4. The Division has reviewed the reclamation hydrology issues for the Lila Canyon mine site and found that minimum requirements have been met.

Post-Mining Land Use:

The post mining land-use finding is in the post-mining land use section of the TA. The reclaimed contours will be compatible with the post mining land use. The postmining land use is wildlife habitat, grazing, and incidental recreation, which is identical to the premining land use. The postmining land use is in accordance with the BLM's management plans. See Appendix 4-2 of the MRP for a BLM postmining land use approval letter.

Settled and Revegetated Fills:

The variances from AOC and other requirements for existing spoil or underground development waste do not apply to the Lila Canyon Mine since those materials are not present on the site before the permit is issued.

Spoil Disposal:

Spoil is defined as overburden removed during coal mining and reclamation. Overburden is defined as material that overlies a coal deposit with the exception of topsoil. The only spoil that will be generated at the Lila Canyon Mine will be at the fan portal. The spoil will be used as backfill at the fan portal site. The proper compaction of spoil is a performance standard that the Permittee must meet during reclamation.

Disposal of Coal Mine Waste and Underground Development Waste:

The Division considers the material from the rock slope tunnels to be underground development waste; therefore, that material must be disposed in a refuse pile. The backfilling and grading requirements that apply to disposal of coal mine waste and underground development waste (refuse pile) are as follows:

- The final configuration for the refuse pile will be suitable for the approved postmining land use. Terraces may be constructed on the outslope of the refuse pile if required for stability, control of erosion, conservation of soil moisture, or facilitation of the approved postmining land use. The grade of the outslope between terrace benches will not be steeper than 2h:1v (50 percent).
- Following final grading of the refuse pile, the coal mine waste will be covered with a minimum of four feet of the best available, nontoxic and noncombustible material.
- A long-term static safety factor of 1.3 will be achieved.

The reclamation plan for the refuse pile is in Appendix 5-7. The refuse pile will meet the requirements of R645-301-553.250 because:

- The reclaimed mine site including the refuse pile will meet the postmining land use.
- The coal mine waste and underground development waste will be buried below grade in a depression in the disturbed area. Terraces will not be used and the grade of the outslopes will not be steeper than 3h:1v. See drawing 5-7B for details.
- The Permittee has committed to covering the refuse with 4 feet of nontoxic and noncombustible materials. See drawing 5-7B for details.
- The slopes in and around the reclaimed refuse pile will have very gentle slopes with a stability factor greater than 8, (see Appendix 5-7). The minimum safety factor requirement is 1.3, therefore the slopes of the reclaimed refuse pile will be considered stable.

Exposed Coal Seams and Acid- and Toxic-Forming Materials and Combustible Materials:

RECLAMATION PLAN

The Permittee has committed to cover all such materials with 4 feet of fill materials. The only exposed coal will be at the fan portal area. The cross section of the reclaimed fan portal in Plate 5-9 shows that the coal seam will be backfilled by more than 4 feet of fill materials.

Cut and Fill Terraces:

The Permittee does not propose to use cut and fill terraces at the Lila Canyon Mine.

Final Preparation of Graded Surfaces:

The proper preparation of the graded surface is a performance standard that the Permittee must meet during reclamation.

Previously Mined Areas:

There are no known previously mined areas in the disturbed area boundaries for the Lila Canyon site.

Backfilling and Grading on Steep Slopes

The section backfilling and grading on steep slopes or special provisions for steep slope mining are not considered for this TA, because Lila Canyon disturbed area is not considered a steep slope mine. Special provisions for steep slope mining apply when the permittee plans to get a variance from AOC requirements. Since the permittee did not apply to an AOC variance they are not required to address these requirements.

Findings:

The Permittee meets the minimal backfilling and grading requirements of the regulations.

MINE OPENINGS

Regulatory Reference: 30 CFR Sec. 817.13, 817.14, 817.15; R645-301-513, -301-529, -301-551, -301-631, -301-748, -301-765, -301-748.

Minimum Regulatory Requirements:

Each exploration hole, other drillhole or borehole, shaft, well, or other exposed underground opening shall be cased, lined, or otherwise managed as approved by the Division to prevent acid or other toxic drainage from entering ground and surface waters, to minimize disturbance to the prevailing hydrologic balance and to ensure the safety of people, livestock, fish and wildlife, and machinery in the permit area and adjacent area. Each exploration hole, drill hole or borehole or well that is uncovered or exposed by mining activities within the permit area shall be permanently closed, unless approved for water monitoring or otherwise managed in a manner approved by the Division. Use of a drilled hole or monitoring well as a water well must meet the provisions required to protect the hydrologic balance. This section does not apply to holes drilled and used for blasting, in the area affected by surface operations.

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

RECLAMATION PLAN

Each exploration hole, other drill hole or borehole, shaft, well, and other exposed underground opening which has been identified in the approved permit application for use to return underground development waste, coal processing waste or water to underground workings, or to be used to monitor ground-water conditions, shall be temporarily sealed until actual use.

When no longer needed for monitoring or other use approved by the Division upon a finding of no adverse environmental or health and safety effects, or unless approved for transfer as a water well, each shaft, drift, adit, tunnel, exploratory hole, entry way or other opening to the surface from underground shall be capped, sealed, backfilled, or otherwise properly managed, as required by the Division and consistent with the requirements of 30 CFR Section 75.1711. Permanent closure measures shall be designed to prevent access to the mine workings by people, livestock, fish and wildlife, machinery and to keep acid or other toxic drainage from entering ground or surface waters.

Analysis:

The Permittee committed in Section 529 of the MRP to seal all underground openings according to the portal sealing plan in Appendix 5-6 when no longer needed. The portals sealing plan meets Division and MSHA requirements.

Three ground-water monitoring wells and one water supply well are identified on or adjacent to the site. There are no plans for other wells on this site; however, the application says that if any wells are installed in the future, requirements of this section will be met. The Permittee has submitted plans (Section 765) to seal all wells.

As part of the performance standards the Permittee will be required by the Division to barricade and fence mine entries that are temporarily inactive in the permit area. These mine entries will be posted with warning signs. The barricades will be periodically inspected and maintained.

Findings:

The Permittee meets the minimum mine openings requirements of the regulations.

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-240.

Minimum Regulatory Requirements:

Redistribution

Topsoil materials shall be redistributed in a manner that: achieves an approximately uniform, stable thickness consistent with the approved postmining land use, contours, and surface-water drainage systems; prevents excess compaction of the materials; and, protects the materials from wind and water erosion before and after seeding and planting.

Before redistribution of the material, the regarded land shall be treated if necessary to reduce potential slippage of the redistribution material and to promote root penetration. If no harm will be caused to the redistributed material and reestablished vegetation, such treatment may be conducted after such material is replaced.

The Division may choose not to require the redistribution of topsoil or topsoil substitutes on the approved postmining embankments of permanent impoundments or of roads if it determines that placement of topsoil or topsoil substitutes on such embankments is inconsistent with the requirement to use the best technology currently available to prevent sedimentation, and, such embankments will be otherwise stabilized.

Nutrients and soil amendments shall be applied to the initially redistributed material when necessary to establish the vegetative cover.

The Division may require that the B horizon, C horizon, or other underlying strata, or portions thereof, removed and segregated, stockpiled, be redistributed as subsoil in accordance with the requirements of the above if it finds that such subsoil layers are necessary to comply with the revegetation requirements.

RECLAMATION PLAN

Analysis:**Soil Redistribution**

In Section 232.500, the application says subsoil ranging in thickness from 12 to 30 inches from cutslope sites will be used as fill material for site development and replaced in an approximate original sequence during reclamation. Subsoil from Soil Map Units SBJ, DSH, and VBJ used as construction fill will be identified in as-built maps and used appropriately during reclamation as root zone subsoils (as discussed in Sections 241, 232.100 and 232.500).

Section 241 says that after AOC is achieved, the disturbed surface will be scarified prior to soil redistribution. Rippers mounted on the rear of a dozer will break through the soil layers to a minimum depth of 16 inches.

The grading sequence is itemized in Section 241 as follows:

1. Grade all areas where no subsoil is being stored.
2. Replace subsoil on areas from which it was moved.
3. Rip the subsoil to a minimum of 16 inches.
4. Replace topsoil.
5. Replace boulders.
6. Gouge the topsoil.

Soil replacement volumes are shown in the table below. Soil replacement includes topsoil placement and 4 feet of soil cover over the refuse area. This table does not show volumes of subsoil to be used in pad construction.

After topsoil redistribution, pocking will be the primary method for roughening the surface. Pocking is described in Figure 1, Appendix 5-8, as imprinting the soil surface with a pattern of depressions measuring approximately 36 inches across by 8 inches deep. The purposes for pocking are to capture and retain moisture and to provide a cradle for seedlings and vegetation. Best available technology will be used for enhancing the ability of the soil to absorb moisture.

Section 242.100 says previously stockpiled topsoil will be redistributed on the same areas in a thickness which approximates the reclaimed thickness on the scarified, post-mining graded surface. The plan states that every reasonable effort will be made to replace the same thickness of salvaged soil to each respective area.

On flat areas, soil will be reapplied using a road grader and/or crawler tractor. On steep slope areas, soil will be reapplied using a front-end loader, crawler tractor, and/or trackhoe. Boulders will be replaced to achieve a near natural surface condition.

Soil Replacement Depths and Volumes

Soil Replacement Reclamation Needs	Soil Depth (inches)	Acres	Soil Volume (cubic yards)
Structural Fill & Refuse Storage	30**	3.4	13,307
Topsoil* SBG	18	11.12	26,910
Topsoil* VBJ	18	4.46	10,793
Topsoil* XBS	12	4.77	7,697
Topsoil* DSH	18	1.39	3,364
Topsoil* RBL	8	2.56	2,753
Topsoil* RBT	6	0.76	613
Total			65,436

* Since the A horizons are less than 6 inches, the plan identifies topsoil as the top 18 inches or all material down to shale, whichever is less.

** Does not include the 18 -inch topsoil placement.

Soil Nutrients and Amendments

Section 241 states that an inoculum will be applied to the soil to help assist in reactivating and regenerating soil organisms. The seed mixture will be either hand broadcast over the area and raked into the soil surface, or sprayed on the surface using hydromulch. A wood fiber mulch and tackifier will be hydro-sprayed over the seedbed.

Section 231.300 and Section 243 state that topsoil will be sampled and tested prior to replacement to determine what nutrients are necessary at reclamation time. Grab samples will be collected from the stockpile at various locations and depths. Fertilizer, if needed, will be applied to the topsoil prior to seeding and mulching activities. Sampling will either be performed by a Certified Soil Scientist, or by a person considered to be qualified by the Permittee and DOGM.

Soil Stabilization

Vegetation will be the primary method for controlling erosion and fugitive dust (Section 244.100). Other measures that will help in erosion control and soil stabilization are pocking and rock placement. In addition, wood fiber mulch will be applied at a rate of 2,000 pounds per acre to the reclaimed areas that have been graded and covered by topsoil or substitute topsoil.

Section 244.200 states that pocking will be the primary method used to roughen the soil surface as per Figure 1 in Appendix 5-8.

Findings:

RECLAMATION PLAN

Information provided in the application is adequate to meet the minimum topsoil and subsoil reclamation requirements of the regulations.

ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

Regulatory Reference: 30 CFR Sec. 701.5, 784.24, 817.150, 817.151; R645-100-200, -301-513, -301-521, -301-527, -301-534, -301-537, -301-732.

Minimum Regulatory Requirements:**Reclamation**

A road not to be retained under an approved postmining land use shall be reclaimed in accordance with the approved reclamation plan as soon as practicable after it is no longer needed for mining and reclamation operations. This reclamation shall include: closing the road to traffic; removing all bridges and culverts unless approved as part of the postmining land use; removing or otherwise disposing of road-surfacing materials that are incompatible with the postmining land use and revegetation requirements; reshaping cut and fill slopes as necessary to be compatible with the postmining land use and to complement the natural drainage pattern of the surrounding terrain; protecting the natural drainage patterns by installing dikes or cross drains as necessary to control surface runoff and erosion; and, scarifying or ripping the roadbed, replacing topsoil or substitute material and revegetating disturbed surfaces.

Retention

A road to be retained for an approved postmining land use shall be classified as a primary road and designed constructed and maintained in accordance with the requirements for primary roads and in consideration of the approved postmining land use.

Analysis:

The Permittee committed to reclaim all roads including removal of culverts in the disturbed area. The road surfaces (road base gravel) will be removed and buried on site and covered with a minimum of two feet of material. If, in the future, the Permittee proposes to bury asphalt on site, the Division will require at least four feet of growth medium over this material. The roads will be regraded, ripped and topsoiled before seeding.

Findings:

The Permittee has met the minimum regulatory requirements for roads and other transportation facilities.

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 784.14, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-301-512, -301-513, -301-514, -301-515, -301-532, -301-533, -301-542, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-733, -301-742, -301-743, -301-750, -301-751, -301-760, -301-761.

Minimum Regulatory Requirements:**Hydrologic reclamation plan**

The application shall include a plan, with maps and descriptions, indicating how the relevant regulatory requirements will be met. The plan shall be specific to the local hydrologic conditions. It shall contain the steps to be taken during mining and reclamation through bond release to minimize disturbance to the hydrologic balance within the permit and adjacent areas; to prevent material damage outside the permit area; and to meet applicable Federal and State water quality laws and regulations. The plan shall include the measures to be taken to: avoid acid or toxic drainage; prevent, to the extent possible using the best technology currently available, additional contributions of suspended solids to streamflow; provide water treatment facilities when needed; and control drainage. The plan shall specifically address any potential adverse hydrologic consequences identified in the PHC determination and shall include preventive and remedial measures.

RECLAMATION PLAN

Each application shall contain descriptions, including maps and cross sections, of stream channel diversions and other diversions to be constructed within the proposed permit area to achieve compliance with the performance standards for those structures.

Postmining rehabilitation of sedimentation ponds, diversions, impoundments, and treatment facilities

Before abandoning a permit area or seeking bond release, the operator shall ensure that all temporary structures are removed and reclaimed, and that all permanent sedimentation ponds, diversions, impoundments, and treatment facilities meet the requirements of this Chapter for permanent structures, have been maintained properly and meet the requirements of the approved reclamation plan for permanent structures and impoundments. The operator shall renovate such structures if necessary to meet the requirements of this Chapter and to conform to the approved reclamation plan.

Analysis:

Ground-water Monitoring

Ground-water monitoring will continue through mining and reclamation until bond release (Section 731.214). The same ground-water monitoring plan will be used during mine operation and reclamation. Parameters are listed in Table 7-5.

Surface-water Monitoring

Surface-water monitoring will continue through operational and reclamation periods, until bond release (Section 731.224). Locations, parameters, and sampling frequency (other than UPDES discharge points) may be modified by the Division or by the Permittee with the approval of the Division. Parameters are listed in Table 7-4.

Acid and Toxic-forming Materials

To ensure surface and ground waters will not be polluted by acid or toxic materials, the slope-rock material (underground development waste) will be examined and tested as necessary to determine acid- and toxic-forming potential (MRP Section 536, ~~of the plan page 82 B#005062~~). ~~Three samples (B# 005122) will be taken of the initial rock slope development excavation. These samples will be analyzed according to Table 2 of Appendix 5-7. In Appendix 5-7, the Permittee commits to take a sample of coal processing waste for every 10,000 tons of waste disposed of in the refuse pile (B# 005122). These samples will be analyzed according to the parameters listed in Table 2 of Appendix 5-7 (B#005125). The Division requires that the slope-rock material be disposed of in a refuse pile. At a minimum, the material in the refuse pile must be covered with 4 feet of non-acid and non-toxic forming material. (See Chapters 2 B#004481, 5 B#004979, and 7 B#005332, and Appendix 5-7 B#005119 for details.)~~

~~Total sulfur in the coal is expected to be 1.1 to 1.3%, one-third of which is pyritic sulfur (Section 6.5.4.2 B# 005192). Analyses are provided in Appendix 6-2 (B#005306). If the waste is similar in sulfur content to the coal, the acid generating potential would be 1.3% Total Sulfur times 31.25 which is 40.63 Tons/1000 Tons of waste.⁷⁷ This potential acidity will be effectively neutralized by the soil encapsulating it since the soils in the vicinity of the refuse disposal area have a percent calcium carbonate equivalent to 200 Tons/1000 Tons of Neutralization Potential. This Neutralization Potential value (200 Tons/1000~~

⁷⁷U.S. EPA, 1978, EPA 600/278-054. Method 3.2.3, pp47-55 and Method 3.2.6 pg 60.

RECLAMATION PLAN

Tons) would adequately neutralize the 40 Tons/ 1000 Tons of Potential Acidity generated by the mine waste, assuming the amount of sulfur in the mine waste is similar to the amount of sulfur in the coal.

The Permittee states on page B# 005195 that with over 100 years of mining in the Sunnyside Mining Operation, there have been no proven problems with acid- or toxic-forming materials (Section 6.5.5.1). The Division is aware of an instance where acid water formed at the Sunnyside slurry pond, but it did not cause problems or offsite impacts. The Division took issue with this statement (B#000744), because the collective memory of Division personnel was to the contrary. This statement is also contradicted by the evidence of acidic mine drainage seeping from the Sunnyside Refuse Disposal Facility.⁸ The Coarse Refuse Seep (CRS) at the base of the Sunnyside refuse disposal facility developed as a result of water percolating from the slurry ponds down through the refuse. When compared to adjacent springs, the seep at the base of the 100 year old coal processing waste disposal site had elevated concentrations of iron, manganese, sulfates, boron, exchangeable acidity and dissolved solids. However, there was no offsite flow and a small wetland developed that effectively reduced the soluble metals in the water.⁹ There has been no flow at this seep since the source of the water (the preparation plant) has been reclaimed.¹⁰ The refuse itself is currently being re-mined by Sunnyside Cogeneration Association.

The Division does not expect an acid mine drainage problem to occur at the Lila Canyon Mine because any minor amounts of percolating waters into the refuse pile will not be concentrated washing of coal is not proposed (B# 005121); the dry refuse will be disposed of on high ground, and the refuse will be mounded and buried below four feet of growth medium. With low precipitation (less than 13 inches annually) and four feet of soil cover, there will be limited contact of between water with the and refuse.

Transfer of Wells

There are three monitoring wells and one water-supply well in or adjacent to the permit area. There are no plans to transfer any wells to any other party. When these wells are no longer required, they will be sealed in a safe, environmentally sound manner in accordance with regulations (Sections 631.200, 722.400, and 765).

Discharges Into an Underground Mine

The Permittee has not proposed discharges into an underground mine.

Gravity Discharges

⁸Sauer, Henry. 1996. Investigation of Acid Generation in a Coal Processing Waste Disposal Facility: Water Quality Impacts and Mineral Precipitate Formation. In. Planning Rehabilitation and Treatment of Disturbed Lands. 7th Billings Symposium. March 17 - March 23, 1996. Billings, Montana. Montana State University Reclamation Research Unit Publication No. 9603.

⁹Email communication from Karl Houskeeper to Susan White, 1/3/02.

¹⁰Personal communication between Priscilla Burton and Ken Wyatt, Division Water Database Hydrologist, May 2000.)

Based on water monitoring results and historical information, it is unlikely water levels will ever reach the intersection of the tunnel and coal seam. Therefore, gravity discharge from the surface entries is also unlikely. Section 731.520 explains why gravity discharges from the mine are not expected after mine closure. The coal seam to be mined dips away from the portal site at approximately 12 percent. If water is encountered in the mining, it will likely be at a static level far below the exposed outcrop or rock slopes.

Water Quality Standards and Effluent Limitations

Water monitoring, both surface and ground water, will continue until bond release. Water monitoring data will be submitted every three months for each monitoring location. Should analysis of any sample indicate non-compliance with permit conditions, the Permittee will notify the Division and take immediate steps to correct the problem, and, if necessary, provide notice to anyone whose health and/or safety is in imminent danger due to non-compliance.

Diversions

All disturbed and undisturbed area diversions will be removed during the backfilling and recontouring reclamation period, except culvert UC-2. As undisturbed drainage culverts are removed, straw bales or silt fences will be installed for sediment control. Disturbed area ditches DD-11 and DD-12 will be enlarged as necessary and redesignated RD-1 and RD-2.

When the operations meet Phase II bond release standards, all major sediment control structures will be removed. Reclamation ditches RD-1 and RD-2 will be reclaimed and the undisturbed culvert UC-2 will be cut off and removed at the location of the principal spillway. A portion of culvert UC-2 will remain beneath the county road to maintain drainage following mining. The culvert headwall will be protected with riprap. The upper section of culvert UC-2 will be removed and the channel restored. A newly formed channel will be constructed at grade to intercept the inlet of the culvert at its intersection with the road. The road embankment and associated new channel will be armored with an underlayment of filter material, with D⁵⁰-30 -inch rip-rap protection.

Although reclamation designs are currently adequate, the Permittee has committed to enhancing final design and reclamation plans prior to conducting reclamation activities, which will incorporate state of the art technology in mining and channel reclamation.

Stream Buffer Zones

There no perennial stream channels on the proposed permit area. The Lila Canyon channel is considered the only intermittent channel that could meet the criteria for stream buffer zone protection. The Permittee has identified that development will take place adjacent to the Lila Canyon channel, within 100 feet of an intermittent stream channel. There is a potential that mine water could be discharged into the channel during the operational phase of the mine.

A stream buffer zone will be established to protect the channel. The stream buffer zone will have signs and markers to prevent development in the channel. Any development for discharges into the

RECLAMATION PLAN

channel will be submitted in amended plans. The Permittee has committed to studying the channel morphology prior to any discharges and has committed to reclaim all constructed facilities if any are developed.

Sediment Control Measures

All drainage ditches (except the a section of UC-2 under the county road) and sediment controls are considered temporary and will be removed when no longer required. Upon completion of Phase II bond release, the sedimentation pond will be removed and the area will be reclaimed in accordance with the approved plan. The south fork of Coleman Wash will be regraded to AOC and revegetated according to the revegetation plan. The disturbed area will be reclaimed in accordance with the reclamation plan, including any plans enhanced with state of the art technology and approved by the Division.

Siltation Structures

All siltation structures will be removed during reclamation. See Appendix 7-4 for details on removal of siltation structures.

As indicated in Section 761, the sedimentation pond will remain in place until the erosion control and vegetation requirements for Phase II bond release are met. This will be at least 2 years after the last augmented seeding.

Sedimentation Ponds

The proposed sedimentation pond is considered temporary, and will be removed during final reclamation. The sedimentation pond will be maintained until the disturbed area has been meets sediment control and revegetation standards for Phase II bond release. Removal would not be any sooner than 2 years after the last augmented seeding. Upon pond removal, the area will be regraded and reseeded according to the reclamation plan. Plate 7-7 provides reclamation contours and drainage plans.

Discharge Structures

The sedimentation pond will be used until the end of Phase II bond release. The pond will be removed along with the discharge structures and a major portion of the 60-inch culvert in the south fork of Coleman Wash that diverts undisturbed runoff under the sedimentation pond. The culvert will be separated (cut) on the downstream side of the spillway structures (reference Plate 7-6) and the upper portion removed.

Impoundments

No impoundments will be left on site after Phase II bond release.

Casing and Sealing of Wells

There are three monitoring wells and one water-supply well in or adjacent to the permit area. When these wells are no longer required, they will be sealed in a safe, environmentally sound manner in accordance with regulations (Sections 631.200, 722.400, and 765).

Findings:

The Permittee has met the minimum hydrologic information reclamation requirements of the regulations.

CONTEMPORANEOUS RECLAMATION

Regulatory Reference: 30 CFR Sec. 785.18, 817.100; R645-301-352, -301-553, -302-280, -302-281, -302-282, -302-283, -302-284.

Minimum Regulatory Requirements:

General

Reclamation efforts, including but not limited to backfilling, grading, topsoil replacement, and revegetation, on all areas affected by surface impacts incident to an underground coal mine shall occur as contemporaneously as practicable with mining operations, except when such mining operations are conducted in accordance with a variance for concurrent surface and underground mining activities issued under Section 785.18 of this Chapter. The Division may establish schedules that define contemporaneous reclamation.

Variations for delay in contemporaneous reclamation requirement in combined surface and underground mining activities

This section shall apply to any person or persons conducting or intending to conduct combined surface and underground mining activities where a variance is requested from the contemporaneous reclamation requirements. Any person desiring a variance under this section shall file with the Division, complete applications for both the surface mining activities and underground mining activities which are to be combined. The reclamation and operation plans for these permits shall contain appropriate narratives, maps, and plans, which: show why the proposed underground mining activities are necessary or desirable to assure maximum practical recovery of the coal; show how multiple future disturbances of surface lands or waters will be avoided; identify the specific surface areas for which a variance is sought and the Sections of the Act, this Chapter, and the regulatory program from which a variance is being sought; show how the activities will comply with the requirements for protection of underground mining and other applicable requirements of the regulatory program; show why the variance sought is necessary for the implementation of the proposed underground mining activities; provide an assessment of the adverse environmental consequences and damages, if any, that will result if the reclamation of surface mining activities is delayed; and, show how offsite storage of spoil will be conducted to comply with the requirements of the Act, and the regulatory program.

A permit incorporating a variance under this section may be issued by the Division if it first finds, in writing, upon the basis of a complete application filed in accordance with this section, that: the applicant has presented, as part of the permit application, specific, feasible plans for the proposed underground mining activities; the proposed underground mining activities are necessary or desirable to assure maximum practical recovery of the mineral resource and will avoid multiple future disturbances of surface land or waters; the applicant has satisfactorily demonstrated that the applications for the surface mining activities and underground mining activities conform to the requirements of the regulatory program and that all other permits necessary for the underground mining activities have been issued by the appropriate authority; the surface area of surface mining activities proposed for the variance has been shown by the applicant to be necessary for implementing the proposed underground mining activities; no substantial adverse environmental damage, either onsite or offsite, will result from the delay in completion of reclamation otherwise required; the operations will, insofar as a variance is authorized, be conducted in compliance with the requirements of the regulatory program; comply with the provisions for offsite storage of spoil; liability under the performance bond required will be for the duration of the underground mining activities and until all requirements have been complied with; and, the permit for the surface mining activities contains specific conditions delineating the particular surface areas for which a variance is authorized, identifying the applicable regulatory provisions, and, providing a detailed schedule for compliance with the provisions of this section. Variances granted by permits issued under this section shall be reviewed by the Division no later than 3 years from the dates of issuance of the permit and any permit renewals.

Analysis:

Reclamation efforts, including but not limited to backfilling, grading, topsoil replacement, and revegetation, on all areas affected by surface impacts incident to an underground coal mine shall occur as contemporaneously as practicable with mining operations, except when such mining operations are conducted in accordance with a variance for concurrent surface and underground mining activities issued

RECLAMATION PLAN

under Section 785.18 of this Chapter. The Division may establish schedules that define contemporaneous reclamation.

Because this is an underground operation, a schedule specifically for contemporaneous reclamation is not required. The application does contain a reclamation schedule in Table 3-3 in Chapter 3. The Permittee is not proposing surface mining, so the variance for combined surface and underground operations does not apply.

Findings:

Information in the application is adequate to meet the contemporaneous reclamation requirements of the regulations.

REVEGETATION

Regulatory Reference: 30 CFR Sec. 785.18, 817.111, 817.113, 817.114, 817.116; R645-301-244, -301-353, -301-354, -301-355, -301-356, -302-280, -302-281, -302-282, -302-283, -302-284.

Minimum Regulatory Requirements:

Revegetation: General requirements

The permittee shall establish on regraded areas and on all other disturbed areas except water areas and surface areas of roads that are approved as part of the postmining land use, a vegetative cover that is in accordance with the approved permit and reclamation plan and that is: diverse, effective, and permanent; comprised of species native to the area, or of introduced species where desirable and necessary to achieve the approved postmining land use and approved by the Division; at least equal in extent of cover to the natural vegetation of the area; and, capable of stabilizing the soil surface from erosion.

The reestablished plant species shall: be compatible with the approved postmining land use; have the same seasonal characteristics of growth as the original vegetation; be capable of self-regeneration and plant succession; be compatible with the plant and animal species of the area; and, meet the requirements of applicable State and Federal seed, poisonous and noxious plant, and introduced species laws or regulations.

The Division may grant exception to these requirements when the species are necessary to achieve a quick-growing, temporary, stabilizing cover, and measures to establish permanent vegetation are included in the approved permit and reclamation plan.

When the Division approves a cropland postmining land use, the Division may grant exceptions to the requirements related to the original and native species of the area. Areas identified as prime farmlands must also meet those specific requirements as specified under that section.

Revegetation: Timing

Disturbed areas shall be planted during the first normal period for favorable planting conditions after replacement of the plant-growth medium. The normal period for favorable planting is that planting time generally accepted locally for the type of plant materials selected.

Revegetation: Mulching and other soil stabilizing practices

Suitable mulch and other soil stabilizing practices shall be used on all areas that have been regraded and covered by topsoil or topsoil substitutes. The Division may waive this requirement if seasonal, soil, or slope factors result in a condition where mulch and other soil stabilizing practices are not necessary to control erosion and to promptly establish an effective vegetative cover.

Revegetation: Standards for success

Success of revegetation shall be judged on the effectiveness of the vegetation for the approved postmining land use, the extent of cover compared to the cover occurring in natural vegetation of the area, and the general requirements for Revegetation. Standards for success and statistically valid sampling techniques for measuring success shall be selected by the Division and included in an approved regulatory program.

Standards for success shall include criteria representative of unmined lands in the area being reclaimed to evaluate the appropriate vegetation parameters of ground cover, production, or stocking. Ground cover, production, or stocking shall be considered equal to the approved success standard when it is not less than 90 percent of the success standard. The sampling techniques for measuring success shall use a 90-percent statistical confidence interval (i.e., a one-sided test with a 0.10 alpha error).

Standards for success shall be applied in accordance with the approved postmining land use and, at a minimum, the following conditions:

- 1.) For areas developed for use as grazing land or pasture land, the ground cover and production of living plants on the revegetated area shall be at least equal to that of a reference area or such other success standards approved by the Division.

RECLAMATION PLAN

2.) For areas developed for use as cropland, crop production on the revegetated area shall be at least equal to that of a reference area or such other success standards approved by the Division.

3.) For areas to be developed for fish and wildlife habitat, recreation, shelter belts, or forest products, success of vegetation shall be determined on the basis of tree and shrub stocking and vegetative ground cover. Such parameters are described as follows: minimum stocking and planting arrangements shall be specified by the Division on the basis of local and regional conditions and after consultation with and approval by the State agencies responsible for the administration of forestry and wildlife programs. Consultation and approval may occur on either a programwide or a permit-specific basis; trees and shrubs that will be used in determining the success of stocking and the adequacy of the plant arrangement shall have utility for the approved postmining land use. Trees and shrubs counted in determining such success shall be healthy and have been in place for not less than two growing seasons. At the time of bond release, at least 80 percent of the trees and shrubs used to determine such success shall have been in place for 60 percent of the applicable minimum period of responsibility; and, vegetative ground cover shall not be less than that required to achieve the approved postmining land use.

For areas to be developed for industrial, commercial, or residential use less than 2 years after regrading is completed, the vegetative ground cover shall not be less than that required to control erosion.

For areas previously disturbed by mining that were not reclaimed to the requirements of the performance standards and that are remined or otherwise redisturbed by surface coal mining operations, as a minimum, the vegetative ground cover shall be not less than the ground cover existing before redisturbance and shall be adequate to control erosion.

The period of extended responsibility for successful revegetation shall begin after the last year of augmented seeding, fertilizing, irrigation, or other work, excluding husbandry practices that are approved by the Division.

In areas of more than 26.0 inches of annual average precipitation, the period of responsibility shall continue for a period of not less than five full years. Vegetation parameters identified for grazing land or pasture land and cropland shall equal or exceed the approved success standard during the growing seasons of any two years of the responsibility period, except the first year. Areas approved for the other uses shall equal or exceed the applicable success standard during the growing season of the last year of the responsibility period.

In areas of 26.0 inches or less average annual precipitation, the period of responsibility shall continue for a period of not less than 10 full years. Vegetation parameters shall equal or exceed the approved success standard for at least the last 2 consecutive years of the responsibility period.

The Division may approve selective husbandry practices, excluding augmented seeding, fertilization, or irrigation, provided it obtains prior approval from the Director as a State Program Amendment that the practices are normal husbandry practices, without extending the period of responsibility for revegetation success and bond liability, if such practices can be expected to continue as part of the postmining land use or if discontinuance of the practices after the liability period expires will not reduce the probability of permanent revegetation success. Approved practices shall be normal husbandry practices within the region for unmined lands having land uses similar to the approved postmining land use of the disturbed area, including such practices as disease, pest, and vermin control; and any pruning, reseeding, and transplanting specifically necessitated by such actions.

Analysis:**Revegetation Plan**

Table 3-3 in Chapter 3 is a general reclamation timetable. According to this timetable, seeding and mulching would begin about the first of October, depending on the weather, and seedlings would be planted about the first of November.

Blue grama and galleta are two of the dominant grasses in the area proposed to be disturbed, and they are both warm season grasses. Other mines in Utah have found it difficult to establish these species on reclaimed sites, and this may be because they are often seeded in the fall. Mines in New Mexico and Arizona usually seed these species in the summer to take advantage of late summer rains, but, to the Division's knowledge, no Utah mines have attempted to establish these species by planting them in the summer.

The Permittee has committed to establish test plots to test whether summer seeding will increase establishment of the warm season species. With this commitment, the Division is willing to accept the

plan to seed in the fall. Further details of the test plot plan are discussed in the "Field Trials" section of this analysis.

Following demolition, the area would be regraded to approximate original contour. These areas will then be ripped 16-18 inches deep and disced. Topsoil will then be distributed to depths from six to eighteen inches as discussed in Chapter 2.

Following topsoil redistribution, the soil will be tilled until large clods on the surface are diminishing. Tilling the soil to reduce the number and size of clods has not been necessary at other Utah mines because clods are broken up as the soil is redistributed, but a limited amount of tilling would not be detrimental. Gouging or pocking (see below) would also serve to break up large clods.

According to Section 553.230, surface preparation will include pock marking to minimize the potential for erosion and to enhance vegetation establishment. Because of the limited precipitation, the Division considers surface roughening to be essential at this site. Diagrams of pock mark configurations are shown in Figure 1 in Appendix 5-8.

Appendix 5-8 says that in conjunction with pock marking, the track hoe can cast any vegetation, dead trees, and large rocks back onto the reclaimed surface. This debris provides solar protection but also increases available moisture in small areas and increases topographic and vegetation diversity.

The application provides for adequate rooting depth which is vital for plants in an arid environment. Studies of plant phenology have clearly shown plants in arid areas use soil water from increasing depths as the growing season continues, and if there is inadequate rooting depth, production and vegetative cover will decrease.

The seed mixture for final reclamation is shown in Table 3.4/3.5. It consists of 22 species, 19 of which are native to the area. The introduced species are yellow sweet clover, alfalfa, and forage kochia, and the application discusses the reasons for using these species. Based on the reasons in the plan and as discussed below, the Division can allow using these three species.

There is controversy about whether yellow sweet clover should be included in seed mixes for revegetation, but the Permittee would apply it at a rate of only 0.5 pounds per acre. At this rate, it should not dominate the site or spread to adjacent areas. The plan says yellow sweet clover has proven beneficial in rapid establishment on marginal sites and that, as a legume, it should be able to fix nitrogen. The plan includes a commitment to use inoculated seed.

Alfalfa was recommended by the UDWR, and because this site is marginal for alfalfa, it should not be overly aggressive. Forage kochia is desirable as a browse species, and there is evidence it competes well with downy brome, a weed that dominates much of the proposed disturbed area.

RECLAMATION PLAN

The seeding rate shown in Table 3.4/3.5 is about 125 seeds per square foot. This is a little higher than the rate recommended by the *Interagency Forage and Conservation Planting Guide for Utah*¹¹ but is acceptable.

Appendix 5-8 says that if seeding does not result in shrub densities exceeding the success standard, bare root or containerized seedlings may be planted at a rate of approximately 200 per acre. The ratio and species would be determined by the BLM and the UDWR. The plan gives adequate details of when and how seedlings would be planted. If the Permittee plants any seedlings, the species and rates would need to be approved by the Division and then included in the plan. The discussion in the application is for a conceptual plan, and although the Division approves the concept as written, details would need to be approved before being implemented.

Section 341.220 says seed will be broadcast with a hydroseeder. Fertilizer will be broadcast, but the application does not give a specific application method. Fertilizer should not be included with seed during hydroseeding operations. The site will be mulched with 2000 pounds per acre of wood fiber mulch with 100 pounds per acre of a tackifier. Appendix 5-8 provides additional detail and says 500 pounds per acre of wood fiber mulch and 100 pounds per acre of tackifier will be applied with the seed followed by application of an additional 1500 to 2000 pounds per acre of mulch and 100 pounds of tackifier.

Water harvesting methods (gouging) will be used, and there will be no irrigation. No pest or disease control measures are planned, and no serious pest control problems have been reported for the area.

Section 357.301 says the Lila Canyon Mine would like to reserve the right to apply for augmentation of reclaimed areas thus "extending the bond liability period on a site specific case scenario." This statement is acceptable but unnecessary. The regulations in R645-301-357 are designed to allow a limited amount of reseeded and other work for specific purposes without lengthening the extended liability period.

Success Standards

The reference area for the mine site disturbance was established adjacent to the proposed facilities during the summer of 1999. Its location is shown on Figure 1 in Appendix 3-2.

The grass/shrub reference area is similar in most respects to the proposed disturbed grass/shrub areas, and it is considered an acceptable success standard for comparison to revegetated areas. The Division recommends the reference area be checked every five years to help ensure it is in fair or better condition and thus remains a viable reference area.

The Permittee is proposing to use the grass/shrub reference area as a success standard for the pinyon/juniper community. The pinyon/juniper area has statistically less vegetation cover than the reference area, so this may be a difficult standard to meet. However, reclaiming to a grass/shrub community would enhance the amount of forage available for both wildlife and grazing. A pinyon/juniper

¹¹Utah State University Agricultural Experiment Station and Cooperative Extension Service. 1989. *Interagency forage and conservation planting guide for Utah*. Howard Horton (ed.). EC 433. Logan, Utah. 66 pp.

community would generally provide more cover for some wildlife species, but forage tends to be more limiting in this area than cover. Therefore, the Division considers this proposal to be acceptable.

The Division is required in R645-301-356.230 to consult with the UDWR and gain approval for the tree and shrub density standard for success. The standard set in consultation with UDWR is 1500 per acre, and this standard has been included in the plan. The standard was based more on the species expected to become established in the area than on the existing vegetation.

Section 341.250 discusses success standards for diversity, seasonality, and erosion control. To judge diversity, every species with more than 20 percent frequency would be classified into a life form. The standard is that the reclaimed area must have at least as many species in each life form, except introduced and undesirable species, as the reference area. The reclaimed and reference areas would not need to have exactly the same species. Life form categories would be native grass, native broadleaf forb, native shrub, desirable introduced, and undesirable species. Undesirable species are those generally classified as weeds or that are poisonous to livestock or wildlife. The basic method used to judge diversity will be used to assess seasonality except that the life form categories would simply be warm and cool season. This is a relatively easy standard to measure and is acceptable.

Although the numbers may be different when reference area vegetation is measured for bond release, the diversity standard according to information gathered in 1999 would be two shrub species, one broadleaf forb, and six grasses. In addition, two undesirable species were encountered with greater than 20 percent frequency. There were three warm season species, five cool season, and one species (purple three-awn) about which no information on seasonality was found.

The proposed erosion standard is that vegetation will have demonstrated its erosion control effectiveness when UPDES effluent standards are met. All drainages leading away from the permit area would be sampled as often as practical. In addition the Permittee commits in Section 244.300 to repair all rills and gullies which form in areas that have been regraded and topsoiled and which either disrupt the approved postmining land use or the reestablishment of vegetative cover. The rills and gullies will be filled, regraded, or otherwise stabilized. Topsoil will be replaced, and the areas will be reseeded or planted (R645-301-244.300). The repair and/or treatment of rills and gullies which result from a deficient surface water control or grading plan, as defined by the recurrence of rills and gullies, will be considered an augmentative practice and will thus restart the extended responsibility period (R645-301-357.364).

Field Trials

The plan says the methods outlined have a proven performance based on the successful reclamation of the Horse Canyon Mine. Section 354 discusses timing of seeding for blue grama and galleta. The Permittee will use these species in the interim seed mix adjacent to the sediment pond. The west half of the pond disturbance will be seeded in mid-summer following construction. The east half will be seeded in the late fall. The line separating these two areas will be staked, and ocular estimates of reclamation success will be taken each fall for three years. If there appears to be a difference in the two areas, quantitative samples will be taken. If it is possible to derive a conclusion about timing of seeding, the timing of seeding, fall versus summer, will be modified accordingly at the time of permit renewal.

RECLAMATION PLAN**Findings:**

Information provided in the plan is adequate to meet the revegetation requirements of the regulations. Using the techniques described in the application, the Division considers that revegetation is feasible at this site.

STABILIZATION OF SURFACE AREAS

Regulatory Reference: 30 CFR Sec. 817.95; R645-301-244.

Minimum Regulatory Requirements:

All exposed surface areas shall be protected and stabilized to effectively control erosion and air pollution attendant to erosion. Rills and gullies which form in areas that have been regraded and topsoiled and which either disrupt the approved postmining land use or the reestablishment of the vegetative cover, or, cause or contribute to a violation of water quality standards for receiving streams, shall be filled, regraded, or otherwise stabilized; topsoil shall be replaced; and the areas shall be reseeded or replanted.

Analysis:

Vegetation will be the primary method for controlling erosion and fugitive dust (Section 244.100). Other measures that will help in erosion control and soil stabilization are pocking and rock placement. Pocking is illustrated in Figure 1 in Appendix 5-8. In addition, wood fiber mulch will be applied at a rate of 2,000 pounds per acre to the reclaimed areas that have been graded and covered by topsoil or substitute topsoil.

Section 341.220 indicates that 2000 pounds per acre of wood fiber mulch with 100 pounds per acre of a tackifier will be used to mulch the site. Appendix 5-8 provides additional detail and says 500 pounds per acre of wood fiber mulch and 100 pounds per acre of tackifier will be applied with the seed followed by application of an additional 1500 to 2000 pounds per acre of mulch and 100 pounds of tackifier. Section 357.365 says that "areas in excess of 3:1 slopes will receive additional mulch and tackifier to facilitate vegetation establishment."

Rills and gullies in excess of eight inches width and/or depth will be repaired on a seasonal basis (Section 357.360). In addition, Section 244.300 states a commitment to stabilize rills and gullies which form in areas that have been regraded and topsoiled and which either disrupt the approved postmining land use or the reestablishment of vegetative cover, and which cause or contribute to a violation of water quality standards for receiving streams, will be filled, regraded, or otherwise stabilized, re-topsoiled and re-seeded.

Findings:

The Permittee has met the minimum surface stabilization requirements of the Regulations.

CESSATION OF OPERATIONS

Regulatory Reference: 30 CFR Sec. 817.131, 817.132; R645-301-515, -301-541.

Minimum Regulatory Requirements:

Each person who conducts mining activities shall effectively support and maintain all surface access openings to underground operations, and secure surface facilities in areas in which there are no current operations, but operations are to be resumed under an approved permit. Temporary abandonment shall not relieve a person of his or her obligation to comply with any provisions of the approved permit.

Before temporary cessation of mining and reclamation operations for a period of 30 days or more, or as soon as it is known that a temporary cessation will extend beyond 30 days, each person who conducts underground mining activities shall submit to the Division a notice of intention to cease or abandon operations. This notice shall include a statement of the exact number of surface acres and the horizontal and vertical extent of subsurface strata which have been in the permit area prior to cessation or abandonment, the extent and kind of surface area reclamation which will have been accomplished, and identification of the backfilling, regrading, revegetation, environmental monitoring, underground opening closures, and water-treatment activities that will continue during the temporary cessation.

The person who conducts underground mining activities shall close or backfill or otherwise permanently reclaim all affected areas, in accordance with this Chapter and according to the permit approved by the Division.

All surface equipment, structures, or other facilities not required for continued underground mining activities and monitoring, unless approved as suitable for the postmining land use or environmental monitoring, shall be removed and the affected lands reclaimed.

Analysis:

The Permittee committed to comply with R645-301-515 and R645-301-541 for temporary and permanent cessation. If there is temporary cessation that will last more than 30 days, the Permittee will notify the Division. After permanent cessation, the Permittee committed to remove all equipment and surface structures.

Findings:

The Permittee met the minimum requirements for cessation of operations.

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-323, -301-512, -301-521, -301-542, -301-632, -301-731.

Minimum Regulatory Requirements:

Each application shall contain maps, plans, and cross sections which show the reclamation activities to be conducted, the lands to be affected throughout the operation, and any change in a facility or feature to be caused by the proposed operations, if the facility or feature was shown and described as an existing structure.

The permit application must include as part of the reclamation plan information, the following maps, plans and cross sections:

Affected area boundary maps

The boundaries of all areas proposed to be affected over the estimated total life of all mining activities and reclamation activities, with a description of size, sequence, and timing of phased reclamation activities and treatments. All maps and cross sections used for reclamation design purposes shall clearly show the affected and permit area boundaries in reference to the reclamation work being accomplished.

Bonded area map

The permittee shall identify the initial and successive areas or increments for bonding on the permit application map and shall specify the bond amount to be provided for each area or increment. The bond or bonds shall cover the entire permit area, or an identified increment of land within the permit area upon which the operator will initiate and conduct surface coal mining and reclamation operations during the initial term of the permit. As surface coal mining and reclamation operations on succeeding increments are initiated and conducted within the permit

RECLAMATION PLAN

area, the permittee shall file with the Division an additional bond or bonds to cover such increments. Independent increments shall be of sufficient size and configuration to provide for efficient reclamation operations should reclamation by the Division become necessary.

Reclamation backfilling and grading maps

Contour maps and cross sections to adequately show detail and design for backfilling and grading operations during reclamation. Where possible, cross sections shall include profiles of the pre-mining, operations, and post-reclamation topography. Contour maps shall be at a suitable scale and contour interval so as to adequately detail the final surface configuration. When used in the formulation of mass balance calculations, cross sections shall be at adequate scale and intervals to support the mass balance calculations. Mass balance calculations derived from contour information must demonstrate that map scale and contour accuracy are adequate to support the methods used in such earthwork calculations. Detailed cross sections shall be provided when required to accurately depict reclamation designs which include, but are not limited to: terracing and benching, retained roads, highwall remnants, slopes requiring geotechnical analysis, and embankments of permanent impoundments.

Reclamation facilities maps

Location of each facility that will remain on the proposed permit area as a permanent feature, after the completion of underground mining activities. Location and final disposition of each sedimentation pond, permanent water impoundment, coal processing waste bank, and coal processing water dam and embankment, disposal areas for underground development waste and excess spoil, and water treatment and air pollution control facilities within the proposed permit area to be used in conjunction with phased reclamation activities or to remain as part of reclamation.

Final surface configuration maps

Sufficient slope measurements to adequately delineate the final surface configuration of the area affected by surface operations and facilities, measured and recorded according to the following: each measurement shall consist of an angle of inclination along the prevailing slope extending 100 linear feet above and below or beyond the coal outcrop or the area disturbed or, where this is impractical, at locations specified by the Division; where the area has been previously mined, the measurements shall extend at least 100 feet beyond the limits of mining disturbances, or any other distance determined by the Division to be representative of the post-reclamation configuration of the land; and, slope measurements shall take into account variations in slope, to provide accurate representation of the range of slopes and reflect geomorphic differences of the area disturbed through reclamation activities.

Reclamation monitoring and sampling location maps

Elevations and locations of test borings and core samplings. Elevations and locations of monitoring stations used to gather data on water quality and quantity, subsidence, fish and wildlife, and air quality, if required, to demonstrate reclamation success.

Reclamation surface and subsurface manmade features maps

The location of all buildings in and within 1,000 feet of the proposed permit area, with identification of the current or proposed use of the buildings at the time of final reclamation. The location of surface and subsurface manmade features within, passing through, or passing over the proposed permit area, including, but not limited to, major electric transmission lines, pipelines, fences, and agricultural drainage tile fields. Each public road located in or within 100 feet of the proposed permit area and all roads within the permit area which are to be left as part of the post-mining land use. Buildings, utility corridors, and facilities to be used in conjunction with reclamation or to remain for final reclamation.

Reclamation treatments maps

The location and boundaries of any proposed areas for reclamation treatments including but not limited to: location, extent and depth of materials used for resoiling; location, extent and types of treatments for revegetation including soil preparation, soil amendments, mulching, seeding, variations in seed mixtures, and other revegetation treatments. Each water diversion, collection, conveyance, treatment, storage and discharge facility to be used during reclamation. *Each facility to be used to protect and enhance fish and wildlife related environmental values.* other treatments or applications which are specifically designed or required as part of phased or final reclamation activity.

Certification Requirements.

Cross sections, maps, and plans required to show the design, location, elevation, or horizontal or vertical extent of the land surface or of a structure or facility used to conduct mining and reclamation operations shall be prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, a professional geologist, or in any State which authorizes land surveyors to prepare and certify such cross sections, maps, and plans, a qualified, registered, professional land surveyor, with assistance from experts in related fields such as landscape architecture.

Each detailed design plan for an impounding structure that meets or exceeds the size or other criteria of the Mine Safety and Health Administration, 30 CFR Section 77.216(a) shall: be prepared by, or under the direction of, and certified by a qualified registered professional engineer with assistance from experts in related fields such as geology, land surveying, and landscape architecture; include any geotechnical investigation, design, and construction requirements for the structure; describe the operation and maintenance requirements for each structure; and, describe the timetable and plans to remove each structure, if appropriate.

Each detailed design plan for an impounding structure that does not meet the size or other criteria of 30 CFR Section 77.216(a) shall: be prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, or in any State which authorizes land

surveyors to prepare and certify such plans, a qualified, registered, professional land surveyor, except that all coal processing waste dams and embankments shall be certified by a qualified, registered, professional engineer; include any design and construction requirements for the structure, including any required geotechnical information; describe the operation and maintenance requirements for each structure; and, describe the timetable and plans to remove each structure, if appropriate.

Analysis:

Affected Area Boundary Maps

Plate 5-4 shows the boundaries of all lands that are expected to be affected by the Lila Canyon Mine. Plates 5-6, 5-7A and 5-7B show the reclamation topography and cross sections.

Bonded Area Map

Plate 1-1 shows the permit areas A and B(Horse Canyon Mine and Lila Canyon Mine) for which a reclamation bond will be posted.

Reclamation Backfilling and Grading Maps

Plates 5-6, 5-7A, and 5-7B show the reclamation contours and cross sections. The maps and cross section were adequate for the following purposes:

- To determine mass balance calculations.
- To show that all terraces, benches, roads, highwalls will be removed or fully reclaimed.
- For slope stability analysis (See Appendix 5-5) for reclaimed slopes. Note: no impoundments will be left after reclamation.

Reclamation Facilities Maps

The Permittee will not leave any facilities after final reclamation. Therefore, such a map is not needed.

Final Surface Configuration Maps

Plate 5-6 and Plate 5-7 show the proposed final surface topography. The maps and cross sections show the slopes extending 100 linear feet beyond the disturbed permit boundaries. The Division found that those maps and cross sections are sufficient to show the geomorphic differences of the disturbed and undisturbed areas.

Reclamation Surface and Subsurface Manmade Features Maps

The Permittee states that no manmade features in the reclaimed area remain, other than the 60 inch culvert section that will under lie the county road in the south fork of Coleman Wash.

RECLAMATION PLAN

Certification Requirements

All cross sections, maps and plans required by R645-301-512 have been certified by a registered professional engineer.

Findings:

The Permittee has met the minimum requirements for maps, plans and **cross-sections** of reclamation operations.

BONDING AND INSURANCE REQUIREMENTS

Regulatory Reference: 30 CFR Sec. 800; R645-301-800, et seq.

Minimum Regulatory Requirements:**General**

After a permit application has been approved, but before a permit is issued, the applicant shall file with the Division, on a form prescribed and furnished by the Division, a bond or bonds for performance made payable to the Division and conditioned upon the faithful performance of all the requirements of the Act, the regulatory program, the permit, and the reclamation plan.

The bond or bonds shall cover the entire permit area, or an identified increment of land within the permit area upon which the operator will initiate and conduct surface coal mining and reclamation operations during the initial term of the permit. As surface coal mining and reclamation operations on succeeding increments are initiated and conducted within the permit area, the permittee shall file with the Division an additional bond or bonds to cover such increments.

The operator shall identify the initial and successive areas or increments for bonding on the permit application map and shall specify the bond amount to be provided for each area or increment. Independent increments shall be of sufficient size and configuration to provide for efficient reclamation operations should reclamation by the Division become necessary.

An operator shall not disturb any surface areas, succeeding increments, or extend any underground shafts, tunnels, or operations prior to acceptance by the Division of the required performance bond.

The applicant shall file, with the approval of the Division, a bond or bonds under one of the following schemes to cover the bond amounts for the permit area as determined: a performance bond or bonds for the entire permit area; a cumulative bond schedule and the performance bond required for full reclamation of the initial area to be disturbed; or, an incremental-bond schedule and the performance bond required for the first increment in the schedule.

Form of bond

The Division shall prescribe the form of the performance bond. The Division may allow for: a surety bond; a collateral bond; a self-bond; or a combination of any of these bonding methods.

Performance bond liability shall be for the duration of the surface coal mining and reclamation operation and for a period which is coincident with the operator's period of extended responsibility for successful revegetation or until achievement of the reclamation requirements of the Act, regulatory programs, and permit, whichever is later.

With the approval of the Division, a bond may be posted and approved to guarantee specific phases of reclamation within the permit area provided the sum of phase bonds posted equals or exceeds the total amount required. The scope of work to be guaranteed and the liability assumed under each phase bond shall be specified in detail.

Isolated and clearly defined portions of the permit area requiring extended liability may be separated from the original area and bonded separately with the approval of the Division. Such areas shall be limited in extent and not constitute a scattered, intermittent, or checkerboard pattern of failure. Access to the separated areas for remedial work may be included in the area under extended liability if deemed necessary by the Division.

The bond liability of the permittee shall include only those actions which he or she is obligated to take under the permit, including completion of the reclamation plan, so that the land will be capable of supporting the postmining land use approved. Implementation of an alternative postmining land use which is beyond the control of the permittee, need not be covered by the bond. Bond liability for prime farmland shall be specific to include productivity requirements.

Determination of bond amount

The amount of the bond required for each bonded area shall: be determined by the Division; depend upon the requirements of the approved permit and reclamation plan; reflect the probable difficulty of reclamation, giving consideration to such factors as topography, geology, hydrology, and revegetation potential; and, be based on, but not limited to, the estimated cost submitted by the permit applicant.

The amount of the bond shall be sufficient to assure the completion of the reclamation plan if the work has to be performed by the Division in the event of forfeiture, and in no case shall the total bond initially posted for the entire area under 1 permit be less than \$10,000.

An operator's financial responsibility for repairing material damage resulting from subsidence may be satisfied by the liability insurance policy required in this section.

Terms and conditions for liability insurance

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

The policy shall be maintained in full force during the life of the permit or any renewal thereof and the liability period necessary to complete all reclamation operations under this Chapter.

The policy shall include a rider requiring that the insurer notify the Division whenever substantive changes are made in the policy including any termination or failure to renew.

The Division may accept from the applicant, in lieu of a certificate for a public liability insurance policy, satisfactory evidence from the applicant that it satisfies applicable State self-insurance requirements approved as part of the regulatory program and the requirements of this section.

Analysis:

Form of Bond (Reclamation Agreement)

The Operator ~~did not~~ submitted two sureties in the proper form in the total amount of \$2,809,000. ~~a bond as part of the application. The Division allows the Operator to submit a bond separately after the Division determined the bond amount, which can be after the TA has been completed. Before the Division issues a permit the application must post a bond, see the requirements of R645-301-820. Upon receipt of the bond, the Division then makes a finding about whether or not the bond is in the proper form; see R645-301-860 for the requirements for the proper form of the bond. The Division cannot issue the permit until an adequate bond has been posted.~~

Determination of Bond Amount

The Division used information in Appendix 8-1, Chapters 3 and 5 to calculate the reclamation cost. The Division determined that the Permittee must post an **additional** bond of \$1,556,000 (2006 dollars) for the Lila Canyon Mine. This sum is in addition to the bond currently posted for the Horse Canyon Mine **\$1,253,000** which was last adjusted on May 21, 2001 (**May 3, 2001**).

Terms and Conditions for Liability Insurance

A copy of the certificate of liability insurance is in Appendix 8-2. The policy is held with Federal Insurance Company and expires on June 1, 2002.

RECLAMATION PLAN

Findings:

The Permittee submitted a surety in the amount of \$1,556,000 additional bond for this project. UEI has posted a total of \$2,809,000 in the form of two acceptable sureties for the Horse Canyon Mine. The public liability insurance is adequate. The Permittee has met the minimum Bonding and Insurance requirements of the regulations. ~~However, the Permittee must post the additional bond prior to the significant revision being formally approved. The Division calculated the reclamation costs for the Lila Canyon Mine to be \$1,556,000 (2006 dollars):~~

Page 170

C/007/013-~~SR98(1)-6~~ RBO

~~July 19, 2001~~ January 9, 2002

RECLAMATION PLAN



SPECIAL CATEGORIES OF MINING

REQUIREMENTS FOR PERMITS FOR SPECIAL CATEGORIES OF MINING

PRIME FARMLAND

Regulatory Reference: 30 CFR Sec. 785.16, 823; R645-301-221, -302-300 et seq.

Minimum Regulatory Requirements:

All permit applications, whether or not prime farmland is present, shall include the results of a reconnaissance inspection of the proposed permit area to indicate whether prime farmland exists. The Division in consultation with the U.S. Soil Conservation Service shall determine the nature and extent of the required reconnaissance inspection.

If the reconnaissance inspection indicates that land within the proposed permit area may be prime farmland historically used for croplands, the applicant shall determine if a soil survey exists for those lands and whether soil mapping units in the permit area have been designated as prime farmland. If no soil survey exists, the applicant shall have a soil survey made of the lands within the permit area which the reconnaissance inspection indicates could be prime farmland. Soil surveys of the detail used by the U.S. Soil Conservation Service for operational conservation planning shall be used to identify and locate prime farmland soils.

If the soil survey indicates that prime farmland soils are present within the proposed permit area, the following shall apply:

Prime Farmland Application contents.

All permit applications for areas in which prime farmland has been identified within the proposed permit area shall include the following:

- 1.) A soil survey of the permit area.
- 2.) A plan for soil reconstruction, replacement, and stabilization
- 3.) Scientific data, such as agricultural-school studies, for areas with comparable soils, climate, and management that demonstrate that the proposed method of reclamation, including the use of soil mixtures or substitutes, if any, will achieve, within a reasonable time, levels of yield equivalent to, or higher than, those of nonmined prime farmland in the surrounding area.
- 4.) The productivity prior to mining, including the average yield of food, fiber, forage, or wood products obtained under a high level of management.

Analysis:

There will be no mining operations conducted in Prime Farmlands during the proposed life of this significant revision.

Findings:

The Permittee has submitted sufficient information for this section.

OPERATIONS IN ALLUVIAL VALLEY FLOORS

Regulatory Reference: 30 CFR Sec. 822; R645-302-324.

Minimum Regulatory Requirements:

This part sets forth additional requirements for surface coal mining and reclamation operations on or which affect alluvial valley floors in the arid and semiarid regions of the country.

Analysis:

There will be no mining operations conducted in Alluvial Valley Floors during the proposed life of this significant revision.

Findings:

The Permittee has submitted sufficient information for this section.

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

Regulatory Reference: 30 CFR Sec. 784.14; R645-301-730.

On December 14, 2001 the Board of Oil, Gas and Mining questioned the existence of supporting analysis of the location of the CHIA boundary at 1700 feet east of the permit area. The following discussion addresses this issue.

Dip of strata can be an important factor in ground-water flow, but there is no geologic or hydrologic evidence that water flows from the Lila side of Patmos Ridge towards Range Creek drainage. The updip exposures of the Colton and North Horn-Flagstaff formations along Little Park Wash are areas of ground-water discharge, not recharge. Examination of water rights and topographic maps indicates ground-water discharge on the Range Creek side of Patmos Ridge is much less than on the Lila side. Furthermore, if the deeper ground-water in the Blackhawk Formation were to flow following the projected dip, it would flow well below the reach of Range Creek that is nearest the Lila Mine, and the thick section of low-permeability strata between the Colton and the Blackhawk Formations would impede hydraulic interaction between that deep ground-water and the surface.

Faults can also be important factors in ground-water flow. Both lateral and vertical flow may be channeled through faults and fractures, but plastic or swelling clays that can seal faults and fractures are abundant. The Sunnyside fault zone is a major north-west striking fault that extends from West Ridge to the Horse Canyon Mine. Extension of the Sunnyside fault east of the Lila Canyon Extension is uncertain. Other faults that strike east-west are found in the area of the Horse Canyon Mine and the Lila Canyon Extension. These faults have vertical offsets of 15 to more than 275 feet. They have not been mapped as extending east of Patmos Ridge indicating either formation before deposition of the Colton Formation, decrease in offset from deeper to shallower strata, decreasing offset to the east, or any combination.

Ground-water flow into the Horse Canyon Mine was neither excessive nor sustained. Mine records indicate that the mine was essentially dry until the Sunnyside fault was intercepted. The Lila Canyon Extension plans to avoid the Sunnyside fault. In general, unless a major fault is encountered, inflows of ground-water into mines in the Book Cliffs Coal Field are small and decrease rapidly, indicating perched, isolated sources.

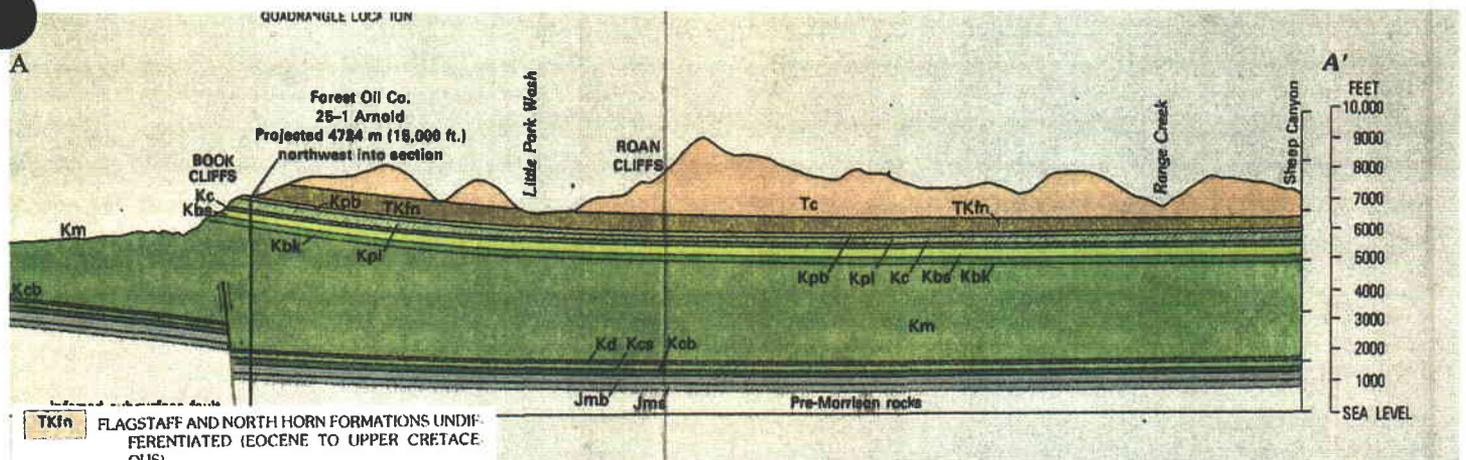
The CIA boundary follows Patmos Ridge, which is as close as 1600 feet to the Lila permit boundary at one point, and as close as 5000 feet to projected mine workings. In the absence of contravening information or data, it is acceptable to infer a ground water divide in the shallow ground-water system that is coincident with a topographic feature such as Patmos Ridge. As discussed above, dip of the strata in this area is not a major influence on ground-water flow in the shallow, perched aquifers, and there is no evidence that any force other than gravity provides the gradient to drive ground-water flow in this region. If there is a separate ground-water divide for the deeper saturated zones, it is most likely east of Range Creek and ground-water flow in this system would be west toward the Book Cliffs rather than to the east away from them, and would flow deep under the perched, local systems that sustain the springs in Little Park Wash (see Figure 1 attached).

The Division evaluated the potential for impacts and has determined that mining will not impact Range

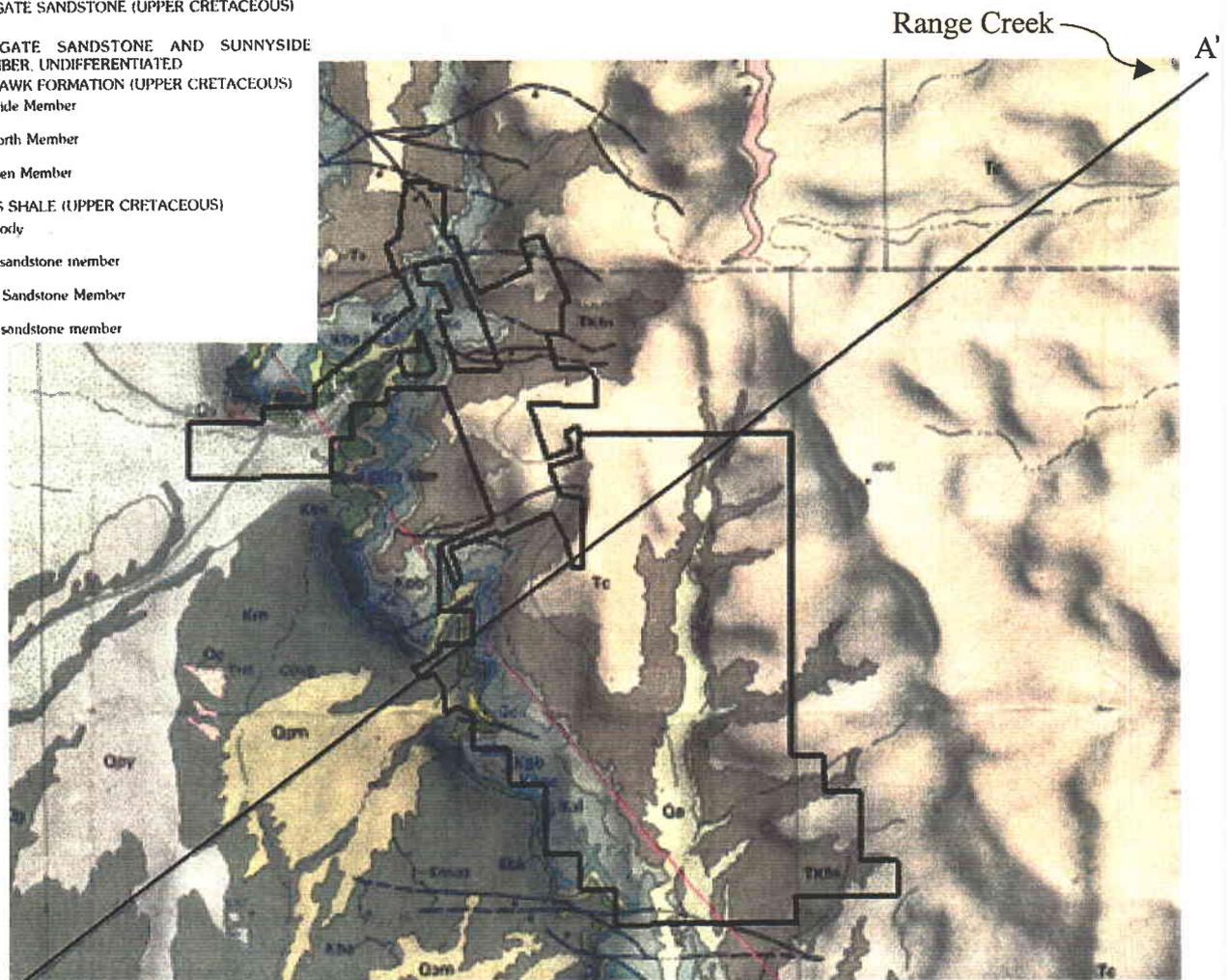
Creek in any way. Aquifers in the Colton Formation and undifferentiated North Horn- Flagstaff formations will not be impacted because the amount of strata between these aquifers and the coal seam, the aquitard characteristics of these strata and the capacity of these strata to seal fractures and faults will restrict vertical movement of water. Also, the undifferentiated North Horn-Flagstaff formations and Mesa Verde Group have low hydraulic conductivity and will prevent the vertical movement of water from the deep zone upward to Range Creek. Groundwater would have to travel a great distance through very low permeability rock to reach Range Creek as shown in Figure 1 (attached).

The Division has provided an assessment of the probable cumulative hydrologic impacts (CHIA) of the proposed operation, and all anticipated mining, upon surface- and ground-water systems in the cumulative impact area. The CHIA is sufficient to determine, for purposes of permit approval, whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area. The Division used data and analyses from several sources, including those submitted by the Permittee in the Lila Canyon Significant Revision.

Figure 1. Figure 1. Illustration of coal zone, Sunnyside member (Kbs), and undifferentiated Flagstaff Limestone and North Horn Formation (TKfn) aquatard which separates the coal zone from Range Creek.



- TKfn** FLAGSTAFF AND NORTH HORN FORMATIONS UNDIFFERENTIATED (EOCENE TO UPPER CRETACEOUS)
- Kpb** PRICE RIVER FORMATION (UPPER CRETACEOUS)
Bluecastle Sandstone Member
- Kpl** Mudstone member
- Kc** CASTLEGATE SANDSTONE (UPPER CRETACEOUS)
- Kbsc** CASTLEGATE SANDSTONE AND SUNNYSIDE MEMBER, UNDIFFERENTIATED
- Kbs** BLACKHAWK FORMATION (UPPER CRETACEOUS)
Sunnyside Member
- Kbk** Kenilworth Member
- Kua** Aberdeen Member
- Km** MANCOS SHALE (UPPER CRETACEOUS)
Main body
- Kmus** Upper sandstone member
- Kmf** Ferron Sandstone Member
- Kmls** Lower sandstone member



Extracted from: Osterwald, F. W., Maberry, J. O., Dunrud, R., 1981, Bedrock, Surficial, and Economic Geology of the Sunnyside Coal-Mining District, Carbon and Emery Counties, Utah, USGS Professional Paper 116, 68 p.



T-Pot as K-T-Alk	T-Hardness	TDS @ 16.1	T-Aluminum	T-Arsenic	T-Barium	T-Boron	T-Cadmium	T-Calcium	T-Chromium	T-Copper	T-Iron	T-Lead	T-Magnesium	T-Mn	T-Mercury	T-Molybde	T-Nickel	
mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	ug/L	mg/L	mg/L	
3.1	640	426	934	<0.02	<0.02	0.09	0.3	<0.005	59.2	<0.005	<0.01	<0.04	<0.01	71.3	<0.01	0.0003	0.02	<0.01
2.9	523	336	790	<0.1	<0.04	0.09	0.25	<0.01	49.4	<0.01	<0.01	<0.076	<0.02	55.4	<0.01	<0.0002	<0.04	<0.01
2.2	463	356	777	0.19	<0.04	0.06	0.24	<0.01	45.8	<0.01	<0.01	<0.073	0.034	54.5	0.017	<0.0002	<0.04	<0.01
0.7	497	374	548	0.08	<0.02	0.09	<0.01	<0.005	57.8	<0.005	<0.1	0.09	<0.01	52.5	0.01	<2	0.01	<0.01
0.59	535	411	659	0.335	<0.04	0.104	0.078	<0.005	64.1	<0.005	<0.1	0.465	0.026	56.9	0.032	<2	<0.01	0.013
<0.1	470	328	534	<0.1	<0.04	0.103	0.097	<0.01	59.7	<0.01	<0.1	0.067	<0.02	52.4	0.52	<2	<0.04	<0.01
1.88	561	405	621	0.058	<0.04	0.124	0.061	<0.01	69.8	<0.01	<0.1	0.056	<0.02	61.1	0.153	<2	<0.04	<0.01
1.12	502.2	381	568	<0.1	<0.04	0.114	0.028	<0.01	60.2	<0.01	<0.1	0.064	<0.02	52.9	0.022	<2	<0.04	<0.01
0.8	497.3	376	589	0.041	<0.04	0.114	0.052	<0.01	55.5	<0.01	<0.1	0.058	<0.02	51.8	0.04	<2	<0.04	<0.01
0.7	482	427	626	0.34	<0.02	0.04	<0.1	<0.0005	68.3	0.006	<0.01	0.64	0.01	56	0.02	<0.0002	0.01	<0.01
0.84	472	440	634	0.03	<0.04	0.038	0.061	<0.0005	71.8	<0.005	<0.01	0.039	<0.02	58	<0.01	<0.0002	<0.01	<0.01
0.91	452	407	603	<0.1	<0.04	0.055	<0.05	<0.01	69	<0.01	<0.01	<0.01	<0.02	58	<0.01	<0.0002	<0.04	<0.01
1.13	466	425	637	0.495	<0.04	0.037	0.038	<0.01	78.9	<0.01	<0.01	0.561	<0.02	65.4	0.073	<0.0002	<0.04	<0.01
1.2	500	455	630	0.793	<0.04	0.04	0.085	<0.01	76.7	<0.01	<0.01	0.775	<0.02	58.6	0.077	<0.0002	<0.04	<0.01
1.5	481	471	694	0.051	<0.04	0.069	0.038	<0.01	68.9	<0.01	<0.01	0.08	<0.02	64.4	0.056	<0.0002	<0.01	<0.01
0.5	500	334	592	<0.02	<0.02	0.05	<0.005	<0.005	51.9	<0.005	<0.01	<0.04	<0.01	58.1	<0.01	<0.0002	0.02	<0.01
0.58	530	350	627	0.018	<0.04	0.06	<0.005	<0.005	49.4	<0.005	<0.01	0.115	0.024	54.1	<0.01	<0.0002	<0.01	<0.01
0.36	465	304	584	<0.1	<0.04	0.05	<0.01	<0.01	43.1	<0.01	<0.01	0.161	<0.02	50.2	<0.01	<0.0002	<0.04	<0.01
0.98	498	356	654	<0.1	<0.04	0.05	<0.01	<0.01	47.3	<0.01	<0.01	0.06	<0.02	52.2	<0.01	<0.0002	<0.04	<0.01
	483.5	310	638	0.064	<0.04	0.08	<0.01	<0.01	37.6	<0.01	<0.01							
1.1	563	591	1420	0.05	<0.02	<0.02	<0.005	<0.005	59.3	<0.005	<0.01	0.07	<0.01	102	<0.01	0.0003	0.02	<0.01
1.35	593	556	1500	0.134	<0.04	0.091	<0.005	<0.005	57.8	<0.01	<0.01	0.162	<0.02	101	0.013	<0.0002	<0.01	<0.01
1.16	548	570	1340	<0.1	<0.04	0.015	<0.01	<0.01	60.2	<0.01	<0.01	0.015	<0.02	103	<0.01	<0.0002	<0.04	<0.01
1.34	571	570	1420	0.105	<0.04	0.018	<0.005	<0.005	58.6	<0.005	<0.005	0.102	<0.005	99.3	<0.0002	<0.04	0.013	0.007
1.37	557	553	1460	0.086	<0.04	0.017	<0.01	<0.01	60.3	<0.01	<0.01	0.092	<0.02	104	<0.01	<0.0002	<0.04	<0.01
1.89	555	599	1500	<0.1	<0.04	0.017	<0.01	<0.01	60.4	<0.01	<0.01	0.032	<0.02	98.3	<0.01	<0.0002	<0.04	<0.01
1.4	577.4	647	1614	0.037	<0.04	0.022	<0.01	<0.01	60.2	<0.01	<0.01	0.07	0.02	104	<0.01	<0.0002	<0.01	<0.01

T-Selenium T-Sodium T-Zinc
mg/l mg/L mg/l

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<0.04 162 <0.01
<0.04 162 0.011

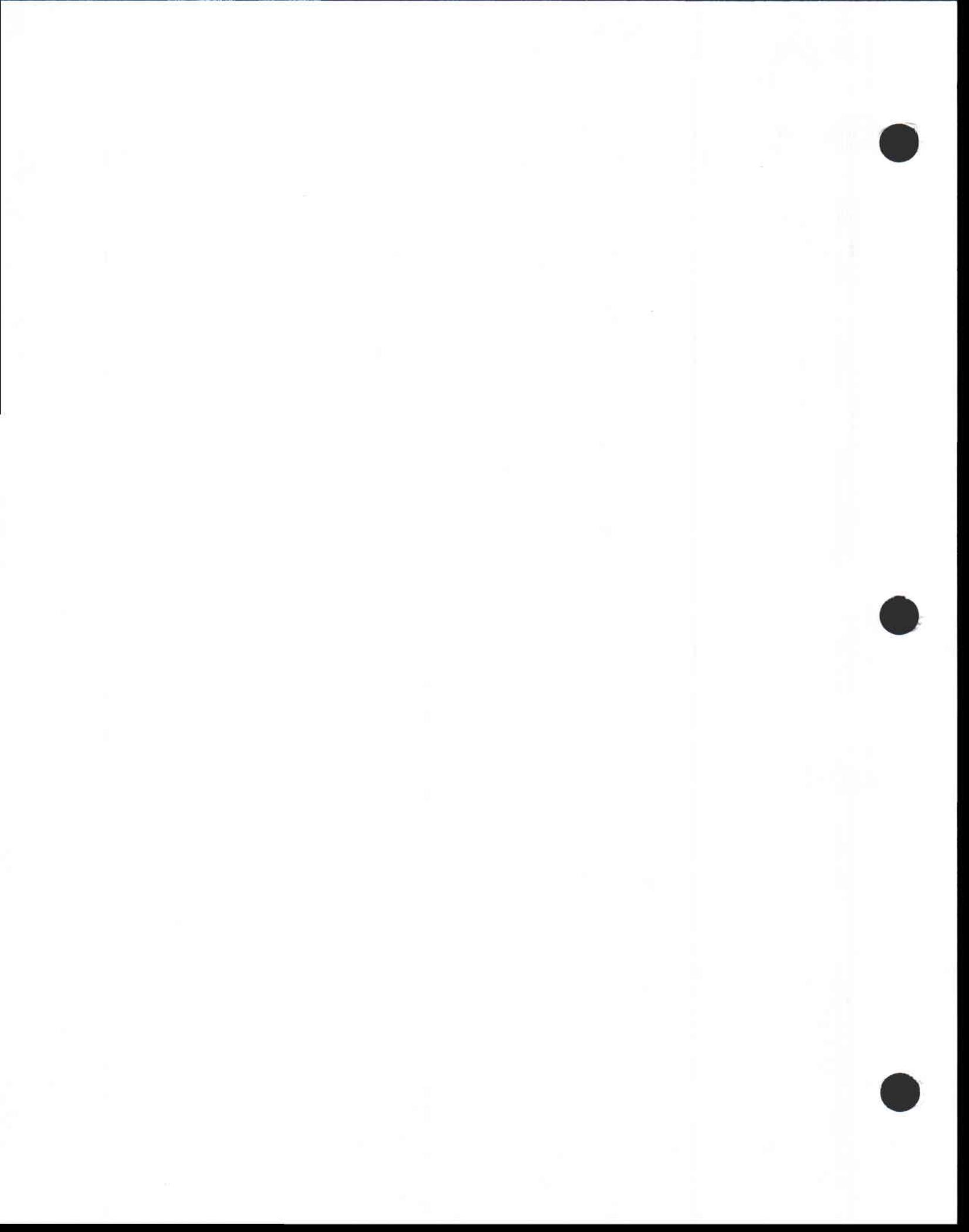
<0.04 64 <0.02
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<0.04 72.3 <0.01

<0.04 57.4 <0.02
<0.04 60.2 <0.01
<0.04 61 <0.01
<0.04 63.5 <0.01
<0.04 60.9 <0.01
<0.04 63.4 <0.01

<0.04 113 <0.02
<0.04 105 0.028
<0.04 105 0.022
<0.04 103 <0.01

<0.04 271 <0.02
<0.04 268 0.024
<0.04 281 0.466
<0.04 268 0.054
<0.04 292 <0.01
<0.04 270 <0.01
<0.04 276 <0.01

T-Selenium T-Sodium T-Zinc
mg/l mg/L mg/l





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

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January 8, 2002

TO: Internal File

FROM: Daron R. Haddock, Permit Supervisor 

RE: Response to Board Order, Finding that the Lila Canyon extension to the Horse Canyon Mine is processed as a new permit, UtahAmerican Energy, Inc., C/007/013, Internal File

SUMMARY:

The application for permitting the Lila Canyon facilities and federal lease was originally categorized as a Significant Revision. On December 14, 2001 the Board of Oil, Gas and Mining directed the Division to process the application as a new permit in accordance with R645-303-222. The following discussion documents the process used in permitting the Lila Canyon extension to the Horse Canyon Mine.

POLICY:

The current unwritten policy of the Division is to process extensions to an existing permit, other than incidental boundary changes, in the same manner as an application for a new permit. Rather than issue a new permit number and a second or third permit each time a new lease is added, the Division has chosen to revise or reissue the existing permit to include the extended permit area.

ANALYSIS AND FINDINGS:

Analysis #1:

R645-303-222 states that, "extensions to the approved permit area, except for Incidental Boundary Changes, must be processed and approved through application for a new permit and may not be approved under R645-303-221 through R645-303-228."

The application to add the Lila Canyon surface facilities and the associated federal lease to the Horse Canyon Mine will extend the permit area by 4704.34 Acres. Because this is an extension of an approved permit area it must be processed and approved as a new permit. This does not mean that the application needs to be assigned a new permit number or that an extension has to be separated from an existing permit. The very wording of the above regulation makes it clear that extensions to an already approved permit area are allowed and that changes to existing permits are contemplated. Indeed this very rule is found in the Utah regulations under the heading of "Permit Changes" (R645-220). It is clear that the Horse Canyon permit can be extended. It is also clear that extensions to approved permit areas must be accomplished under the same process as an application for a new permit. Emphasis should be placed on the process that is used and not on how the application is named.

Finding #1:

Changes to the Horse Canyon Mine permit are allowed under the R645 regulations. The Lila Canyon extension to the Horse Canyon Mine must be approved using the same process as an application for a new mine.

Analysis #2:

The administrative procedures for coal mine permitting are found at R645-300. This section sets forth the process which must be followed in order to issue a new permit. The specific requirements are discussed below.

Public Participation: R645-300-120

The first requirement after submitting an administratively complete application is to provide for public participation. The applicant must place an advertisement in a local newspaper of general circulation at least once a week for four consecutive weeks. The advertisement will contain 1) the name and business address of the applicant, 2) a description of the location and boundaries of the proposed permit area, 3) the location of where a copy of the application is available for public inspection, 4) the address of the Division where written comments, objections, or requests for informal conferences may be submitted, 5) a description of activity within 100 feet of the outside right-of-way of a public road.

The applicant, Utah American Energy Inc. placed an advertisement in the Sun Advocate on March 4, 11, 18, and 25 in 1999 and in the Emery County Progress on March 9, 16, 23, and 30 in 1999. It contained all of the necessary information required under R645-300.121. Utah American Energy Inc. also placed a copy of the application with the recorder at both the Carbon County courthouse and the Emery County courthouse as required by R645-300-121.200. The Division also notified local, state, and federal governmental agencies of Utah American Energy

Inc.'s intention to conduct coal mining and reclamation activities and solicited their input as required by R645-300-121.300.

Comments and Objections on Permit Application: R645-300-122

Written comments or objections to a permit application must be submitted to the Division within 30 days of the date of the last newspaper publication.

Only one comment from the public was received in the form of a letter of comment from a surface landowner, Josiah Eardley. His letter expressed concerns about potential for water loss on his property. The Division responded to Mr. Eardley's concern in a letter dated April 7, 1999. No other public comment was received and no request for a conference was received.

Informal Conferences: R645-300-123

Requests for informal conferences will be filed with the Division no later than 30 days after the last publication of the newspaper advertisement.

No request for an informal conference was made.

Public Availability of Permit Application: R645-124

Except for certain confidential information, all applications will be made available, at reasonable times, for public inspection and copying.

The Utah American Energy Inc. application was available for inspection and copying throughout the permitting process at the Division's Salt Lake City and Price offices. It was also available at the Carbon County and Emery County Records offices.

Review of Permit Application: R645-300-130

The Division will review permit applications according to the schedule outlined in this section of the regulations. The review will not exceed 120 days for significant revisions, 60 days for amendments, 120 days for permit renewals, and one year for new underground mine applications. Time is counted as cumulative days of Division review and does not include operator response time or delays attributed to conferences or hearings. The Utah American Energy Inc. application was reviewed well beyond the time allowed for significant revisions and was reviewed in line with the time allotted for new permit applications.

Review of Compliance: R645-300-132

The Division will make a finding that neither the applicant, nor any person who owns or controls the applicant, nor any person owned or controlled by the applicant is currently in

violation of any law, rule, or regulation referred to in this section. This determination is done through a check of the OSM Applicant Violator System. The Division completed this check on July 26, 2001 and a specific finding was written by Pam Grubaugh-Littig, Permit Supervisor, UCP, indicating that there were no outstanding violations blocking permit issuance. Another review was completed on January 9, 2002 with a resultant issue recommendation.

Written Findings for Permit Approval: R645-300-133

In order for a permit to be approved, specific written findings must be made that satisfy this section of the regulations. For the Utah American Energy Inc. application these findings were made and are included as part of the decision document. These written findings have been revised and are repeated below.

1. All procedures for public participation required by the Act, and the approved Utah State Program have been complied with. See Affidavit of Publication in Appendix 1-5 of PAP. (R645-300-120)
2. The permit application for the extraction of coal from federal leases SL-066145, SL-066490, U-014218, U-0126947, SL-069291, U-014217 using new surface facilities at Lila Canyon is accurate and complete and all requirements of the Surface Mining Control and Reclamation Act, and the approved Utah State Program (the "Act") have been complied with. See Technical Analysis dated July 19, 2001 and updated on January 9, 2002 to meet Board Order. (R645-300-133.100)
3. The proposed lands to be included within the permit area are:
 - a. Not included within an area designated unsuitable for underground coal mining operations (R645-300-133.220); A small portion of the proposed permit area addition overlaps with the Turtle Canyon Wilderness Study Area. The BLM's 1993 Environmental Assessment (EA) prepared for management of the Turtle Canyon Wilderness Study Area, states that underground mining would be acceptable in this area. Also see TA dated July 19, 2001 and updated on January 9, 2002 to meet Board Order.
 - b. not within an area under study for designated land unsuitable for underground coal mining operations (R645-300-133.210); The BLM's 1999 Utah Wilderness Inventory identifies the Desolation Canyon Wilderness Inventory Unit and the Turtle Canyon Inventory Unit as having wilderness characteristics, however, the BLM plan for this area has not changed to date. See TA dated July 19, 2001 and updated on January 9, 2002 to meet Board Order.
 - c. not on any lands subject to the prohibitions or limitation of 30 CFR 761.11 {a} (national parks, etc), 761.11 {f} (public buildings, etc.) and 761.11 {g} (cemeteries);
 - d. not within 100 feet of a public road except where the Lila Canyon road abuts the surface facilities area of the proposed mine. In this case the permittee has obtained permission from the road authority for conducting mining activity within 100 feet of the road. (R645-300-133.220) See July 18, 2001 Analysis and Findings on the Lila Canyon Road; and
 - e. not within 300 feet of any occupied dwelling (R645-300-133.220).
4. The applicant has the legal right to enter and complete mining activities in the Lila Canyon area through the federal coal leases and a right-of way issued by the Bureau of Land Management. (See September 7, 2001 letter to Lowell Braxton verifying that the leases are assigned to UEI and ROW dated July 27, 2001). (R645-300-133.300)
5. An assessment of the probable cumulative impacts of all anticipated coal mining and reclamation activities in the general area on the hydrologic balance has been conducted by the Division and no significant impacts were identified. See CHIA dated July 19, 2001. The Mining and Reclamation Plan

(MRP) proposed under the revised application has been designed to prevent damage to the hydrologic balance in the permit area and in associated off-site areas. (R645-300-133.400 and UCA 40-10-11 (2)(c))

6. The operation would not affect the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitats as determined under the Endangered Species Act of 1973. The original Section 7 consultation with the Fish and Wildlife Service (letter dated April 28 2000) stated that no species-specific protective measures are considered necessary for the project, however recent correspondence (letter dated July 18, 2001) identified the possibility of spotted owl habitat within the permit area. To protect the spotted owl the following stipulation has been added to the permit: Prior to any surface disturbing activities, the Permittee must have a qualified person determine whether the proposed addition to the permit area contains suitable habitat for the Mexican spotted owl. Depending on the results of this evaluation, the Permittee will modify the mining and reclamation plan in accordance with requirements of the USFWS. An alternative to this action is to limit all coal mining and reclamation activities to time periods outside the breeding season, March 1 to August 31. (16 USC 1531 et seq.) (R645-300-133.500)
7. The Division's issuance of a permit is in compliance with the National Historic Preservation Act and implementing regulations (36 CFR 800). See Technical Analysis dated July 19, 2001 and updated on January 9, 2002 to meet Board Order. (R645-300-133.600)
8. The applicant proposes acceptable practices for the reclamation of disturbed lands. The Division has determined that reclamation, as required by the Act can be feasibly accomplished following the approved plan as outlined in the PAP. See Technical Analysis dated July 19, 2001 and updated on January 9, 2002 to meet Board Order. (R645-300-133.710)
9. The applicant has demonstrated that all mine facilities and structures will comply with the applicable performance standards of R645-301. No special categories of mining are proposed so the R645-302 regulations do not apply. The Lila Canyon facilities will be newly constructed and will not utilize any existing structures. (R645-300-133.720, R645-300-133.740)
10. A 510 (c) report has been run on the Applicant Violator System (AVS), which shows that: prior violations of applicable laws and regulations have been corrected; neither UtahAmerican Energy, Inc. or any affiliated company, are delinquent in payment of fees for the Abandoned Mine Reclamation Fund; and the applicant does not control and has not controlled mining operations with demonstrated pattern of willful violations of the Act of such nature, duration, and with such resulting irreparable damage to the environment as to indicate an intent not to comply with the provisions of the Act. (See 510 (c) reports dated July 26, 2001 and January 9, 2002) (R645-300-133.730)
11. The proposed postmining land-use of the permit area will remain the same as the pre-mining land use. (R645-300-133.750)
12. The applicant has posted a surety bond for the Horse Canyon Mine which includes the Lila Canyon facilities in the amount of \$2,809,000, payable to the Office of Surface Mining as well as the Utah Division of Oil Gas and Mining. (R645-300-134)
13. No lands designated as prime farmlands or alluvial valley floors occur on the permit area. See Technical Analysis dated July 19, 2001 and updated on January 9, 2002 to meet Board Order (R645-302-313.100 and R645-302-321.100)
14. The Division has made all specific approvals required by the Act, the Cooperative Agreement, and the Federal Lands Program.

The applicant has submitted a complete and accurate application and has complied with all the requirements of the State program.

Performance Bond Submittal: R645-300-134

If the Division decides to approve the application, it will require that the applicant file a performance bond or provide other equivalent guarantee before the permit is issued, in accordance with the provisions of R645-301-800.

Utah American Energy Inc. posted a reclamation bond in the amount of \$2,809,000 which is the appropriate amount determined by the Division.

Permit Conditions: R645-300-140

This section spells out the conditions that must be part of each permit issued by the Division. Each of the permits issued by the Division contain this standard language.

The permit the Division issued to Utah American Energy Inc. on July 26, 2001 contains all of the standard conditions found in this section of the regulations.

Permit Term R645-300-153

Each permit will be issued for a fixed term of five years or less. The Horse Canyon permit, which included the Lila Canyon extension, was issued effective July 27, 2001 and expires on May 6, 2006.

The permit term is consistent with the requirements of the regulations.

Finding #2:

The Utah American Energy Inc. application to add the Lila Canyon facilities and federal lease to the Horse Canyon Permit was processed under all of the regulations as analyzed above, required for new permitting actions.

CONCLUSION:

R645-303-122 has been satisfied and the Board Order has been met. The Lila Canyon extension to the Horse Canyon Mine is processed as a new permit.



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

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OK

January 8, 2002

TO: Internal File

FROM: Daron R. Haddock, Permit Supervisor 

RE: Response to Board Order, Finding that the Lila Canyon extension to the Horse Canyon Mine is processed as a new permit, UtahAmerican Energy, Inc., C/007/013, Internal File

SUMMARY:

The application for permitting the Lila Canyon facilities and federal lease was originally categorized as a Significant Revision. On December 14, 2001 the Board of Oil, Gas and Mining directed the Division to process the application as a new permit in accordance with R645-303-222. The following discussion documents the process used in permitting the Lila Canyon extension to the Horse Canyon Mine.

POLICY:

The current unwritten policy of the Division is to process extensions to an existing permit, other than incidental boundary changes, in the same manner as an application for a new permit. Rather than issue a new permit number and a second or third permit each time a new lease is added, the Division has chosen to revise or reissue the existing permit to include the extended permit area.

ANALYSIS AND FINDINGS:

Analysis #1:

R645-303-222 states that, "extensions to the approved permit area, except for Incidental Boundary Changes, must be processed and approved through application for a new permit and may not be approved under R645-303-221 through R645-303-228."



The application to add the Lila Canyon surface facilities and the associated federal lease to the Horse Canyon Mine will extend the permit area by 4704.34 Acres. Because this is an extension of an approved permit area it must be processed and approved as a new permit. This does not mean that the application needs to be assigned a new permit number or that an extension has to be separated from an existing permit. The very wording of the above regulation makes it clear that extensions to an already approved permit area are allowed and that changes to existing permits are contemplated. Indeed this very rule is found in the Utah regulations under the heading of "Permit Changes" (R645-220). It is clear that the Horse Canyon permit can be extended. It is also clear that extensions to approved permit areas must be accomplished under the same process as an application for a new permit. Emphasis should be placed on the process that is used and not on how the application is named.

Finding #1:

Changes to the Horse Canyon Mine permit are allowed under the R645 regulations. The Lila Canyon extension to the Horse Canyon Mine must be approved using the same process as an application for a new mine.

Analysis #2:

The administrative procedures for coal mine permitting are found at R645-300. This section sets forth the process which must be followed in order to issue a new permit. The specific requirements are discussed below.

Public Participation: R645-300-120

The first requirement after submitting an administratively complete application is to provide for public participation. The applicant must place an advertisement in a local newspaper of general circulation at least once a week for four consecutive weeks. The advertisement will contain 1) the name and business address of the applicant, 2) a description of the location and boundaries of the proposed permit area, 3) the location of where a copy of the application is available for public inspection, 4) the address of the Division where written comments, objections, or requests for informal conferences may be submitted, 5) a description of activity within 100 feet of the outside right-of-way of a public road.

The applicant, Utah American Energy Inc. placed an advertisement in the Sun Advocate on March 4, 11, 18, and 25 in 1999 and in the Emery County Progress on March 9, 16, 23, and 30 in 1999. It contained all of the necessary information required under R645-300.121. Utah American Energy Inc. also placed a copy of the application with the recorder at both the Carbon County courthouse and the Emery County courthouse as required by R645-300-121.200. The Division also notified local, state, and federal governmental agencies of Utah American Energy

Inc.'s intention to conduct coal mining and reclamation activities and solicited their input as required by R645-300-121.300.

Comments and Objections on Permit Application: R645-300-122

Written comments or objections to a permit application must be submitted to the Division within 30 days of the date of the last newspaper publication.

Only one comment from the public was received in the form of a letter of comment from a surface landowner, Josiah Eardley. His letter expressed concerns about potential for water loss on his property. The Division responded to Mr. Eardley's concern in a letter dated April 7, 1999. No other public comment was received and no request for a conference was received.

Informal Conferences: R645-300-123

Requests for informal conferences will be filed with the Division no later than 30 days after the last publication of the newspaper advertisement.

No request for an informal conference was made.

Public Availability of Permit Application: R645-124

Except for certain confidential information, all applications will be made available, at reasonable times, for public inspection and copying.

The Utah American Energy Inc. application was available for inspection and copying throughout the permitting process at the Division's Salt Lake City and Price offices. It was also available at the Carbon County and Emery County Recorders offices.

Review of Permit Application: R645-300-130

The Division will review permit applications according to the schedule outlined in this section of the regulations. The review will not exceed 120 days for significant revisions, 60 days for amendments, 120 days for permit renewals, and one year for new underground mine applications. Time is counted as cumulative days of Division review and does not include operator response time or delays attributed to conferences or hearings. The Utah American Energy Inc. application was reviewed well beyond the time allowed for significant revisions and was reviewed in line with the time allotted for new permit applications.

Review of Compliance: R645-300-132

The Division will make a finding that neither the applicant, nor any person who owns or controls the applicant, nor any person owned or controlled by the applicant is currently in

violation of any law, rule, or regulation referred to in this section. This determination is done through a check of the OSM Applicant Violator System. The Division completed this check on July 26, 2001 and a specific finding was written by Pam Grubaugh-Littig, Permit Supervisor, UCP, indicating that there were no outstanding violations blocking permit issuance. Another review was completed on January 9, 2002 with a resultant issue recommendation.

Written Findings for Permit Approval: R645-300-133

In order for a permit to be approved, specific written findings must be made that satisfy this section of the regulations. For the Utah American Energy Inc. application these findings were made and are included as part of the decision document. These written findings have been revised and are repeated below.

1. All procedures for public participation required by the Act, and the approved Utah State Program have been complied with. See Affidavit of Publication in Appendix 1-5 of PAP. (R645-300-120)
2. The permit application for the extraction of coal from federal leases SL-066145, SL-066490, U-014218, U-0126947, SL-069291, U-014217 using new surface facilities at Lila Canyon is accurate and complete and all requirements of the Surface Mining Control and Reclamation Act, and the approved Utah State Program (the "Act") have been complied with. See Technical Analysis dated July 19, 2001 and updated on January 9, 2002 to meet Board Order. (R645-300-133.100)
3. The proposed lands to be included within the permit area are:
 - a. Not included within an area designated unsuitable for underground coal mining operations (R645-300-133.220); A small portion of the proposed permit area addition overlaps with the Turtle Canyon Wilderness Study Area. The BLM's 1993 Environmental Assessment (EA) prepared for management of the Turtle Canyon Wilderness Study Area, states that underground mining would be acceptable in this area. Also see TA dated July 19, 2001 and updated on January 9, 2002 to meet Board Order.
 - b. not within an area under study for designated land unsuitable for underground coal mining operations (R645-300-133.210); The BLM's 1999 Utah Wilderness Inventory identifies the Desolation Canyon Wilderness Inventory Unit and the Turtle Canyon Inventory Unit as having wilderness characteristics, however, the BLM plan for this area has not changed to date. See TA dated July 19, 2001 and updated on January 9, 2002 to meet Board Order.
 - c. not on any lands subject to the prohibitions or limitation of 30 CFR 761.11 {a} (national parks, etc), 761.11 {f} (public buildings, etc.) and 761.11 {g} (cemeteries);
 - d. not within 100 feet of a public road except where the Lila Canyon road abuts the surface facilities area of the proposed mine. In this case the permittee has obtained permission from the road authority for conducting mining activity within 100 feet of the road. (R645-300-133.220) See July 18, 2001 Analysis and Findings on the Lila Canyon Road; and
 - e. not within 300 feet of any occupied dwelling (R645-300-133.220).
4. The applicant has the legal right to enter and complete mining activities in the Lila Canyon area through the federal coal leases and a right-of way issued by the Bureau of Land Management. (See September 7, 2001 letter to Lowell Braxton verifying that the leases are assigned to UEI and ROW dated July 27, 2001). (R645-300-133.300)
5. An assessment of the probable cumulative impacts of all anticipated coal mining and reclamation activities in the general area on the hydrologic balance has been conducted by the Division and no significant impacts were identified. See CHIA dated July 19, 2001. The Mining and Reclamation Plan

(MRP) proposed under the revised application has been designed to prevent damage to the hydrologic balance in the permit area and in associated off-site areas. (R645-300-133.400 and UCA 40-10-11 (2)(c))

6. The operation would not affect the continued existence of any threatened or endangered species or result in the destruction or adverse modification of their critical habitats as determined under the Endangered Species Act of 1973. The original Section 7 consultation with the Fish and Wildlife Service (letter dated April 28 2000) stated that no species-specific protective measures are considered necessary for the project, however recent correspondence (letter dated July 18, 2001) identified the possibility of spotted owl habitat within the permit area. To protect the spotted owl the following stipulation has been added to the permit: Prior to any surface disturbing activities, the Permittee must have a qualified person determine whether the proposed addition to the permit area contains suitable habitat for the Mexican spotted owl. Depending on the results of this evaluation, the Permittee will modify the mining and reclamation plan in accordance with requirements of the USFWS. An alternative to this action is to limit all coal mining and reclamation activities to time periods outside the breeding season, March 1 to August 31. (16 USC 1531 et seq.) (R645-300-133.500)
7. The Division's issuance of a permit is in compliance with the National Historic Preservation Act and implementing regulations (36 CFR 800). See Technical Analysis dated July 19, 2001 and updated on January 9, 2002 to meet Board Order. (R645-300-133.600)
8. The applicant proposes acceptable practices for the reclamation of disturbed lands. The Division has determined that reclamation, as required by the Act can be feasibly accomplished following the approved plan as outlined in the PAP. See Technical Analysis dated July 19, 2001 and updated on January 9, 2002 to meet Board Order. (R645-300-133.710)
9. The applicant has demonstrated that all mine facilities and structures will comply with the applicable performance standards of R645-301. No special categories of mining are proposed so the R645-302 regulations do not apply. The Lila Canyon facilities will be newly constructed and will not utilize any existing structures. (R645-300-133.720, R645-300-133.740)
10. A 510 (c) report has been run on the Applicant Violator System (AVS), which shows that: prior violations of applicable laws and regulations have been corrected; neither UtahAmerican Energy, Inc. or any affiliated company, are delinquent in payment of fees for the Abandoned Mine Reclamation Fund; and the applicant does not control and has not controlled mining operations with demonstrated pattern of willful violations of the Act of such nature, duration, and with such resulting irreparable damage to the environment as to indicate an intent not to comply with the provisions of the Act. (See 510 (c) reports dated July 26, 2001 and January 9, 2002) (R645-300-133.730)
11. The proposed postmining land-use of the permit area will remain the same as the pre-mining land use.(R645-300-133.750)
12. The applicant has posted a surety bond for the Horse Canyon Mine which includes the Lila Canyon facilities in the amount of \$2,809,000, payable to the Office of Surface Mining as well as the Utah Division of Oil Gas and Mining. (R645-300-134)
13. No lands designated as prime farmlands or alluvial valley floors occur on the permit area. See Technical Analysis dated July 19, 2001 and updated on January 9, 2002 to meet Board Order (R645-302-313.100 and R645-302-321.100)
14. The Division has made all specific approvals required by the Act, the Cooperative Agreement, and the Federal Lands Program.

The applicant has submitted a complete and accurate application and has complied with all the requirements of the State program.

Performance Bond Submittal: R645-300-134

If the Division decides to approve the application, it will require that the applicant file a performance bond or provide other equivalent guarantee before the permit is issued, in accordance with the provisions of R645-301-800.

Utah American Energy Inc. posted a reclamation bond in the amount of \$2,809,000 which is the appropriate amount determined by the Division.

Permit Conditions: R645-300-140

This section spells out the conditions that must be part of each permit issued by the Division. Each of the permits issued by the Division contain this standard language.

The permit the Division issued to Utah American Energy Inc. on July 26, 2001 contains all of the standard conditions found in this section of the regulations.

Permit Term R645-300-153

Each permit will be issued for a fixed term of five years or less. The Horse Canyon permit, which included the Lila Canyon extension, was issued effective July 27, 2001 and expires on May 6, 2006.

The permit term is consistent with the requirements of the regulations.

Finding #2:

The Utah American Energy Inc. application to add the Lila Canyon facilities and federal lease to the Horse Canyon Permit was processed under all of the regulations as analyzed above, required for new permitting actions.

CONCLUSION:

R645-303-122 has been satisfied and the Board Order has been met. The Lila Canyon extension to the Horse Canyon Mine is processed as a new permit.



2007



**BOOK CLIFFS AREA
CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT (CHIA)**

For

**HORSE CANYON MINE
LILA CANYON ~~EXTENSION~~ ~~SIGNIFICANT REVISION~~ TO THE HORSE CANYON MINE
C/007/013**

In

CARBON AND EMERY COUNTIES, UTAH

January 9, 2002 ~~July 19, 2001~~

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TABLE OF CONTENTS

I INTRODUCTION	1
II. CUMULATIVE IMPACT AREA (CIA)	7
SCOPE OF MINING	9
Horse Canyon Mine	9
Book Cliffs Mine	11
Other	11
III. HYDROLOGIC SYSTEM and BASELINE CONDITIONS.....	12
GEOLOGY	12
Stratigraphy.....	12
Coal	12
Structure	13
<i>MINOR COAL</i>	<i>14</i>
HYDROLOGY	15
Ground water.....	15
Surface Water.....	25
SURFACE WATER HYDROLOGY OF THE CIA	29
Horse Canyon.....	30
Lila Canyon.....	31
Little Park Wash.....	31
Grassy Trail Creek	31
CLIMATOLOGIC INFORMATION	35
Wind.....	37
IV. IDENTIFY HYDROLOGIC CONCERNS.....	39
V. IDENTIFY RELEVANT STANDARDS	41
RELEVANT STANDARDS	41
MATERIAL DAMAGE	42
Low-Flow Discharge Rate	43
Total Dissolved Solids (TDS).....	44
Sediment Load	44
Parameters for ground-water quantity and quality.....	45
Seasonal flow from springs.....	45
TDS concentration	45
VI. ESTIMATE PROBABLE FUTURE IMPACTS OF MINING ACTIVITY.....	46
GROUND WATER	46
Dewatering.....	47
SURFACE WATER	49
Water Quality.....	49
CIA Sediment Control	50
Water Quantity.....	51
ALLUVIAL VALLEY FLOORS	52
VII. ASSESS PROBABLE MATERIAL DAMAGE.	53
FUTURE MINING	53
VII. STATEMENT OF FINDINGS.	55
VIII. REFERENCES.....	56

BOOK CLIFFS AREA

I INTRODUCTION

_____ It is the job of the Reclamation Specialist to assess the potential for mining impacts, on and off the permit area, in accordance with the Utah Coal Mining Rules. Reviewing the PAP alone is not sufficient to assess impacts to the geologic and hydrologic regimes. Specific knowledge of the geologic mechanics and hydrologic functions are pertinent in assessing the dynamics and interactions of chemistry, movement of surface and ground waters, and any associated subsidence impacts to a minesite. The Reclamation Specialist uses pertinent information from many sources, e.g. geological and hydrological reports, texts, site visits and a knowledge base built on experience and training.

The applicant uses the term "regional aquifer" several times throughout the Lila Extension PAP, and this is a common phrase used by mining operators in the Carbon and Emery County coal fields. It usually refers to any water found in the Starpoint Sandstone and Blackhawk Formation irrespective of quality, quantity, use, storage, flow and transport, and discharge. (The Star Point and Blackhawk are part of the Mesa Verde Group. The Star Point Sandstone is absent south of Soldier Creek.) In some cases "regional aquifer" is a viable term where water resources emanate from these geologic units and are readily used for a specific purpose. This term was used by the applicant in the Lila Extension PAP; however, the Division has adhered to the definition of "aquifer" as found in the Coal Mining Rules (R645-100-200.), and after evaluating the geologic and hydrologic evidence, does not consider the saturated strata in the Blackhawk and associated formations in the Horse Canyon Mine and Lila Canyon Extension permit area and adjacent areas to be an aquifer. Except for a general reference in Figure 12, which is for diagrammatic purposes only, the term "regional aquifer" has been deliberately avoided throughout this CHIA. The Division prefers the cross-section shown in Osterwald, 1981 to illustrate the geologic relationships over the region.

The Horse Canyon Mine and the proposed Lila Canyon ~~Extension Mine~~, an extension of ~~significant revision to the~~ Horse Canyon mine permit, are located approximately 30 miles east of Price, Utah in the Book Cliffs Coal Field (Figure 1). The Book Cliffs form a rugged escarpment (Figure 2) that faces south and southwest and separates the Uintah Basin from the San Rafael Swell.

Elevations along the Book Cliffs range from approximately 5,000 to 10,000 feet. Steep, narrow canyons and high peaks are characteristic. Because of the rugged topography, land uses are generally limited to wildlife habitat, rangeland, and recreation, but timber is harvested in some areas. A large portion of the surface area is public land managed by the Bureau of Land Management (BLM).

The Book Cliffs area is classified as mid-latitude steppe to semi-arid desert. The climate is characterized by warm, moist springs and summers and by cold, dry winters. Precipitation varies from 20 inches at the highest elevations to 8 inches along the Price River downstream of the town of Wellington. Mean annual precipitation is about 12 inches, with most precipitation occurring during the late summer and early fall. Temperatures range from summer highs in the 90's to below zero during the winter months.

BOOK CLIFFS AREA

Book Cliffs Coal Field

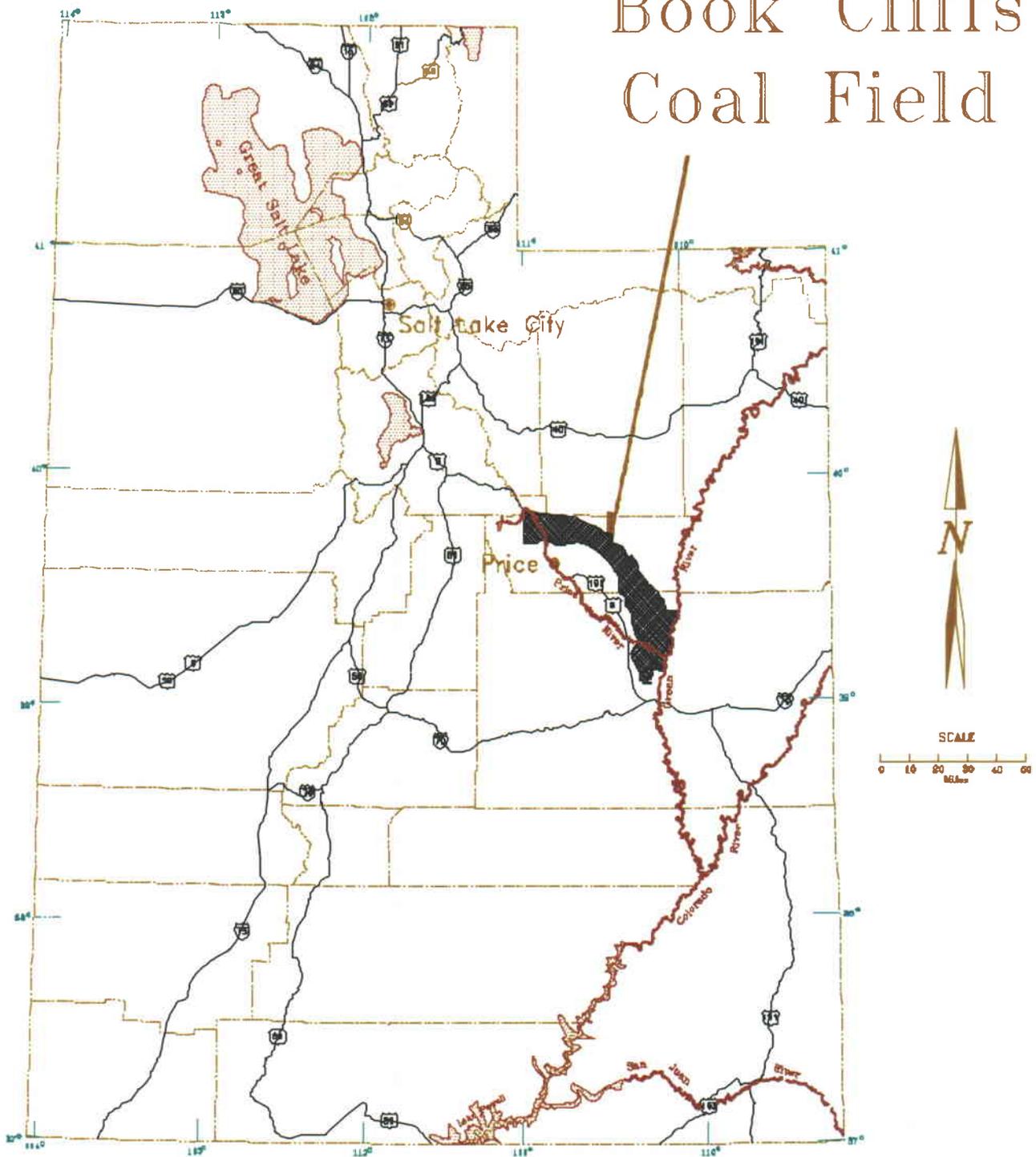


Figure 1 – Location of the Book Cliffs Coal Field in the State of Utah

BOOK CLIFFS AREA

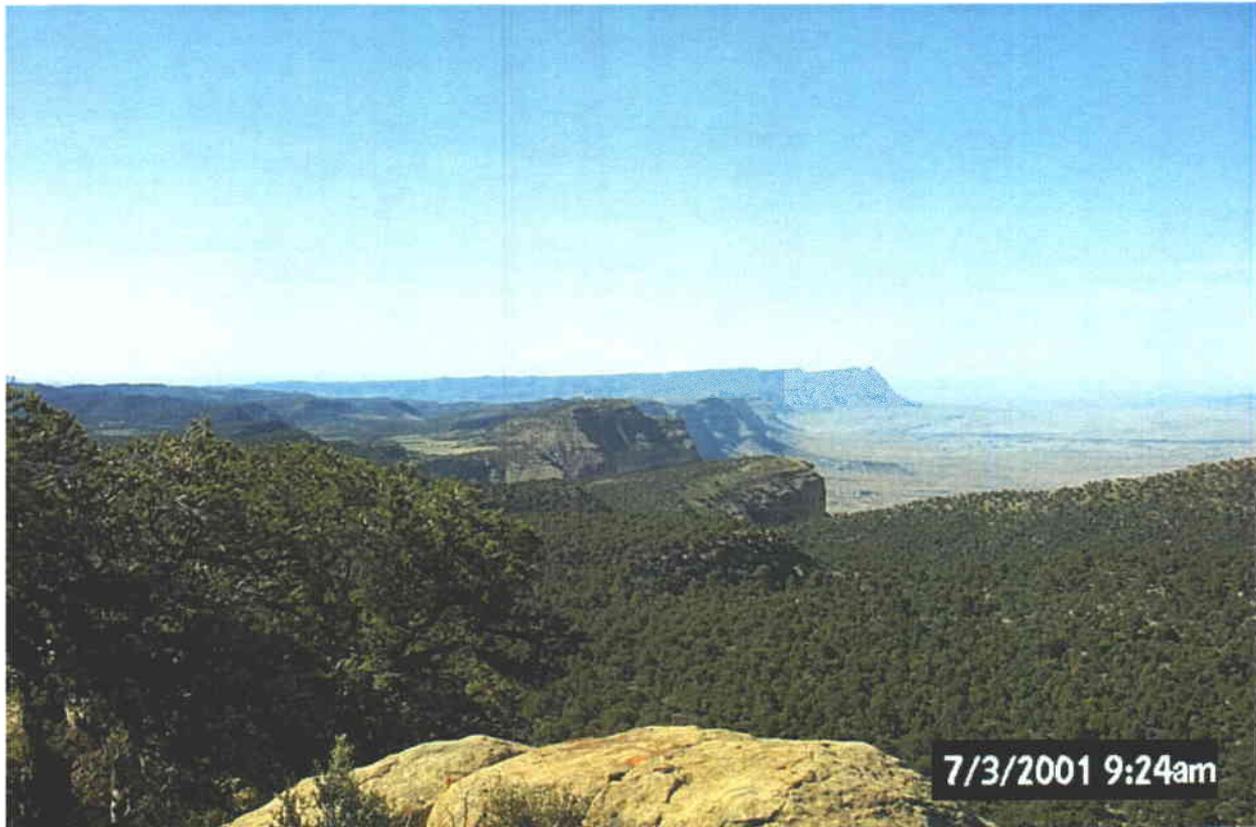


Figure 2 Book Cliffs escarpment. Looking southwest from atop the Book Cliffs escarpment above the proposed Lila Canyon Extension Mine.

Vegetation varies from the sagebrush/grass community type at lower elevations to pinyon/juniper, sagebrush, and saltbush/Salina wild rye at higher elevations. Most of the Lila Canyon area is dominated by the pinyon/juniper community. Cliff-forming rock outcrops have little or no vegetation, and the Lila Canyon area doesn't have the deep, protected canyons with more mesic vegetation found at other places along the Book Cliffs, such as at the West Ridge Mine to the north. The land is mainly used for wildlife habitat and livestock grazing.

Outcropping rocks of the Book Cliffs range from Upper Cretaceous to Quaternary in age. The rock record reflects an overall regressive sequence from marine (Mancos Shale) on the valley floor and at the base of the cliffs, up through littoral and lagoonal (Star Point Sandstone and lower Blackhawk Formation), to fluvial (upper Blackhawk Formation, Castlegate Sandstone, Price River Formation and North Horn Formation), and lacustrine (Flagstaff Formation and Green River Formation) depositional environments. The Colton Formation is a fluvial-deltaic sequence separating the Flagstaff and Green River deposits. The Blackhawk Formation is the major coal-bearing unit within the Book Cliffs Coal Field. Members of the Blackhawk Formation were deposited in an oscillating regressive seaway during the Cretaceous Period.

Surface runoff from the Book Cliffs flows into the Price River drainage basin of south-central Utah (Figure 3). Several rivers flow into the Price River including the White River,

BOOK CLIFFS AREA

Willow Creek, Coal Creek, Grassy Trail Creek and Horse Canyon Creek. The Price River flows southeasterly and joins the Green River approximately 15 miles north of the town of Green River, Utah. Water quality is good in the mountainous headwater tributaries, but deteriorates rapidly after the river leaves Price Canyon and flows across the Mancos Shale. The Mancos typically has low permeability, is easily eroded, and contains large quantities of soluble salts. Total dissolved solids (TDS) levels of 3,000 mg/L and sulfate concentrations over 1,000 mg/L are not uncommon in the lower reaches of the Price River.

This Cumulative Hydrologic Impact Assessment (CHIA) is a findings document involving an assessment of the cumulative impact of all anticipated coal mining operations on the hydrologic balance within the Cumulative Impact Area (CIA). The only currently anticipated coal mining operation is the **Lila Canyon** Extension of the Horse Canyon Mine (**Figure 3**).

The CHIA is not a determination if coal mining operations are designed to prevent material damage beyond their respective permit boundaries when considered individually, but rather is a determination if there will be material damage resulting from effects that become cumulative outside the individual permit boundaries. This report complies with federal legislation passed under the Surface Mining Control and Reclamation Act (SMCRA) and subsequent Utah and federal regulatory programs under R645-301-729 and 30 CFR 784.14(f), respectively.

The objective of a CHIA document is to:

1. Identify the Cumulative Impact Area (CIA) **(Part II)**
2. Describe the hydrologic system – including geology, identify hydrologic resources and uses, and document baseline conditions of surface and ground-water quality and quantity. **(Part III)**
3. Identify hydrologic concerns. **(Part IV)**
4. Identify relevant standards against which predicted impacts can be compared **(Part V)**
5. Estimate probable future impacts of mining activity with respect to the parameters identified in 4 **(Part VI)**
6. Assess probable material damage **(Part VII)**
7. Make a statement of findings **(Part VIII)**

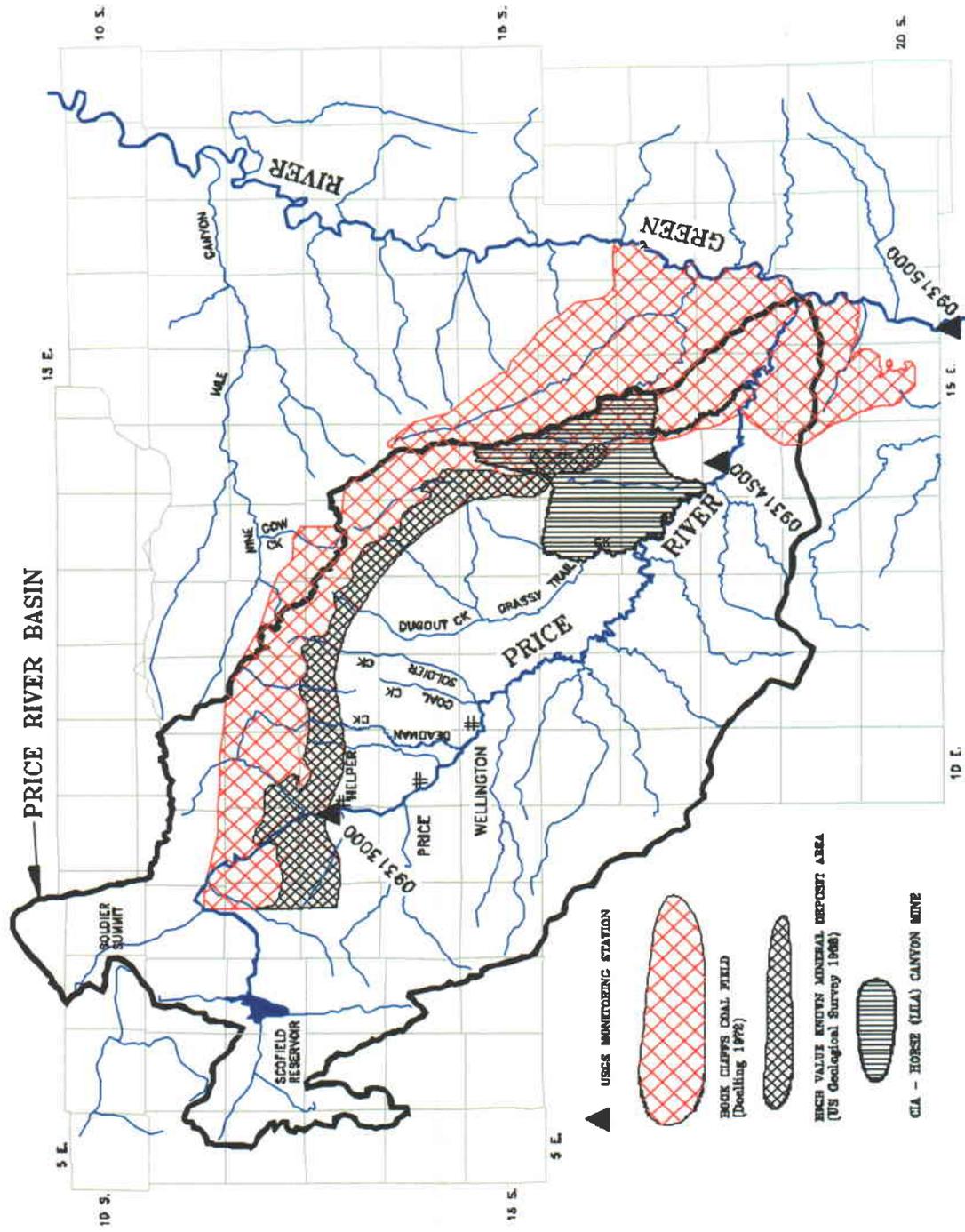


Figure 3 – Horse Canyon– Lila Canyon Cumulative Impact Area (CIA)

BOOK CLIFFS AREA

A CHIA was prepared in 1991 for the Horse Canyon Mine, which at that time was permitted by Intermountain Power Agency (IPA). The disturbed area in Horse Canyon has been partially reclaimed since 1986 and Phase I bond release was approved in 1997. Phase II bond release has recently been conditionally approved by the Utah Division of Oil, Gas and Mining (UDOGM). To complete Phase II the operator needs to remove a culvert and reestablish the channel at the refuse pile, remove all silt fences from the reclaimed sites and reclaim the #2 sedimentation pond. Some active areas still exist that are excluded from the reclamation bond. They include several large buildings, a powder magazine, a sealed portal, the #1 sedimentation pond, and a water tank.

UtahAmerican Energy Incorporated (UEI) acquired six federal coal leases from Basic Management in 1999, which subleased them from IPA in August 1998. UEI purchased the leases in June 2000. These leases are in the North Block LMU of the old Kaiser South Leases (Figure 4, page 5). The South Block has been withdrawn by the BLM.

II. CUMULATIVE IMPACT AREA (CIA)

The Horse Canyon Mine Cumulative Impact Area (CIA) is shown on Plate 1 and Figures 3 and 4. This area is shown on the Lila Point, Cedar, Grassy, and Woodside USGS 7.5 minute quadrangles. The CIA is the area within which past, present, and anticipated or foreseeable coal mining activities may interact to affect the surface and ground water. The CIA was established and based on anticipated mining activities, knowledge of surface and ground-water resources, and anticipated impacts of mining on those water resources.

The Horse Canyon Mine CIA encompasses roughly 73,000 acres (114 miles²). The permit area of the Horse Canyon Mine, including the Lila Canyon Extension~~revision~~, is 6,032 acres, which includes 5,544 acres in six federal coal leases plus state coal leases and fee coal. The estimated size of the disturbed area for the Lila Canyon project is 48 acres: the old Horse Canyon Mine disturbed 61 acres, which are being reclaimed. There is additional federal coal south of the Horse Canyon permit area that has been leased in the past as part of an LMU, but which is not currently under lease. This area has been included in the CIA because UEI has indicated they anticipate mining that area at some as-yet undetermined future date.

Horse Canyon is one of the major surface drainages for this CIA. Little Park Wash drains the area ~~overlying~~^{above} the Lila Canyon Extension~~Mine~~. Horse Canyon, Lila Canyon and Little Park Wash are all intermittent drainages in the Book Cliffs escarpment. These drainages function as ephemeral streams; however, they have drainage areas of over a square mile and, as such, are classified as intermittent drainages according to the Utah Coal Rules definition (R645-100-200). Surface waters in the CIA flow off the escarpment then across the lower end of Clark Valley, an arid sagebrush desert, over 12 miles to the Price River. The Price River eventually discharges to the Green River just above the confluence with the Colorado River.

Range Creek is the perennial stream nearest to the Lila Canyon Extension permit area, the nearest reach being approximately three miles to the east-northeast, at an approximate elevation of 6,700 feet. Range Creek is in a broad, south-southeast oriented drainage that has been eroded into the Roan Cliffs, and as a result, at the latitude of the Lila Canyon Extension, the main body of the Roan Cliffs is to the east and a narrow western extension of the Roan Cliffs named Patmos Ridge lies between Range Creek and the Book Cliffs. The mineable coal located in the Lila Canyon Extension, is stratigraphically well below the sediments exposed in Range Creek.

The Roan Cliffs were named for the characteristic color given them by the Colton Formation. The Colton Formation is exposed at the surface from Patmos Ridge east to the main body of the Roan Cliffs, and between these two escarpments Range Creek has eroded into but not through the Colton. Approximately eleven miles southeast of the Lila Canyon Extension permit area, just upstream of Turtle Canyon, Range Creek has eroded through the Colton, Flagstaff, and North Horn Formations, but it reaches the Green River without having eroded through the Upper Price River Formation. The nearest Blackhawk outcrop is 10 miles south,

BOOK CLIFFS AREA

along the Price River in the canyon between the Book Cliffs and the Beckwith Plateau. The Lila Canyon Extension application (Section 724.200; B# 005347) states that there was no collection of baseline data from Range Creek because of the distance from the Horse Canyon Mine. In its decision not to require monitoring of this stream and not to include any part of the drainage in the CIA, the Division also evaluated the elevation difference between the saturated zone in the Blackhawk Formation and the Range Creek drainage - especially the reaches nearest the permit area, and also the thick section of low - permeability strata between the Blackhawk and the Colton Formations.

Dip of strata can be an important factor in ground-water flow, but there is no geologic or hydrologic evidence that water flows from the Lila side of Patmos Ridge towards Range Creek drainage. The updip exposures of the Colton and North Horn - Flagstaff Formations along Little Park Wash are areas of ground-water discharge, not recharge. Examination of water rights and topographic maps, although certainly not as accurate as a detailed seep and spring survey, nevertheless indicates ground-water discharge on the Range Creek side of Patmos Ridge is much less than on the Lila side. Furthermore, if the deeper ground water in the Blackhawk Formation were to flow following the projected dip, it would flow well below the reach of Range Creek that is nearest the Lila mine, and the thick section of low-permeability strata between the Colton and the Blackhawk Formations would impede hydraulic interaction between that deep ground water and the surface (Figure 5).

Faults can also be important factors in ground water flow. Both lateral and vertical flow may be channeled through faults and fractures, but plastic or swelling clays that can seal faults and fractures are abundant (Figure 6). The Sunnyside Fault Zone is a major north-northwest striking feature throughout much of the Sunnyside Mining District, extending from West Ridge to the Horse Canyon Mine (Osterwald and others, 1981; see References B# 005326-005328). Extension of the Sunnyside Fault Zone south to the Horse Canyon Mine is uncertain (Osterwald and others, 1981; see References B# 005326-005328: Lila Extension PAP Plate 6-1, B# 005326), but it may continue to the east of the Lila Canyon Extension (Dunrud and Barnes, 1972; see References B# 005326-005328: Lila Extension PAP, page 28 of Chapter 6; B# 005184). Faults that strike basically east-west were mapped by Osterwald throughout the Sunnyside District, the Horse Canyon Mine area, and in the area of the proposed Lila Canyon Extension to the Horse Canyon Mine. For many of these faults, stratigraphic separation is greatest at the Book Cliffs escarpment and decreases eastward. These faults have vertical offsets of 15 to more than 275 feet and divide the Lila Canyon Extension into several large blocks that vary from 3,000 to 12,000 feet in width. These faults have not been mapped east of Patmos Ridge, indicating either formation before deposition of the Colton Formation, decreasing offset from deeper to shallower strata, decreasing offset to the east, or any combination of these.

Ground water was monitored within the Horse Canyon mine in several locations (Horse Canyon MRP - Appendix VI-I; B# 003537-003565). Generally, the small flows issued from rock slopes and gob areas (Lila Extension PAP, page 11 of Chapter 7; B# 005345). Records do not indicate that these flows were excessive or sustained (Lila Extension PAP, page 11 of Chapter 6; B# 005167). Unless a major fault is encountered, inflows of ground water into mines in the Book Cliffs Coal Field are small and decrease rapidly, indicating perched, isolated

BOOK CLIFFS AREA

sources. Geneva Mine records indicate that the mine was essentially dry until the Sunnyside Fault was intercepted, at which time water flows were encountered (Page 11 of Chapter 7; B# 005345). The plan for the Lila Canyon Extension is to avoid the Sunnyside Fault (Lila Extension PAP, Plates 5-3 and 6-1; B# 005141 and 005326).

The CIA boundary follows Patmos Ridge, which is as close as 1,600 feet to the Lila permit area boundary at one point, and as close as 5,000 feet to projected mine workings at another. In the absence of contravening information or data, it is acceptable to infer a ground water divide in shallow ground-water system that is coincident with a topographic feature such as Patmos Ridge. As discussed above, dip of the strata in this area are not a major influence on ground-water flow in the shallow, perched aquifers, and there is no evidence that any force other than gravity provides the gradient to drive ground-water flow in this region. If there is a separate ground-water divide for the deeper saturated zones, such as the Blackhawk, it is most likely east of Range Creek - beneath the main body of the Roan Cliffs - and ground water in this deeper system would flow toward the Book Cliffs and the Price River rather than away from them, and would flow under the perched local systems that sustain the springs in Little Park Wash; this is shown conceptually on Figure 12 (Page 57; see also Plate 1 of Osterwald and others, 1981; B# 006469).

The Division evaluated the potential of impacts and has determined that mining will not impact Range Creek in any way. Aquifers in the Colton Formation and undifferentiated North Horn Formation-Flagstaff Limestone will not be impacted because the aquitard characteristics, the amount of strata between these aquifers and the coal seam, and the sealing capacity of the formations will restrict vertical movement of water. Also, the impermeability of the undifferentiated North Horn Formation/Flagstaff Limestone aquitard and very low hydraulic conductivity in clays and siltstones in the Mesa Verde Group will prevent vertical movement from the deep zone upward to Range Creek. Also, ground water would have to travel a great distance, through very low-permeability rock to reach Range Creek, as shown by Osterwald, 1981, (Bates No. 6469, Geological Survey Professional Paper 1166, Plate 1).

SCOPE OF MINING

The Sunnyside coal-mining district of the Book Cliffs coal field, as defined by Osterwald (1981), includes the Horse Canyon Mine (also known as the Geneva Mine), the Sunnyside Mine, the Columbia Mine, and the Book Cliffs Mine. Only the Horse Canyon and Book Cliffs Mines (Plate 5-1 B# 005138) are in the CIA.

Horse Canyon Mine

Coal mining in Horse Canyon is thought to have begun in the late 1800's or early 1900's. Prior to that, Horse Canyon was used as a cattle trail. In 1936, the Cedar Ridge Coal Company was formed and operated a mine in Horse Canyon.

BOOK CLIFFS AREA

The Horse Canyon Mine was initially opened by the Defense Plant Corporation (a United States Government Agency) in 1942 as the source of metallurgical grade coal for the Geneva Steel Works in Orem, Utah. In December 1943, the Geneva Steel Company began operating the mine for the Defense Plant Corporation. On June 16, 1946, the mine was purchased from the War Assets Administration by United States Steel Corporation, and was operated by the Geneva Steel Company until January 1, 1952, when the Geneva Company became a part of the Columbia-Geneva Steel Division of United States Steel.

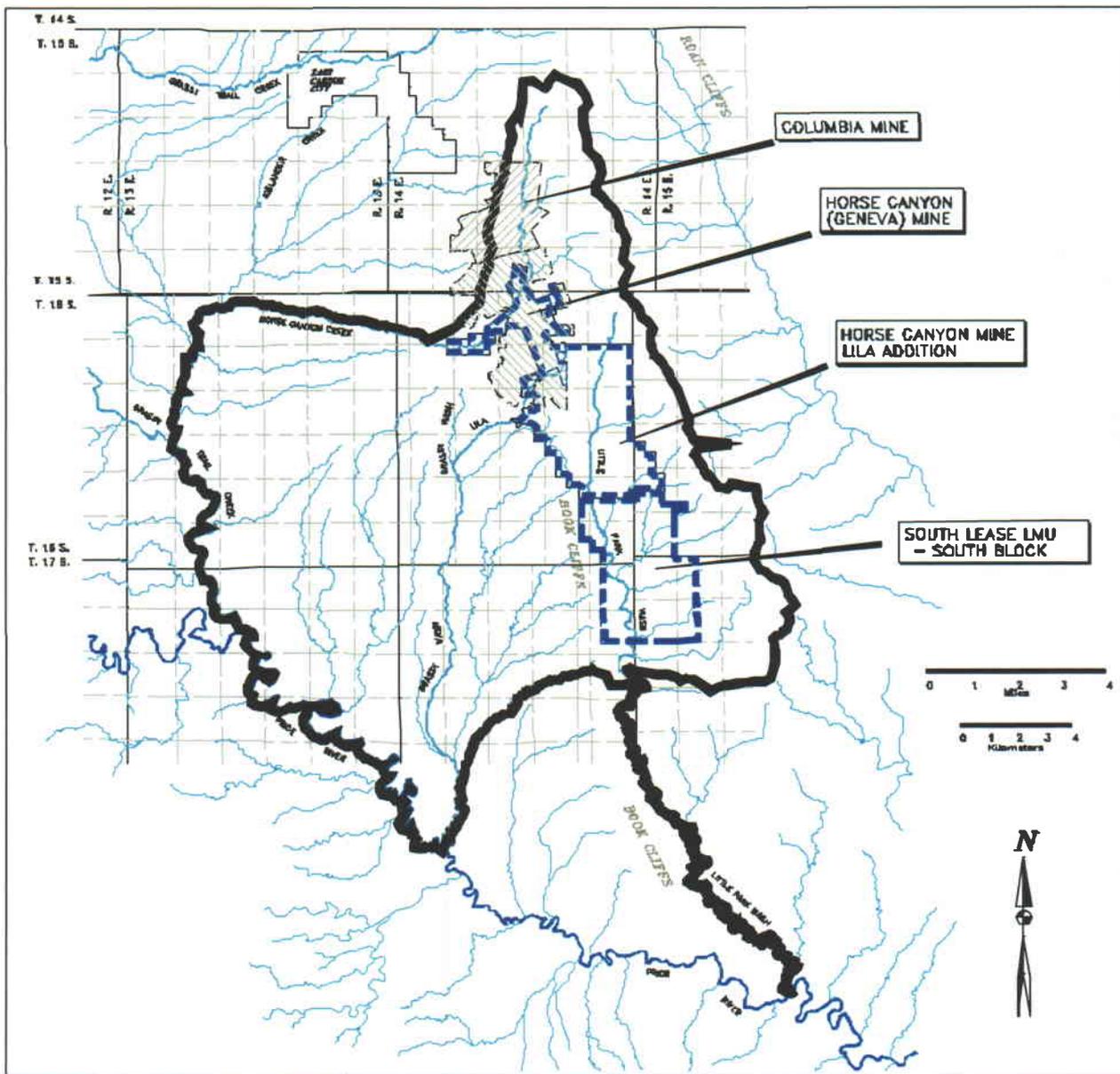


Figure 4 – Cumulative Impact Area (CIA)

In 1990, Intermountain Power Agency (IPA) acquired the Horse Canyon Mine and the areas south of Horse Canyon that had belonged to Kaiser Steel Corporation. UDOGM approved

BOOK CLIFFS AREA

transfer of the permit rights. During 1990 and 1991, IPA reclaimed the majority of the surface disturbance leaving only a main facilities pad with buildings essential for future mine operations. Phase I bond release was approved in 1997 and Phase II has **recently** been conditionally approved. Altogether, 3,500 acres in and adjacent to the current Horse Canyon Mine permit area were mined. There were eleven portals in the area, and all have been sealed.

UEI subleased six federal coal lease tracts from IPA in August 1998 and purchased them in 1999. These leases are part of the old Kaiser Steel Corporation's South Lease area - North Block LMU filed in 1996. There is additional federal coal south of the Horse Canyon permit area, which has been leased in the past as part of the South Lease LMU but is not currently under lease.

Plate 1 shows the extent of mining operations. The abandoned workings are approximately 3 miles in length and extend approximately 1 mile down-dip to the east. Overburden thickness was up to 2,000 feet. Mining was done in the Lower Sunnyside coal seam.

Book Cliffs Mine

The Book Cliffs Mine operated from 1938 to 1966. Coal was mined in the area between the Book Cliffs escarpment and the abandoned workings in the north part of the Horse Canyon Mine. The Prentiss, Utah Blue Diamond, Blue Diamond, and Heiner Mines were either alternative names for the Book Cliffs Mine or were smaller mines incorporated into it as it expanded.

Other

Doelling (1972) presented coal characteristics information from the area near Lila Canyon. Coal samples were collected near the site of the old Book Cliffs Mine from the lower Sunnyside Coal Seam. Coal characteristics are favorable for production, however overburden becomes extensive to the east and south of the proposed site.

III. HYDROLOGIC SYSTEM and BASELINE CONDITIONS

Elevations range from approximately 6,000 to over 9,000 feet in the CIA. Predominant features are cliffs, narrow canyons, valleys and pediments. Drainage in the CIA is characterized by a system of intermittent streams draining the southwest-facing Book Cliffs escarpment.

GEOLOGY

Plate 2 shows the surface geology of the Horse Canyon CIA. Faults, springs, and monitoring locations are also shown.

Stratigraphy

The stratigraphy of the CIA consists of strata ranging in age from Late Cretaceous to Tertiary (Eocene) as seen in Figure 5. There are no major disconformities in the area. The oldest exposed rocks include the upper members of the Mancos Shale. The Cretaceous Mesaverde Group, which in the Book Cliffs consists of the Star Point Sandstone, Blackhawk Formation, Castlegate Sandstone and Price River Formation, overlies the Mancos Shale: the Star Point Sandstone thins eastward and pinches out in the vicinity of the Dugout Canyon Mine so it is not present in the Horse Canyon area. Overlying the Mesaverde Group are the North Horn Formation, Flagstaff Limestone, Colton Formation, and Green River Formation, which in the Book Cliffs constitute the Wasatch Group of Paleocene to Eocene age. The Eocene Green River Formation is the uppermost consolidated formation in the vicinity of the CIA. Unconsolidated deposits formed by weathering and erosion exist as soils, terrace deposits, gravels along canyon streams, and pediments at the base of escarpments.

Coal

The Sunnyside Member of the Blackhawk Formation contains the primary economic coal resource in the Book Cliffs. The lowest coal seam is the Kenilworth. Doelling (1972) indicates an average thickness of 2 feet in the vicinity of Horse Canyon, with the seam probably missing in areas. The Gilson and Rock Canyon Seams that lie above the Kenilworth throughout much of the Book Cliffs coal field, and that are mined in the Dugout and Soldier Canyon Mines to the north, are not mentioned by Doelling or others for the Horse Canyon area and are either missing or very thin.

The Lower Sunnyside Seam is the only seam in the area that can be mined economically. In the abandoned sections of the Horse Canyon Mine, the Lower Sunnyside seam was uniformly 10 to 16 feet thick. Measurements indicate it is 4 to more than 18 feet thick in the Lila Canyon Project area: UEI has determined the Upper and Lower Seams are merged into one seam in the Lila Canyon area and split again into two seams to the south. Where separate from the Lower Seam, thickness of the Upper seam never exceeds 4 feet in the Lila Canyon Project area. Doelling states his expectation for the upper coal seams to be thin and inconsequential in this area.

BOOK CLIFFS AREA

In most of the Lila Canyon Project, the coal seam lies below 1,500 feet of strata. Mining will take place only in a small area where strata are greater than 2,500 feet above the Lower Sunnyside seam. Average overburden thickness is about 2,000 feet in the abandoned area of the Horse Canyon permit area.

Structure

Strata in the Book Cliffs were tilted in response to the rise of the San Rafael Swell and the Socally and Farnam anticlines, and modified by subsequent erosional, tectonic and orogenic events. Strike of the beds at the Horse Canyon Mine is roughly north-south, generally parallel to the face of the Book Cliffs. Dip is 6 to 12 degrees to the east at the Book Cliffs, but decreases eastward to as little as 4 degrees (Doelling, 1972).

Joints occur in two principal and two secondary orientations, although orientations are more accurately related to the local strike of the strata rather than to a specific direction. All joints tend to dip steeply. Retreat of the Book Cliffs escarpment has probably been facilitated significantly by blocks of rock breaking from the cliffs along joints, and soils and vegetative cover develop in large troughs formed as these blocks pull away. Northwest to north-northwest joints tend to be the most variable in orientation. They generally are parallel to strike of the strata and at right angles to the canyons and ridges of the escarpment. Locally they occur as little as 1 foot apart in zones a few feet wide, zones being a few feet to 20 feet apart. There has been vertical movement on some of these joints and some are coated with gypsum or calcite. Northeast to north-northeast joints are generally normal to the northwest to north-northwest joints and tend to be parallel to dip. The secondary joint sets trend west-northwest and northeast (Osterwald and others, 1981, p. 45).

The Sunnyside fault zone is a major north-northwest striking feature throughout much of the Sunnyside Mining District, extending from West Ridge to the Horse Canyon Mine (Osterwald and others, 1981). Average stratigraphic separation is 30 feet at Sunnyside and 40 to 60 feet at Horse Canyon, but offset on individual faults may be small. There has also been some horizontal displacement, but the amount is undetermined. Most faults within the zone are parallel to the trend of the zone. The faults dip steeply. Faults are detectable from surface mapping between West Ridge and upper Horse Canyon but not farther south. Extension of the Sunnyside Fault Zone south to the Horse Canyon Mine is uncertain, but it is believed to continue to the east of the Lila canyon addition.

Faults that strike basically east-west were mapped by Osterwald throughout the Sunnyside District, but they are more numerous in the Horse Canyon Mine area. Dips are generally vertical, but in the vicinity of Horse Canyon some of these faults dip 45° or less. For many of these faults, stratigraphic separation is greatest at the cliff-face and decreases eastward. Several additional faults with this orientation have been mapped in the area of the proposed Lila

BOOK CLIFFS AREA

System	Series	Stratigraphic Unit		Thickness (feet)	Description	
Tertiary	Eocene	Green River Formation		-	Greenish-gray and white claystone and shale, also contains fine-grained and thin-bedded sandstone. Shales often dark brown, containing carbonaceous matter. Full thickness not exposed.	
		Colton Formation	Wasatch Formation	300-2,000	Colton consist of brown and dark-red lenticular sandstone, shale, and siltstone, thins westwardly and considered a tongue of the Wasatch.	
	Flagstaff Limestone	3,000		Wasatch predominantly sandstone with interbedded red and green shales with basal conglomerate. Found in east part of field and equivalent to Colton and Flagstaff in west.		
	Paleocene	North Horn Formation	Tucher Formation	0 - 500	Flagstaff mainly gray and cream colored limestone, variegated shale, and fine-grained, reddish-brown sandstone.	
				350 - 2,500	North Horn Formation - Gray and gray-green calcareous and silty shale, tan to yellow-gray fine-grained sandstone, and minor conglomerate. Unit thickens to the west. Tucher Formation - Light gray to cream-white friable massive sandstone and subordinate buff to gray shale that exhibits light greenish cast. Contains minor conglomerate and probably represents lower part of North Horn, only present in east part of coal field.	
	Cretaceous	Danian			0 - 200	
		Maestrichthian	Price River Formation <i>MINOR COAL</i>		500 - 1,500	Yellow-gray to white medium-grained sandstone and shaley sandstone with gray to olive green shale. Contains carbonaceous shale with minor coal and thickens along east edge of field.
			Castlegate Formation <i>MINOR COAL</i>		100 - 500	White to gray, fine-grained sandstone, argillaceous massive resistant sandstone thinning eastwardly with subordinate shale. Carbonaceous east of Horse Canyon but coal is thin and lignitic.
		Campanian	Blackhawk Formation <i>MAJOR COAL SEAMS</i>		600 - 1,100	Cyclical littoral and lagoonal deposits with six major cycles. Littoral deposits mainly thick-bedded to massive cliff-forming yellow-gray, fine- to medium-grained sandstone, individual beds separated by gray shale. Lagoonal facies consist of thin- to thick-bedded yellow-gray sandstones, shaley sandstones, shale, and coal. Coal beds form basis of Book Cliffs coal field. Unit thins eastward, grading into the Mancos Shale.
			Star Point Sandstone		0 - 580	Yellow-gray, massive medium- to fine-grained littoral sandstone tongues projecting easterly, separated by gray marine shale tongues projecting westerly.
Santonian		Masuk Tongue	Mancos Shale	4,300 - 5,050	Gray marine shale, locally heavily charged with carbonaceous material, slightly calcareous and gypsiferous, nonresistant forming flat desert surfaces and rounded hills and badlands. Separated mainly to into tongues by westward projecting littoral; sandstone that eventually grade into shale. Sandstones are fine- to medium-grained, yellow-gray to tan, and medium-bedded to massive and cliff-forming.	
		Emery Sandstone				
Coniacian		Garley Canyon Sandstone				
		Blue Gate Shale				
Turonian		Ferron Sandstone <i>MINOR COAL</i>				
	Tununk Shale					
Cenomanian	Dakota Sandstone	2 - 126				Heterogeneous sandstone, conglomerate, and shale, thin resistant cuesta former.

Figure 5-General Stratigraphy of the Book Cliffs Coal Field (after Doelling, 1972)

BOOK CLIFFS AREA

Canyon Extension addition to the Horse Canyon Mine. These faults, which have vertical offsets of 15 to more than 275 feet, divide the Lila Canyon addition into several large blocks that vary from 3,000 to 12,000 feet in width.

Osterwald identified two other groups of faults that are not prominent in or around the Horse Canyon CIA. A group of east-northeast and northeast trending faults is located mainly in Whitmore Canyon near the Sunnyside Mine, and a belt of west-northwest trending faults that extends from the Book Cliffs out into the San Rafael Swell is located south of the Horse Canyon CIA.

HYDROLOGY

Ground water

The groundwater regime in the Lila Canyon Lease area consists of two different multi-layered zones. The upper zone, or Wasatch Group consists of the Colton Formation and undifferentiated Flagstaff Limestone-North Horn Formation: parts of the Wasatch Group are classified as an aquifer because different perched layers supply groundwater sources in sufficient quantities for a specific use (as specified by the definition for "aquifer" in R645-100-200) for cattle and wildlife. The Wasatch Group covers the eastern half of the Lila Canyon Extension area where it dips a little north of east. It produces low volume spring flows from up-dip exposures of bedrock and overlying alluvium. Some spring discharges from this shallow zone have been developed to supply water for livestock during the summer months, and it is assumed that the developed water is also used by wildlife.

The Mesa Verde Group consists of the Blackhawk Formation, Castlegate Sandstone and the Price River Formation. No formation or unit in the Mesa Verde Group are considered an aquifer as defined by the Utah Coal Regulations R645-100-200 because, although a considerable volume of water may be stored, the water is not developed for a specific use, the strata do not transmit ground water to supply any water sources, and the water has no potential to be used or developed, nor is it elemental to preserving the hydrologic balance in the permit and adjacent areas. It has no observable discharge points within the Lila Canyon Mine Extension or adjacent areas or down dip from those areas. It does not discharge along any faults or fractures or in adjacent canyons. It is underlain by the impermeable Mancos Shale. Although ground water in the Mesa Verde Group is overlain by perched aquifers in the upper Wasatch Group, these two saturated zones are separated by clay layers in the upper Blackhawk and Price River Formations and undifferentiated North Horn-Flagstaff formations which contain approximately 80 percent clays, siltstones, mudstones and shales, all highly restrictive to groundwater movement (Fisher and others, 1960).

Hydraulic conductivities indicate very low vertical movement within the Mesa Verde Group. It is common practice to use information from adjacent, analogous areas in evaluating or predicting conditions in a new area. Table 2 lists hydraulic conductivities and transmissivities in strata of the Mesa Verde Group at distant and nearby localities in the Carbon and Emery County

BOOK CLIFFS AREA

coal fields. The wide variability of these values is indicative of the variability of the depositional environments and lithologies. A similar range of permeabilities is expected at Lila Canyon because the depositional environments and lithologies are similar.

It would be very hard to monitor all of the hydrologic variables in a column of strata in the multiple layers of the Mesa Verde Group. The depositional environments occurred in an oscillating seaway. The beds consist of beach sands, stream channels, delta deposits, shales, mudstones and swamp environments. The beds can change quickly from one point to the next. The hydrologic characteristics of the beds can also change rapidly within, a few decameters, both vertically and horizontally.

The Mesa Verde Group is likely saturated in the perched zones in some areas away from the escarpments. Piezometers drilled into the coal seam yield a measured water level revealing a hydrostatic head in the coal zone. Saturation does not mean the groundwater is readily available. The texture of the formations and beds range from coarse sandstone to very-fine mudstone. Movement and storage of water in the formations is related to porosity and permeability of the beds. Lateral movement of groundwater is more likely than vertical movement, however any movement is very slow considering the tightness of the beds and that no discharge is occurring anywhere.

In the CIA, the Blackhawk Formation, Castlegate Sandstone, Price River Formation, North Horn Formation, Flagstaff Limestone, Colton Formation and Quaternary deposits all contain potential reservoirs or conduits for ground water. Reservoir lithologies are predominately sandstone and limestone. Sandstone reservoirs occur where there is sufficient intergranular porosity and permeability in lenticular fluvial-channel and tabular overbank deposits, whereas limestone reservoirs have developed through dissolution and fracturing of tabular lacustrine deposits. Shale, siltstone, and cemented sandstone beds act as aquatards or aquacludes to impede ground-water movement. The Mancos Shale is a regional aquaclude that limits downward flow. More localized aquatards occur within the North Horn, Price River, Castlegate and Blackhawk Formations. Ground water in the CIA, as is typical of ground water throughout the Price River basin, occurs under both confined and unconfined conditions.

Recharge in the Wasatch Plateau and Book Cliffs coal fields has been estimated to be 3 to 8 % (Danielson and Sylla, 1983) and 9 % (Waddell and others, 1986) of the average annual precipitation. Snowmelt provides most of the ground-water recharge. In the Book Cliffs the recharge rate is generally greatest where limestones of the Flagstaff Formation are exposed as dip-slopes at the higher elevations. The Flagstaff is thin and not exposed on dip slopes in the West Ridge CIA just to the north, and thins and interfingers with the North Horn and Colton Formations to the south, in the Horse Canyon area (p. 22 and Plate 2 in Osterwald and others, 1981).

Ground-water quality varies greatly, depending on geology, physiography, and elevation. Waddell and others (1986) indicate that TDS concentrations range from 250 to 2,000 mg/L in the Book Cliffs area. The best quality occurs in or near mountain recharge areas and the poorest quality in lowland areas. The chemical characteristics of the ground water vary vertically from

BOOK CLIFFS AREA

formation-to-formation and areally within each formation. TDS in water from the Flagstaff Limestone ranges from 250 to 500 mg/L, whereas TDS in the Blackhawk and North Horn Formations range from 500 to 2,000 mg/L. The principal chemical constituents in Flagstaff water are calcium and bicarbonate. Water from the Blackhawk is of variable chemical composition with no single dominant cation or anion. Where dissolved solids concentrations of water in the Blackhawk are affected by Mancos Shale, sulfates of sodium and magnesium increase significantly: Mundorff (1972) and Waddell (and others, 1986) reported that water from two springs that issue near the contact between the Blackhawk Formation and the Mancos Shale have specific conductances that indicate TDS concentrations of 1,600 and 2,000 mg/L, respectively.

Water samples collected from several locations inside the Sunnyside Mine, in particular sumps, consistently had TDS levels in excess of 1,200 mg/L. Many of the samples from areas other than sumps had better quality water with TDS levels between 400 to 800 mg/L, which is probably more representative of the ground water that was flowing into the mines. TDS levels in drill hole DH-86-1 were also in the 400 to 800 mg/L range, but 15 of 17 samples from DH-86-1 were above 1,200 mg/L TDS. Waters from springs SP-6, SP-8, and PC-1 also are high in TDS.

Saturation indexes indicate that most ground waters are at saturation with respect to calcite. Ground waters are generally under saturated with respect to dolomite, gypsum, and anhydrite (Waddell and others, 1986).

Once recharge enters the ground, the rate and direction of ground-water flow is governed mainly by gravity and geology. Lateral ground-water flow dominates in the gently-dipping Tertiary and Cretaceous strata of the Book Cliffs, where layers of low-permeability rock impede downward movement of precipitation and ground water that has seeped into the ground.

Permeabilities and hydraulic conductivities of strata have not been measured above the proposed minesite, however reports produced by the USGS and other mining companies indicate that low hydraulic conductivities can be expected in the strata to restrict ground-water movement (Table 1).

A discussion of the type of hydraulic conductivities that will be found in the Sunnyside Sandstone below the coal seam is indicated in the following paragraph, from the Soldier Canyon CHIA.

In August 1986 bore holes SC-11G, SC-12G, SC-13G were drilled from the Rock Canyon Seam workings of the Soldier Canyon Mine down through the Gilson Seam and a 13- to 20-foot thick, clean sandstone located approximately 40 to 50 feet below the Gilson Seam. Hydraulic conductivities of 2×10^{-7} to 10^{-6} cm/sec were measured in SC-11G and SC-13G, but hydraulic conductivity was 1.5×10^{-3} cm/sec in SC-12G. The tests measured the hydraulic conductivity of the entire stratigraphic sequence. Ground water was under confined conditions in all three bore holes, but in SC-12G the measured head was 250 feet above the floor of the mine and water flowed into the mine until the hole was capped. The gradient determined from the three bore holes was 1,800 ft/mile (approximately 12°) in a

BOOK CLIFFS AREA

direction N 11° E. Even assuming the bore holes measured the hydraulic properties of the same stratigraphic sequence at three different locations, the range of hydraulic conductivities shows great inhomogeneity and the true potentiometric surface is almost certainly not planar with a uniform dip to the north-northeast. No further measurements have been reported for these wells and they are no longer usable as far as is known. Information on these three bore holes, including driller's logs, is in Appendix 7-I of the Soldier Canyon Mine MRP.

Table 1

**HYDRAULIC PROPERTIES of STRATA in the
WASATCH and BOOK CLIFFS COAL FIELDS, UTAH**

SOURCE		FORMATION			
		Price River	Castlegate	Blackhawk	Star Point
Soldier Cyn Mine	SC-11G			2×10^{-7} cm/sec*	
	SC-12G			1.5×10^{-3} cm/sec	
	SC-13G			10^{-6} cm/sec	
USGS (Wadde II, 1986)	G95.5	7.5×10^{-4} cm ² /sec**			
	G93.5		2.1×10^{-3} cm ² /sec		
	G100.4		3.2×10^{-5} cm ² /sec		
USGS (Lines, 1985)	(D-17-6) 27bda-1 Horizontal			5.3×10^{-6} cm/sec (ss)	
				3.3×10^{-11} cm/sec(silt)	
				3.9×10^{-6} cm/sec (ss)	
				3.9×10^{-12} cm/sec(shale)	
				7.0×10^{-11} cm/sec(silt)	
					1.1×10^{-3} cm/sec(ss)
					5.3×10^{-6} cm/sec(ss)
	(D-17-6) 27bda-1 Vertical			1.3×10^{-6} cm/sec (ss)	
				4.2×10^{-11} cm/sec(silt)	
				1.4×10^{-6} cm/sec (ss)	
				not measured	
				7.8×10^{-10} cm/sec(silt)	
					3.9×10^{-6} cm/sec(ss)
					2.3×10^{-6} cm/sec(ss)

* cm/sec = hydraulic conductivity

** cm²/sec = transmissivity

BOOK CLIFFS AREA

Hydraulic conductivities for some strata above the coal seam are also portrayed in a report by Lines, 1985 from the Trail Mountain Mine area. The report reveals that clay seams in the matrix actively inhibit vertical movement of ground water.

Both lateral and vertical flow may be channeled through faults and fractures, but plastic or swelling clays that can seal faults and fractures are abundant (Figure 6). Typically, ground-water flow in the Book Cliffs continues both laterally and downward until it intercepts the surface and is discharged as a spring or seep, enters a stream as baseflow, is transpired by vegetation, or simply evaporates. Ground water tends to flow more readily through shallower systems because the hydraulic conductivities are commonly larger than those of deeper systems, but some of the ground water will follow slower, deeper flow-paths.

Generally springs in the Book Cliffs and Wasatch Plateau coal fields are associated with contacts between zones or strata of differing permeability, such as at the base of sandstone lenses in the Colton and Green River Formations or fractured limestone beds in the Flagstaff and tight mudstones of the North Horn Formations (Osterwald and others, 1981). In many areas, such as the Soldier and Dugout Canyon area northwest of Horse Canyon, the contact between the Flagstaff Limestone and the North Horn Formation is the preferred location for springs; however, in the West Ridge and Horse Canyon CIAs there are only a few springs at this contact because the Flagstaff Formation is thin or absent and the contact between the Flagstaff Limestone and North Horn Formations is transitional (Osterwald and others, 1981), and in addition the overlying Colton Formation is relatively thick.

~~Springs were inventoried for baseline water quality and quantity information on and adjacent to the proposed Lila Canyon mining operation.~~ The permittee submitted an inventory of 83 seeps and springs in and adjacent to the Lila Canyon Extension (Plate 1). From those 83 springs and seeps, the Division relied on water quality and quantity information from 53 to characterize the hydrologic regime in and adjacent to the permit area; the other springs were not considered useful because of location and lack of relevance to the permit extension. Five of the 53 springs have been selected for operational monitoring.

Plate 1 indicates numerous springs, however, many of the springs flow only a short period with very low flow. The paucity of perennial springs in the area results from both the geologic characteristics and arid climate. There are no perennial water sources at the base of the Book Cliffs escarpment near the proposed Lila Canyon surface facilities. Redding Spring, RS-2, is the lowest and only continuous source in Horse Canyon on the escarpment side. It flows from the Lower Sunnyside Coal Seam at a rate of about of 6-10 gallons per minute (gpm) throughout the year. Spring sources on the proposed Lila Canyon Significant Revision are located on top of the escarpment.

Except for L-10-G, the springs on and adjacent to the proposed permit area appear to be associated with the lower unit of the Colton Formation, and not related to any of the fault systems on the permit area. These springs appear to be associated with separate sandstone units within the formation.

BOOK CLIFFS AREA

On July 2, 2001 a spring survey was conducted that included springs L-9-G and L-7-G. The main channel of Little Park Wash and its tributary channels are typically dry (Figure 7). The survey team drove 4-wheel vehicles up a tributary to Little Park Wash to access Spring L-7-G. The spring flowed about 2 gpm and had a specific conductance of 789 micromhos and a temperature of 56 degrees F.



Figure 6 This figure shows the distinct change and variability of bedding in the Blackhawk Formation above the coal seam. Water can be found in some fractures and sandstone units, but vertical movement of ground water can be restricted.

Spring L-9-G is accessed through a narrow draw, accessible by vehicle only in the lower part. The survey team hiked up the draw and eventually ran into wet alluvium. 100 meters farther up the draw there was a small flow in the channel, and flow was 5 gpm at Spring L-9-G

BOOK CLIFFS AREA

(Figure 8). We hiked up the channel from spring L-9-G and located a similar springsite and flow situation only with less flow. Flow along the channel was discontinuous downstream of the springs: flows were observed where bedrock was exposed in the channel and were reduced when alluvial gravels filled the channel.

Temperatures for the springs monitored July 2, 2001 ranged in the high 50's. Specific Conductance was between 700 to 780 micromhos, indicating relatively good water.

Most of the springs on the escarpment are ~~about 1,000 feet from the summit or~~ within a mile of the ridgeline that divides Little Park Wash from Range Creek Canyon; this ridge is a southern continuation of Patmos Ridge, a western extension of the Roan Cliffs (Van Cott, 1990; Osterwald and others, 1981). The stratigraphy in this area consists of the Upper Colton Formation, which is the recharge zone for the springs. The Colton Formation is a multi-layered formation having very low hydraulic conductivity¹ in some of the strata. It consists of interbedded siltstones, sandstones and mudstones deposited in a terrestrial/paludal environment. The limited recharge area and low hydraulic conductivities of the same rock units within the Colton Formation account for the very low volumes of discharge from the springs.



Figure 7. Tributary to Little Park Wash. Typical dry wash in Little Park Wash drainage.

The Flagstaff Limestone underlies the Colton Formation. The Flagstaff Limestone is the ground-water (spring) producing formation near Soldier Canyon, northwest of the proposed Lila

¹ Hydraulic Conductivity replaces the term "coefficient of permeability" and should be used in referring to the water transmitting characteristics of material in quantitative terms, or the ability of rock to transmit water, 1989, Heath, Ralph C., U.S. Geologic Survey Water Supply Paper 2220.

BOOK CLIFFS AREA

Canyon Extension Mine. The fracture system that is usually associated with the limestone forms good conduits for transmitting ground water. As ground water flows through the Flagstaff Limestone it comes in contact with interbedded mudstones and shales of the North Horn Formation, which act as an aquatard, so that springs often form near the contact.



Figure 8. Watering trough at Spring L-9-G. Spring emanates in channel above fence. Water is diverted into a plastic pipe and into the trough. Spring was measured a 2 gpm.

The surface extent of Flagstaff Limestone is not well exposed on the permit area. Spring L-10-G flows from the Flagstaff Limestone where there is more surface exposure of the formation and more recharge surface.

The springs are, vertically, about 1,000~~2,000~~ to 2,400 feet above the coal seam to be mined (Table 2). It is very unlikely that subsidence or subsidence fractures would reach the spring or recharge sources to cause any impacts. It has been presented in other mine plans by mine operators and their consultants that shale layers in overlying formations tend to swell and seal any fractures that are created by subsidence, especially when they are exposed to groundwater sources: although this has not been confirmed through controlled studies or observations, experience at numerous mines indicates it is a valid conclusion. This swelling and sealing phenomenon would restrict movement of water through conduits created by subsidence, and provide an explanation of why most water intercepted during mining gradually slows over time.

Table 2
Elevation of Lower Sunnyside Coal Seam, Spring Resources, and Thickness of Strata

	SURFACE ELEVATION	COAL ELEVATION	OVERLYING STRATA THICKNESS	COVER THICKNESS from PLATE 6-3
L-6-G / H-18	7500	5700	1800	
L-7-G	7400	4900	2500	2400
L-8-G	7400	5000	2400	2000+
L-9-G	7300	5000	2300	2000
L-10-G	6700	5500	1200	1250
L-11-G / H-18-A	7500	5600	1900	
L-12-G / 11	6750	5600	1150	1000+
IPA-1	7034	5379	1655	1750
IPA-2	6865	5895	970	1100
IPA-3	6810	5764	1046	1100
RS-2	6600			

Plate 1 shows locations for all springs, streams and surface-water monitoring sites, ~~bore holes~~, and ~~ground-water monitoring wells~~ piezometers. Initially, the permittee submitted an inventory of 83 seeps and springs in and adjacent to the Lila Canyon Extension. After analyzing locational, quality and quantity data from those 83 springs and seeps, the Division chose and relied on water quality and quantity information from 53 of those to characterize the hydrologic regime in and adjacent to the permit area. The other 30 springs were deemed extraneous because of location and lack of relevance to the permit extension. Five of the 53 springs and three piezometers, the potential mine-discharge site, the sedimentation pond discharge, and three other surface monitoring sites were further selected for operational monitoring. Two additional sites, L-11-G and L-12-G, were identified for the operational monitoring plan after mining operations begin. The inset provides identification of the sites used by the operator of the Horse Canyon Mine for monitoring baseline and operational data.

Three ~~piezometers~~ wells, IPA-1, IPA-2 and IPA-3, are used to monitor ground-water levels deep within the Blackhawk Formation at the coal seam. The wells were originally drilled in 1991 to assess the thickness and quality of the coal, so they are not much deeper than the lower Sunnyside Coal bed. The ~~piezometers~~ wells were cased and perforated to allow water levels in the coal seam to seek hydrostatic levels. Because water levels have been measured in the ~~piezometers~~ wells and ground water has been contacted in other mines in the Book Cliffs, it is expected that development of the proposed Lila Canyon ~~Extension Mine~~ will also produce minewater. The operator has made plans to use, store and treat any ground water intercepted in the mine and to ensure it meets Utah Pollutant Elimination Discharge Standards before any water is discharged from the mine.

Water levels were measured in the ~~piezometers~~ wells 1994, ~~through 1995, and~~ 1996. There was a hiatus in monitoring after 1996 until late 2000 when UEI put more emphasis on obtaining a mining permit for the proposed Lila Canyon ~~Extension Mine~~. These ~~piezometers~~

BOOK CLIFFS AREA

~~wells~~ were again used to measure water levels in 2000 and 2001 and are included in the Lila – Horse Canyon Mine operational water-monitoring plan.

Water depth could be measured only at IPA –2 when the consultant working for UEI monitored the ~~piezometers wells~~ in December 2000. In IPA- 2, the measured depth was 899 feet from the surface, which closely matched the levels taken at the same ~~piezometer well~~ in 1994-1996.

Levels were measured in all three ~~piezometers wells~~ in May 2001. Depths in wells IPA-2 and IPA-3, respectively 901 and 839 feet, were similar to earlier measurements. IPA-1 has shown a steady rise (decrease in depth) over the years, from 1,134 in July 1994 to 1,128 in April 1996 to 1,114 in May 2001. IPA-2 and IPA-3 are in the same fault block, and their almost static levels are a good indication of stability in the aquifer of this area.

The rise in water level at IPA-1 is not completely understood. A fault separates IPA-1 from the other two ~~piezometers wells~~, and the throw on the fault ranges about 50 feet up on the north block at the western end of the fault to an unknown displacement on the eastern end. The bedding dips to the northeast. The Horse Canyon Mine is over a mile to the north, ~~but an~~ ~~An~~ exploration tunnel that was developed for the mine (1957 to 1962) was driven south through Section 14, a mile west of IPA-1. It is not known if water was intercepted during the development of this tunnel or if it has any connection with the rise of the water level in the ~~piezometer well~~. ~~More water monitoring of this well is recommended to track the future trend of the well.~~ Other possible factors producing this slow rise could be:

A leaky annular seal that is allowing surface water to reach the monitored zone and slowly raise the water level;

Very low hydraulic conductivity in the surrounding rock so that the water level in the bore hole has not yet reached equilibrium; and

Debris, damaged screen or other well construction factors that have delayed the water level in the borehole from reaching equilibrium.

Mining may eventually undermine these IPA ~~piezometers monitoring wells~~ and render them useless, but combining information from these ~~piezometers wells~~ with monitoring of flows in to the mine and mine discharges will provide a good picture of the effect mining is having on ~~the deep saturated zones near the coal seam ground water levels.~~

Most water entering mines in the Wasatch Plateau and Book Cliffs coal fields comes through leaks in the mine roof as water in storage in the interstices of the rock matrix seeps into the mine. The amount of ground water that is contacted depends on the porosity and permeability of the surrounding rock that is penetrated during mining. Sometimes mining intersects faults that produce in-mine flows.

BOOK CLIFFS AREA

Historically, minewater has been discharged from the nearby Soldier Canyon, Sunnyside and Horse Canyon Mines. Some discharges have been as high as several hundred gallons per minute. This information provides a basis for expecting mine water discharge from the proposed Lila Canyon Extension Mine.

UEI has not conceded or admitted an expectation of discharging mine water, although they have made provisions for mine water discharge at the behest of UDOGM. UEI based their no discharge claim on water levels in the ~~piezometers ground-water monitoring wells~~ and those levels related to coal seam elevation, Figure 7-1 in the Mining and Reclamation Plan. The highest water levels measured (which is the head of water in the lower Sunnyside Coal seam) is 5,972 feet (elevation) in Well IPA-3. The elevation of projected interception of the coal seam with the rock slope tunnel is 6,300 feet, 338 feet higher than water in IPA-3. Dip is 12 % to the east-northeast. UEI expects hydraulic conductivities to be very low in this area, and plans to use any water encountered during mining in coal production and will store excess water in sumps.

Calculations by UDOGM indicate that the mine will extend down dip 3,530 feet from the tunnel intercept before the water table is contacted. Mine plans indicate that, if needed, any minewater discharges would be pumped from the mine via the coal loadout entry, then transported through a pipe to the ephemeral Lila Canyon channel, a tributary to Grassy Trail Creek. Before minewater discharges take place, UEI will obtain a discharge permit through the Utah Pollutant Discharge Elimination System (UPDES) and submit plans to UDOGM to ensure channel protection. UEI states that channel mapping and analysis will be conducted prior to any discharges to ensure protection of channel morphology.

Surface Water

The Horse Canyon CIA is situated in the Book Cliffs, about halfway between the headwaters of the Price River and its confluence with the Green River (Figure 3). Many streams that originate in the Book Cliffs are perennial at higher altitudes but become ephemeral as they emerge from the mountains and flow onto the lowlands (p. 7 in Waddell and others, 1981). The CIA is drained by the Horse Canyon, Lila Canyon, and Little Park Wash drainages. When flows from these intermittent drainages are large enough, they eventually reach the Price River, a perennial stream. Water from Horse Canyon flows to the Price River by way of Icelander and Grassy Trail Creeks, while that from Lila Canyon Creek flows southwest then south to the Price River by way of Grassy and Marsh Flat Washes. Little Park Wash flows south, where its waters pass through a short stretch of Trail Canyon before reaching the Price River. The Price River flows into the Green River about 40 miles southeast of the mines. The Green River flows southward from its confluence with the Price River approximately 75 miles until it discharges into the Colorado River.

Flow in the Price River is regulated at Scofield Reservoir, and discharge is measured at several locations both upstream and downstream of the confluences with Deadman, Coal, Soldier, and Grassy Trail Creeks. The area of the Price River drainage is 455 miles² above USGS gauging station 09313000 near Helper, and 1,540 miles² above USGS streamflow gauging station 09314500 near Woodside, about 10 miles below the confluence with Grassy Trail Creek.

BOOK CLIFFS AREA

Between these two stations water is taken from the river and its tributaries for irrigation.

As of 1997, USGS water discharge data are available for station 093143000 for water years 1934 to 1969, 1979 to 1981, and 1990 to 1996. Records are fair except for estimated daily discharges, which are poor.² Extreme flows recorded were 9,340 cfs on September 13, 1940 and 0.4 cfs on August 21, 1961. The mean annual flow volume for the three periods of record is 110 cfs or 80,000 ac-ft/year.

USGS water discharge data are available for station 09314500 for water years 1909 to 1911 and 1945 to 1992. Records are fair except for estimated daily discharges, which are poor. Maximum-recorded discharge was 11,200 cfs on September 7, 1991. Periods of no flow were recorded in 1960, 1961, 1963, and 1992. The mean annual flow volume (1947 to 1992) was 121 cfs or 88,000 ac-ft/year. Limited water quality data are available for 1946 to 1949, 1951 to 1988, and 1991 to 1996.

Discharge of the Green River has been measured at USGS gauging station 09315000 at Green River, Utah, about 12 miles below the confluence of the Price and Green Rivers (Figure 2). For water years 1894 to 1899 and 1904 to 1996 flow ranged from a minimum of 255 cfs on November 26, 1931 to a maximum of 68,100 cfs on June 27, 1917. Average annual discharge is 6,192 cfs or 4,484,000 ac-ft/year. Records are good except for estimated daily discharges, which are poor. Water quality data are available for 1928 to 1996 (Table 3).

Snowmelt is the major source of water for the streams of the Price River basin. Intermittent and ephemeral streams are abundant, existing primarily at lower elevations where potential evapotranspiration exceeds precipitation. Intense summer thunderstorms may cause short-term flooding but not large volumes of runoff.

Water use in the higher elevations of the Price River basin is primarily for wildlife and stock watering purposes. The upper watershed provides most of the domestic water needs for the lower valley. Within the lower valley area, agricultural activities utilize some of the water (Mundorff, 1972). Minimum flows in the gauged streams and rivers in the basin occasionally reach zero. Storage reservoirs are common at higher elevations.

In general the quality of water in the headwaters of the Price River basin is excellent. Waddell and others (1981) report that the Price River and its tributaries generally have a TDS concentration of between 250 to 500 mg/L upstream from Helper, and the water type in this area is calcium bicarbonate. However, the quality of water in the Price River rapidly deteriorates down gradient. Below the town of Helper most flows originate on Mancos Shale or are irrigation return flows from lands situated on Mancos-derived soils (Price and Waddell, 1973). The Price River near the confluence with Soldier Creek has an average TDS content of about

² "Good" means about 95 % of reported daily discharges are within 10 % of the actual discharge, "fair" means within 15 %, "poor" means reported values have less than "fair" accuracy. Accuracy is based on 1) the stability of the stage-discharge relationship or, if the control is unstable, the frequency of discharge measurements; and 2) the accuracy of observations of stage, measurements of discharge, and interpretation of records.

BOOK CLIFFS AREA

1,700 mg/L, including sulfates of calcium, magnesium and sodium. At USGS station 09314500, the weighted average TDS content is between 2,000 and 4,000 mg/L, with the water type being strongly sodium sulfate (Mundorff, 1972).

Soil cover varies with slope, with bare sandstone cliffs along the upper portions of the canyons, shallow silty soils on the milder slopes, and shallow sand-gravel alluvium in the channel bottoms. Soils in the CIA are dominantly in hydrologic soils groups B to D (Wilson, 1975), having infiltration rates that are moderate to very slow.

The average annual sediment yield is 0.5 to 1.0 ac-ft/mile²/yr across most of the CIA, so the estimated average annual sediment yield of the Horse Canyon CIA is 57 to 114 ac-ft/yr for undisturbed conditions. (The expected sediment yield from the Lila mine disturbed area is 0.3090 ac-ft/yr.) The higher elevations of the Book Cliffs, where limestone and dolomite are exposed on steep slopes, have the lowest sediment yield, 0.1 to 0.2 ac-ft/mile²/yr. On lower, flat areas developed on the more erodible sandstones and shales of the Mancos Shale, sediment yield is 0.5 to 3.0 ac-ft/mile²/yr (Waddell and others, 1981, Plate 6).

The surface water drainages within the Lila Canyon permit area consist of three channels; Little Park Wash, and Lila Canyon Wash (North Fork of Coleman Wash) and the South Fork of Coleman Wash. Little Park Wash trends southward to Trail Canyon and the Price River. Little Park Wash runs across the Colton Formation and undifferentiated North Horn-Flagstaff formations in the upper reaches of the channel and across the mine permit area above the Book Cliffs. All the drainages flow only in response to snowmelt during the spring or as a result of isolated summer thunderstorms. Due to the limited drainage area and elevation of Lila Canyon, the duration of the snowmelt flows is quite short and is limited to the very early spring. Locations of all baseline data points are shown on Plate 7-1, Bates No. 00659. There are no streams, lakes or ponds or irrigation ditches known to exist within the proposed Lila Canyon permit area. Lila Canyon Wash and the South Fork of Coleman Wash, drain southwest to Grassy Wash. It in turn drains southward to the Price River. (See Plate 7-1)

Regulation R645-100 identifies a **perennial stream** as a "stream that flows continuously during all the calendar year as a result of groundwater discharge or surface runoff." There are no perennial streams on or immediately adjacent to the permit area. An **intermittent stream** is defined as "(a) a stream or reach of stream that drains a watershed of at least one square mile or (b) a stream, or reach of a stream, that is below the water table for at least part of the year and obtains a flow and obtains its flow from both surface runoff and groundwater discharge. An **ephemeral stream** is defined as, "a stream that flows only in direct response to precipitation in the immediate watershed or in response to melting of a cover of snow and ice and which has a channel bottom is always above the local water table.

Little Park Wash and Lila Canyon wash meet the classification for intermittent stream because they are over one square mile in area. These washes also meet the classification for ephemeral stream channels, which flow in direct response to precipitation. The Division believes that these two drainages are best defined as ephemeral because these are characteristically dry. The operator states on page 14, MRP, Bates no. 5348, both Lila Canyon

BOOK CLIFFS AREA

Wash and Little Park Wash have been observed numerous times, July 1999 to July 2001, at least quarterly for the past two years and no flow was noted.

The applicant submitted data on selected springs, L-6-G, Bates No. 5558 and 5542; L-7-G, Bates 5559 and 5462; L-8-G, Bates No. 5560 and 5566; L-9-G, Bates No. 5561 and 5504 and L-10-G, Bates No. 5562 and 5492, Table A) which reflects the groundwater hydrology baseline conditions and water table above the stream channel for each perched aquifer (upper groundwater zone). The springs generally flow in the upper small reaches at low rates, which wet the upper reaches of the stream channel for less than a hundred feet. During most of the summer and fall the main channels down gradient of the springs are dry.

The type of stream channel is important in evaluating and predicting the types of impacts induced by mining, and whether reclamation, if the stream channel is disrupted, is feasible. The types of impacts from mining that could affect Little Park Wash and Lila Canyon Wash could be water quality degradation. Only Little Park Wash has the potential of being affected by subsidence, the area near Lila Canyon Wash has already been mined by past mining in the Horse Canyon Mine (Plate 5-1, MRP). Subsidence can be allowed within 100 feet of an intermittent stream if renewable resource lands are not impacted, R645-301-525.

The permit application included a survey that shows whether structures and renewable resource lands exist within the proposed permit area and adjacent area and whether subsidence, if it occurred, could cause material damage and diminution of reasonably foreseeable use of such structures or renewable resource lands.

"**Renewable Resource Lands**" means aquifers and areas for the recharge of aquifers and other underground waters, areas for agricultural or silvicultural production of food and fiber, and grazing lands. For the purposes of R645-103, RENEWABLE RESOURCE LANDS means geographic areas that contribute significantly to the long-range productivity of water supply or of food or fiber products, such lands to include aquifers and aquifer recharge areas

Regulation R645-301-731-600 provides that the Division can make a finding to allow mining under an intermittent steam channel if:

- 731.600. Stream Buffer Zones.
- 731.610. No land within 100 feet of a perennial stream or an intermittent stream will be disturbed by coal mining and reclamation operations, unless the Division specifically authorizes coal mining and reclamation operations closer to, or through, such a stream. The Division may authorize such activities only upon finding that:
- 731.611. Coal mining and reclamation operations will not cause or contribute to the violation of applicable Utah or federal water quality standards and will not adversely affect the water quantity and quality or other environmental resources of the stream; and
- 731.612. If there will be a temporary or permanent stream channel diversion, it will comply with R645-301-742.300.

BOOK CLIFFS AREA

- 731.620. The area not to be disturbed will be designated as a buffer zone, and the operator will mark it as specified in R645-301-521.260.

In identifying whether impacts could affect the intermittent stream channels, it was evaluated whether the channels themselves are renewable resources. The definition of Renewable Resource Lands identifies the springs emanating from the Colton aquifers as renewable resources and they should be protected as the regulations allow. These particular channels do not contain a fishery or support aquatic life in the main channels. The main channels do not support riparian vegetation; the only riparian vegetation is near spring sources that supply the upper reaches for short distances. Stream channels are dynamic and are moving and adjusting to changes in the environment. The channel that directs the ephemeral type flows is a significant feature, but is not a renewable resource. Modifications to the channel could occur if the water resources are not impacted and adverse impacts to the channel could be mitigated. If any parts of the main channel were subsided, it can be mitigated. It is unlikely that water interception could occur, because the cover between the coal seam and the surface is extensive enough to prevent substantial deformation or fracturing.

Geologic information presented in the MRP shows that overlying strata between the coal seam and Little Park Wash ranges between 700 feet at the southern most mined area to 2500 feet to the north of the permit area. The overlying strata contain multiple interbedded sandstone and shale layers, yet the cover ranges from 700 feet at the cross cut to 1000 feet over the mine panel (Plate 5-3, MRP). The high amounts of clays, siltstones and mudstones in the layers below the channel alluvium would prevent or seal any potential fractures. The flow in the stream channels is zero. The high flows would carry high volumes of sediment that would fill any potential fractures. If subsidence should occur temporary ponding could take place. UEI can mitigate if it is found necessary. Ponding although not expected could provide a beneficial use water source to wildlife if it happens.

The potential for water quality impacts are not likely in any of the channels. No surface disturbance will take place in or adjacent to Little Park Wash. Although flows have not been sampled several USGS reports show that high volumes of runoff from adjacent areas contain high volumes of suspended and dissolved sediments, Waddell, 1981, USGS Professional Paper 2068.

It is the finding of this Division that subsidence will not impact the stream channels and that the applicant may conduct mining operations within 100 feet of the channels of Little Park Wash and Lila Canyon Wash (North Fork of Coleman Wash).

SURFACE WATER HYDROLOGY OF THE CIA

The Horse – Lila Canyon CIA covers approximately 73,000 acres. It includes the south side of the Horse Canyon drainage, the Lila Canyon drainage, the Little Park Wash upper drainage and the channel in lower Little Park Wash. Topography in the area is rugged, with elevations ranging from approximately 6,000 to over 9,000 feet. Slopes vary from vertical cliffs to less than 2 % along the ridges.

BOOK CLIFFS AREA

Water resources within or adjacent to the Horse – Lila Canyon CIA include a few low yielding springs and streams. There are no major water bodies located within or adjacent to the CIA. Typically, most of the total flow in the Book Cliffs is from snowmelt but highest flows are from thundershowers. Figure 9 shows monthly average flows for Grassy Trail Creek that typify the monthly variation of flow for streams draining the Book Cliffs.

Horse Canyon

No water flows from the Lila Canyon Extension area to the Horse Canyon drainage.

Horse Canyon originates at an altitude of approximately 9,600 feet and flows into Grassy Trail Creek. The USGS maintained gauging station 09314374 just below the Horse Canyon Mine during the 1979 to 1981 water years (USGS, 2001 and Price and Plantz, 1987). Area of the drainage above this station is 12.5 miles².

Horse Canyon is an intermittent stream at the gauging station. Measured streamflow was quite variable during the three water years the stream was measured and reflected intermittent discharge of water from the Horse Canyon Mine. Mean annual discharge at the gauging station was 170 gpm (0.4 ft³/sec) and discharge from the mine probably accounted for half of that, based on observations in 1979 by Lines and Plantz (1981). Snowmelt runoff peaked in April or May. Greatest daily discharge was 1080 gpm (2.4 ft³/sec) in May 1980; however, a storm in November 1979 produced a flow of 940 gpm (2.1 ft³)

Flow data from the Horse Canyon Mine operators show that in 1981 and 1982, flow below the mine was high, typically 300 to 500 gpm, but dropped to no-flow from 1989 on (no data for 1983 to 1988). Flows in the two forks above the mine site have been fairly consistent during and after mining. Flows in the forks have generally been low except in response to storms: 654 gpm was recorded in the Left Fork on May 1, 1993 but there was no-flow reported in the Right Fork and below the mine on that day.

The USGS performed three sets of base-flow measurements in Horse Canyon. In August and November 1978 the streambed was dry below the confluence of the North and South Forks, about two miles above the Horse Canyon Mine and on the Price River Formation. Flows measured farther downstream on all three days were mainly from mine discharge.

Water samples were collected and analyzed from August through September 1979 (Lines and Plantz, 1981) and during water years 1979 to 1981 (Price and Plantz, 1987). Most of the water sampled was discharged from the mine just upstream of the monitoring station. TDS averaged approximately 1,900 mg/L, with a low of 953 mg/L and a high of 4,220 mg/L. Sodium and sulfate were the main dissolved ions. Suspended sediment was measured in twenty-seven samples: concentrations ranged from 2 to 2,278 mg/L. Suspended-sediment discharge ranged from less than 0.01 to 2.0 tons/day and was greatest during spring snowmelt.

BOOK CLIFFS AREA

Benthic invertebrates were sampled during the summers of 1978 and 1979. The small diversity of organisms reflected the poor water quality and intermittent flow (Lines and Plantz, 1981).

Lila Canyon

Lila Canyon lies between Horse Canyon and Little Park Wash. It drains an area of approximately 2 miles² in the Book Cliffs. Flow is ~~ephemeral~~ ~~intermittent~~, and when flow from this canyon is sufficient it reaches the Price River by way of Grassy and Marsh Flat Washes.

Hydrologic information on Lila Canyon is sparse. As with other drainages in the area, runoff is limited to spring snowmelt and individual storm events. Because of the small size of Lila Canyon, flows from snowmelt are limited to early spring. In observations done at least quarterly since 1999 by UEI, no flow has been recorded in the Lila Canyon drainage, and no indications of perennial flow have been found anywhere in Lila Canyon.

Little Park Wash

Little Park Wash drains southward, behind and parallel to the Book Cliffs escarpment, and joins Trail Canyon for a short distance before the confluence with the Price River. As with most drainages in the Book Cliffs, runoff is limited to spring snowmelt and individual storm events.

Flow and water quality information on Little Park Wash is sparse: observations done at least quarterly since 1999 have found no flow. This is functionally an ephemeral stream. Some small springs exist in tributaries to Little Park Wash, but flows from these springs typically evaporate or are absorbed into the alluvium before reaching the main channel.

Grassy Trail Creek

Information is presented on Grassy Trail Creek that illustrates the characteristics, water quality and quantity along the Book Cliffs, even though the upper portion of Grassy Trail Creek is not part of the CIA. The headwaters of Grassy Trail Creek are in the area between the Book Cliffs and the Roan Cliffs (Plate 1), at altitudes ranging from approximately 7,000 to over 9,000. Whitmore Canyon, a steep, deep, narrow valley, has been eroded through Tertiary and Cretaceous strata. At the mouth of Whitmore Canyon, Grassy Trail Creek crosses a large alluvial fan, then meanders across a gently sloping plain on the Mancos Shale to its confluence with the Price River. Grassy Trail Creek is perennial in Whitmore Canyon to just below Grassy Trail Reservoir, but intermittent from the Sunnyside area to its confluence with the Price River. According to Mundorff (1972), Grassy Trail Creek has the largest drainage area of any tributary to the Price River.

The USGS measured discharge of Grassy Trail Creek for water years 1979 to 1985 at station 09314340 (USGS, 1998), located approximately half way between the town of Sunnyside and the Sunnyside Mine. Record quality was good. Grassy Trail Creek average daily mean

BOOK CLIFFS AREA

discharge for the seven-year period was 9.9 cfs (Figure 9). Maximum daily mean flow was 349 cfs on May 28, 1983 and maximum measured flow was 631 cfs on May 31, 1983. Minimum daily mean flow was 0.04 cfs on February 22, 1981, and no flow was observed at some time during the day on several days in February 1981.

Water quality was measured in up to 49 samples from station 09314340 during water years 1979 to 1984 (Price and Plantz, 1987). TDS ranged from 330 to 1,900 mg/L, with a mean value of 988 mg/L. In general, dominant cations were calcium and magnesium and dominant anions were bicarbonate and sulfate; however, there were seasonal variations that related directly to TDS, which was related to streamflow and mine discharges. In 12 samples analyzed for lead, maximum concentration was 55 μ g/L, which is above the Utah Division of Water Quality (UDWQ, 1994) criteria of 50 μ g/L for aquatic wildlife and domestic water sources. Eight samples were analyzed for mercury, with mercury concentrations ranging from below the detection limit of 0.1 μ g/L up to 1.4 μ g/L, which all fall below the UDWQ criteria of 2 μ g/L for Class 1C and 2.4 μ g/L for Classes 3A-3D waters; however, some exceeded the criteria for the protection of human health of 0.144 μ g/L.

Phenols come from natural organic sources but can also be indicators of polluting effluents from industrial processes, including coal mining. The limit for Class 1C waters for the protection of human health is 300 μ g/L, but for aquatic wildlife (Classes 3A-3D) the limit is only 10 μ g/L (UDWQ, 1994). For many species of fish, 5 μ g/L has been reported to be harmful (Waddell and others, 1981). Lines and Plantz (1981) reported levels of 0 to 2 μ g/L in six samples. The twenty phenol analyses reported by Price and Plantz (1987) were all below a detection limit of 40 μ g/L, so phenol levels may have exceeded water quality standards for aquatic wildlife without being detected.

Suspended sediments in 25 samples ranged from 4 to 1,640 mg/L. The largest calculated instantaneous sediment load was 518 tons/day. The sampled sediments were about 17 % coal, with water discharged from the mines being the probable source (Price and Plantz, 1987).

Price and Plantz (1987) reported good benthic-invertebrate diversity. In the five phytoplankton samples collected in 1981, green algae had a uniform distribution but blue-green algae had relatively larger numbers in three.

Monitoring of Grassy Trail Creek by Sunnyside Mines showed that from 1989 through 1992, when sampling ceased, TDS consistently exceeded 1,200 mg/L between the Sunnyside Mine and the town of Sunnyside. During this same period TDS concentrations also increased at monitoring sites upstream of the main mine area. This does not appear to have been solely due to road salting because concentrations of all ions increased more-or-less uniformly.

BOOK CLIFFS AREA

GRASSY TRAIL CREEK at SUNNYSIDE

USGS Station 09314340

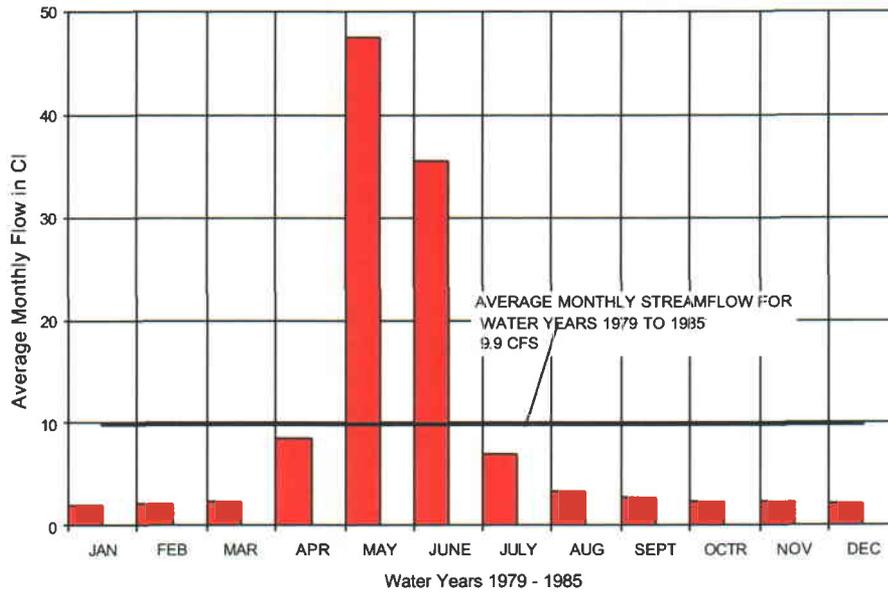


Figure 9 - Average Monthly Flow for Grassy Creek at Sunnyside

TABLE 3. SUMMARY OF SELECT WATER QUALITY DATA FROM USGS STATIONS
PRICE RIVER AT WOODSIDE AND GREEN RIVER AT GREEN RIVER UTAH

STATION NUMBER	STATION NAME	WATER YEAR	DISSOLVED SEDIMENT	SPECIFIC CONDUCTANCE (micro-mohms)		pH (units)	TEMPERATURE (deg. C)	TEMPERATURE (deg. C) at 180	DISSOLVED SOLIDS RESIDUE (mg/L)		CALCIUM (mg/L)	MAGNESIUM (mg/L)	SODIUM (mg/L)	POTASSIUM (mg/L)	CHLORIDE (mg/L)	SULFATE (mg/L)	BI-CARBONATE (mg/L)	IRON (mg/L)		MANGANESE (mg/L)		SUSPENDED			
				Min.	Max.				Fe	TOTAL								Fe	TOTAL	Mn	TOTAL				
09314500	Price River at Woodside	1975-76		Min.	2,200	8.2	0	1,070	170	85	230	7.0	31	1,000	260	-	-	-	-	-	-	-	-		
				Max.	4,950	8.0	26.5	4,830	310	250	730	12.0	78	2,000	330	-	-	-	-	-	-	-	-	-	-
		1976-77		Min.	1,370	7.4	0	1,150	220	16	77	7.0	15	600	170	440	10	600	170	440	10	600	170	17	
				Max.	6,950	8.7	29.0	6,770	400	350	1,100	15.0	130	4,300	570	510,000	70	16,000	110	16,000	70	510,000	70	69,400	
		1977-78		Min.	1,140	7.6	0	1,290	110	79	190	4.0	22	640	40	10	10	640	40	10	10	640	40	27	
				Max.	6,090	8.7	26.0	4,990	330	290	760	13.0	100	3,100	450	18,000	20	860	60	18,000	20	44,420	20	4,420	
		1978-79		Min.	1,110	8.0	-	822	83	51	110	3.4	17	390	240	280	-	390	240	280	-	390	240	16	
				Max.	6,540	8.4	21.5	6,240	250	320	990	17.0	110	3,700	500	46,000	-	3,700	500	46,000	-	3,700	500	5,560	
		1979-80		Min.	1,090	8.0	0	761	-	-	-	-	-	-	-	-	-	-	270	-	0	-	270	93	
				Max.	5,510	8.7	23.0	5,660	-	-	-	-	-	-	-	-	-	-	520	-	63,000	-	520	12,200	
		1980-81		Min.	2,720	8.0	0	2,070	130	130	300	7.2	52	1,300	160	-	-	1,300	160	-	-	1,300	160	0	
				Max.	4,480	8.3	24.0	3,860	250	230	640	12.0	96	2,500	330	-	-	2,500	330	-	-	2,500	330	5,200	
		1981-82		Min.	1,170	8.0	0	830	82	53	97	2.9	16	360	194	9,600	-	360	194	9,600	-	360	194	150	
				Max.	4,080	8.3	23.5	2,880	240	210	530	8.9	90	2,100	350	24,000	-	2,100	350	24,000	-	2,100	350	23,000	
		1982-83		Min.	830	8.2	0	830	82	53	97	2.3	17	210	210	-	-	210	210	-	-	210	210	110	
				Max.	3,920	8.4	20.0	3,500	260	220	520	8.9	79	2,200	340	36,000	-	2,200	340	36,000	-	2,200	340	12,000	
		09315000	Green River at Green River	1975-76		Min.	450	8.1	0	276	41	19	30	1.0	7.7	110	150	570	0	150	570	0	150	570	32
						Max.	1,030	8.7	26.0	704	82	35	110	3.3	35	300	270	32,000	60	1,000	20	32,000	60	1,000	20
1976-77		Min.	530	7.7	0	335	49	15	44	2.1	15	150	160	1,300	0	150	160	1,300	0	150	160	-			
		Max.	1,520	8.7	29.0	1,210	190	43	110	7.0	33	670	300	330,000	190	7,600	20	330,000	190	7,600	20	18,300			
1977-78		Min.	300	7.9	0	212	33	13	33	1.0	7.1	69	190	1,700	10	50	1,700	10	50	1,700	10	95			
		Max.	1,070	8.5	28.5	756	81	39	120	3.5	38	350	270	21,000	40	630	10	21,000	40	630	10	13,400			
1978-79		Min.	300	8.0	0	273	35	15	29	-	8	86	0	830	0	86	0	830	0	86	0	49			
		Max.	1,240	8.5	28.0	852	87	42	110	9.5	41	390	330	19,000	120	500	8	19,000	120	500	8	47,500			
1979-80		Min.	320	7.6	0	214	29	12	21	1.5	7.4	70	130	2,000	<10	70	130	2,000	<10	70	130	60			
		Max.	1,310	8.5	27.0	798	85	37	110	5.0	38	410	260	39,000	40	1,100	10	39,000	40	1,100	10	11,600			
1980-81		Min.	320	7.8	0	273	47	19	50	1.8	14	160	110	1,200	<10	160	110	1,200	<10	160	110	19			
		Max.	1,200	8.3	26.0	852	82	41	110	3.7	40	350	190	27,000	30	880	10	27,000	30	880	10	5,760			
1981-82		Min.	290	8.0	0	196	29	10	19	0.6	6	60	90	10,000	5	210	90	10,000	5	210	90	134			
		Max.	1,060	8.4	27.5	749	82	40	100	3.3	37	320	180	31,000	20	840	6	31,000	20	840	6	16,700			
1982-83		Min.	400	8.0	0	494	30	15	29	-	9.3	98	111	-	6	31	111	-	6	31	111	64			
		Max.	960	8.4	25.0	584	69	32	76	-	2.5	270	104	-	31	130	104	-	31	130	104	5,650			

Notes: Station locations: See Figure 4 (Price River Drainage Basin). Constituents: in mg/L, except manganese and iron, which are in micrograms/L. Specific Conductance: field determinations. pH: field determinations.

CLIMATOLOGIC INFORMATION

The permit area is located in the northwestern portion of the Price River basin in eastern Utah. The basin is surrounded almost completely by mountains, with elevations of over 9,000 ft. in the CIA. The mountains greatly influence local weather, inhibiting cold arctic air masses from penetrating into the region and acting as a barrier to storms approaching from every direction except south.

Daily climatic information is collected at a National Weather Service station in Sunnyside, Utah. Mean monthly precipitation at Sunnyside is shown in Figure 10. Average annual precipitation is 13.56 inches. The area typically receives the greatest quantity of moisture

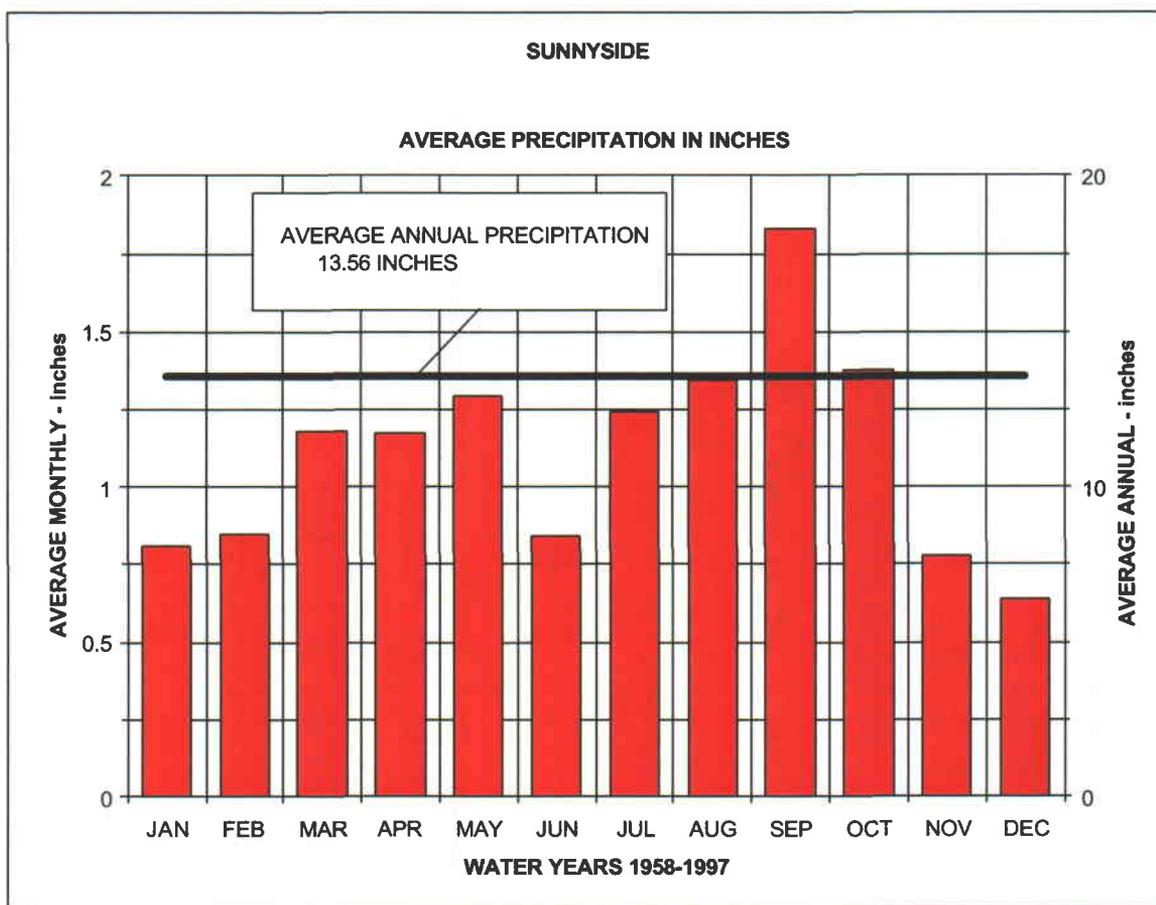


Figure 10 - Precipitation at Sunnyside

from thundershowers in the late summer and early fall (August-October). The driest months at Sunnyside are November to February.

Average annual precipitation in the CIA ranges from approximately 8 inches or less on the valley floor to 16 to 20 inches in upper Lila Canyon (Mundorff, 1972, Plate 2). In the Price

BOOK CLIFFS AREA

River basin as a whole, approximately 65 % of total precipitation falls as snow during the period from October to April and approximately 70 % falls at elevations above 6,000 feet (Mundorff, 1972). At the mouth of Whitmore Canyon (elevation 6,750 feet) near the Sunnyside Mine snow accumulations range from 0 to 21 inches during October through March, but at 7,280 feet snow accumulations ranged from 0 to 50 inches. Monthly maximum, mean monthly maximum, and mean daily snow accumulations for the years 1973 through 1983 at the Sunnyside Mine are in Table 4. Average annual snowfall from 1958 to 1988 at the Sunnyside Mine, approximately elevation 6,800 feet, was 38 inches (Ashcroft and others, 1992). Ground accumulations of snow are characteristically of short duration due to melting and sublimation.

Measured evapotranspiration in the Sunnyside area is 41 to 43 inches (Ashcroft and others, 1992). Sunnyside Coal Company estimated potential evaporation to be over 60 inches (Chapter 4, West Ridge PAP).

Temperature ranges of the permit area are typical for a semi-arid region, with colder temperatures at higher elevations. At the Sunnyside Mine (1958 to 1988) average maximum temperature was 58 degrees, average mean was 46, and the average minimum was 33 degrees. Average monthly temperatures ranged from an average minimum of about 14° F in January to an average maximum of about 85° F in July. Last freeze is typically in late May and first freeze in late September to early October (Ashcroft and others, 1992).

SNOW ACCUMULATION IN INCHES, 1973-1983
SUNNYSIDE MINE
(approximately 6,800 feet elevation)

	<u>Maximum</u>	<u>Mean Maximum</u>	<u>Mean Daily</u>
October	6.5	1.35	0.73
November	6.0	1.69	0.28
December	14.00	4.42	1.73
January	21.00	9.86	4.01
February	21.00	6.44	2.84
March	15.00	5.30	0.60

Table 4

The Palmer Hydrologic Drought Index (PHDI) indicates long-term climatic trends for the region (Figure 11). The PHDI is a monthly value generated by the National Climatic Data

BOOK CLIFFS AREA

Center (NCDC) that indicates the severity of a wet or dry spell. The PHDI is computed from climatic and hydrologic parameters such as temperature, precipitation, evapotranspiration, soil water recharge, soil water loss, and runoff. Because the PHDI takes into account parameters that affect the balance between moisture supply and moisture demand, it is a useful for evaluating the long-term relationship between climate and ground-water recharge and discharge. Figure 11 shows the Palmer Hydrologic Drought Index for Utah Divisions 6 and 7; the permit area lies in Division 7 but near Division 6. These graphs indicate wet years between the late 1970's and late 1980's, followed by several years of drought in the late 1980's and early 1990's. Since about 1993, wet and dry cycles have been shorter.

Wind

Wind data were collected during 1982 and 1983 (1993 Sunnyside Coal Company MRP Appendix 7-2). The data, collected near East Carbon from atop a 45-meter tower, show that the majority of the winds are from the north-northeast through the south-southwest (clockwise) with an average annual speed of 6.2 mph.

Upper level winds, over 1,600 feet above the ground level, are generally from the southwest during most of the year. The wind tends to be strong high in the atmosphere but weakens toward the surface where obstructions and surface friction come into play. During the winter, airflow from the northeast is common. Local night airflow patterns, which are induced by descent of colder air, primarily follow canyon bottoms from the mountains down to the valleys, and wind speed resulting from this descent of colder air is generally light. Daytime flow is strongly influenced by surface heating effects that result in mixing between the surface and upper flows. There is a general airflow toward the north and northeast (to higher elevations) during the day, and toward the southwest (toward lower elevations) during the night. Winds are usually light to moderate (below 20 mph) unless influenced by localized thunderstorms or moving frontal systems. Higher wind speeds are generally associated with storm systems and higher elevations such as ridge tops and plateaus (Chapters 4 and 7 of the West Ridge MRP).

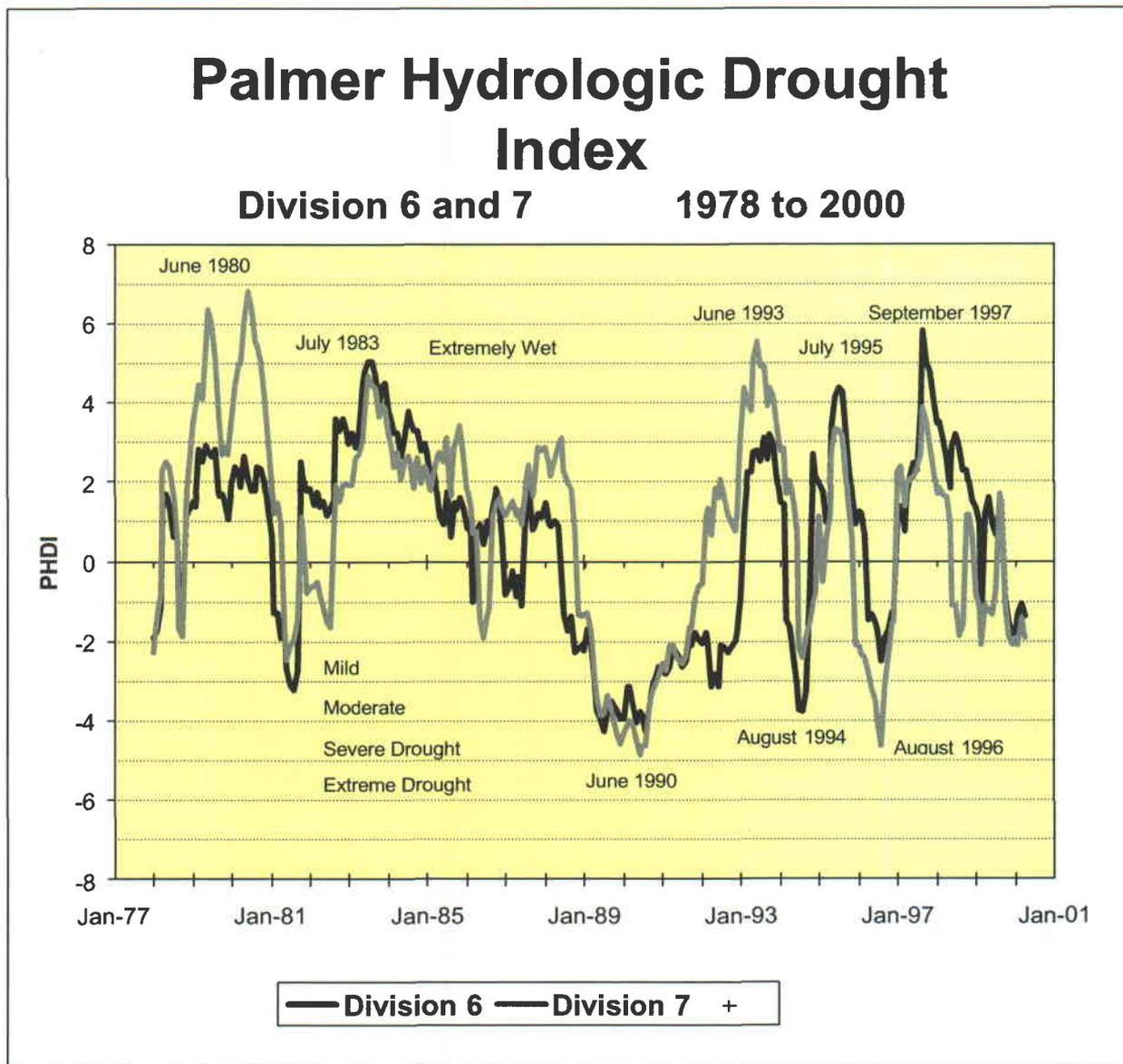


Figure 11 – PHDI for Horse Canyon Region

IV. IDENTIFY HYDROLOGIC CONCERNS

The CHIA is based on the best currently available data and is a prediction of mining related impacts to the hydrologic balance outside of the specific permitted coal mine areas. To verify that conditions remain within acceptable limits the mine operator is required to monitor water quality and quantity as part of the permit requirements. The plans for monitoring are set forth in the Mining and Reclamation Plan (MRP) for the Horse Canyon Mine and have been determined adequate by UDOGM to meet regulatory requirements. If monitoring results show significant departures from the values established in the MRPs and in this CHIA or exceed UPDES discharge requirements, immediate remedial actions are provided for by SMCRA.

Water quality standards for surface waters in the State of Utah are found in R317-2, Utah Administrative Code (UAC). The standards are intended to protect the waters against controllable pollution. Waters, and the applicable standards, are grouped into classes based on beneficial use designations. The Utah Division of Water Quality of the Department of Environmental Quality has classified surface waters in the Horse – Lila Canyon CIA as:

- 2B - protected for recreational uses except swimming,
- 3C - protected for nongame fish and aquatic life, and
- 4 - protected for agricultural uses.

General hydrologic concerns include changes of flow rates and chemical composition that could physically affect the off-permit hydrologic balance. Changes to the existing hydrologic regime or balance need to be limited in order to prevent economic loss to existing agricultural and livestock enterprises, prevent significant alteration to the channel size or gradient, and maintain adequate capacity for existing fish and wildlife communities. The basis for the limiting value of a parameter may differ according to specific site conditions.

Sediment is a common constituent of ephemeral stream flow in the western United States. The quantity of sediment in the flows affects stream-channel stability and most uses of the water. Excessive sediment deposition is detrimental to existing aquatic and wildlife communities. Large concentrations of sediment in streamflow may preclude use of the water for irrigating crops because fine sediment tends to reduce infiltration rates in the irrigated fields, and the sediment reduces capacities of storage facilities and damages pumping equipment. Mean sediment load is the indicator parameter for evaluating the sediment hazard to stream-channel stability and irrigation.

The concentration of dissolved solids is commonly used to indicate general water quality with respect to inorganic constituents. The quality of water from underground sources reflects the chemical composition of the rocks the water passes through. That quality may be degraded by intrusion of poorer quality water from wells or mines, by leakage from adjoining formations, or by recharge through disturbed materials. Ground water discharging from seeps and springs is used by wildlife and livestock. The state standard for TDS for irrigation of crops and stockwatering (Class 4) is 1,200 mg/L.

BOOK CLIFFS AREA

Macroinvertebrates are excellent indicators of stream quality and can be used to evaluate suitability of a stream to support fish and other aquatic life. Because the stream channels on and adjacent to the Lila Canyon ~~Extension Mine~~ function as ephemeral streams, there are no aquatic invertebrates.

The Utah Department of Environmental Quality, Division of Water Quality can authorize a coal mine to discharge into surface waters under the Utah Pollutant Discharge Elimination System (UPDES). The Horse Canyon Mine has a UPDES permit to discharge to Grassy Trail Creek from two points, UPDES point # 1 is located at the principal spillway of the sedimentation pond, and UPDES point #2 is located near the mine portals at a culvert riser that leads directly into the main bypass culvert. UPDES sample point #2 is to sample water that may be discharged directly from the mine.

The Horse Canyon Mine UPDES permit contains limitations on TDS (one-ton/day), total suspended solids (30-day average, 25 mg/L; 7-day average, 35 mg/L; daily maximum, 70 mg/L), total settleable solids (0.5 mL/L for storm-water discharges), total iron (1.0 mg/L), oil and grease (10 mg/L), and pH (between 6.5 and 9.0). There is no limit on flow but it is to be measured monthly, and the duration of intermittent discharge is to be reported along with flow. Additionally, there can be no more than a trace amount of visible sheen, floating solids, or foam and no discharge of sanitary waste or coal process water. Monitoring is by monthly grab samples. (Sunnyside Coal Company had an approved UPDES permit with a TDS concentration limit of 1,650 mg/l for the mine water discharge).

The Lila Canyon addition to the Horse Canyon Mine will require additional UPDES discharge permits. Until they are actually issued, it can only be supposed that they will be similar to those already issued for the Horse Canyon Mine.

Utah water quality standards exist for numerous parameters other than those already mentioned above, but at this time there is no evidence or reason indicating they are of concern or have a reasonable potential to affect the hydrologic balance of the CIA. However, those parameters that may have a reasonable possibility of affecting the hydrologic systems are included in routine water quality monitoring of the mine operations. Review of monitoring results by the mine operators and UDOGM will identify concerns or problems and generate revisions of the mine operations to mitigate those problems.

V. IDENTIFY RELEVANT STANDARDS

RELEVANT STANDARDS

The UPDES permit for the Horse Canyon Mine provides some standards for water quality in the area around Horse and Lila Canyons. The Lila Canyon addition will require permitting of additional UPDES discharge points, and it can only be inferred that the water-quality standards will be the same as for the existing discharge points.

Flow: There is no standard for flow in the Utah water quality standards. The Horse Canyon Mine UPDES permit contains no limit on flow. Discharge is to be measured monthly, and the duration of intermittent discharge is to be reported along with flow. Characteristics such as stream morphology, vertebrate and invertebrate populations, and water chemistry can be affected by changes in flow and therefore can provide an indirect standard for flow.

Oil and Grease: There is no State water quality standard for oil and grease, but the Horse Canyon Mine UPDES permit limit is a daily maximum of 10 mg/L, which is typical of UPDES permits for coal mines in the Wasatch Plateau and Book Cliffs. Only one grab-sample a month is required to measure oil and grease, but any observation of visual sheen requires a sample be taken immediately. A 10 mg/L oil and grease limit does not protect fish and benthic organisms from soluble oils such as those used in longwall hydraulic systems, and UDWR has recommended soluble oils be limited to 1 mg/L (Darrell H. Nish, Acting Director UDWR, letter dated April 17, 1989 to Dianne R. Nielsen, Director UDOGM).

Total Dissolved Solids (TDS) concentrations: The Horse Canyon Mine UPDES permit allows up to one-ton per day, to be determined by one grab sample per month. TDS is commonly used to indicate general water quality with respect to inorganic constituents. There is no state water quality standard for TDS for Classes 1, 2, and 3, but 1,200 mg/l is the limit for agricultural use (Class 4). Sunnyside Coal Company had an approved UPDES permit with a TDS concentration limit of 1,650 mg/l for the mine water discharge.

pH: Allowable pH ranges are 6.5 to 9.0 under State water quality standards for all Classes, and also under the Horse Canyon Mine UPDES permit.

Total Suspended Solids (TSS) and Settleable Solids: the Horse Canyon Mine UPDES permit has the following allowable limits on TSS: 30-day average, 25 mg/L; 7-day average, 35 mg/L; daily maximum, 70 mg/L. TSS is to be determined by a monthly grab sample.

BOOK CLIFFS AREA

There is no State water quality standard for solids in the water, but an increase in turbidity is limited to 10 NTU for Class 2A, 2B, 3A, and 3B waters and to 15 NTU for Class 3C and 3D waters.

Under the current Horse Canyon Mine UPDES permit, all samples collected during storm water discharge events are to be analyzed for settleable solids. Samples collected from increased discharge, overflow, or bypass that is the result of precipitation that does not exceed the 10-year, 24-hour precipitation event may comply with a settleable solids standard of 0.5 mL/L daily maximum rather than the TSS standard, although TSS and the other UPDES parameters are still to be determined. If the increased discharge, overflow, or bypass is the result of precipitation that exceeds the 10-year, 24-hour precipitation event, then neither the TSS nor settleable solids standard applies.

Iron and Manganese: The Horse Canyon Mine UPDES permit allows a daily maximum of 1.0 mg/L total iron, determined by a monthly grab sample. State water quality standards allow a maximum of 1,000 µg/L dissolved iron in Class 3A, 3B, 3C, and 3D waters, with no standard for Class 1, 2, and 4 waters.

Monitoring of total manganese is required by SMCRA and the Utah Coal Mining rules, but there is no UPDES or Utah water quality standard for either total or dissolved manganese.

Macroinvertebrates: Macroinvertebrates are excellent indicators of stream quality and can be used to evaluate suitability of a stream to support fish and other aquatic life. Baseline studies of invertebrates (Lines and Plantz, 1981; USGS, 1980, 1981, 1982 and 1983; Waddell and others, 1982; and Price and Plantz, 1987) provide standards against which actual conditions in Grassy Trail Creek, Horse Canyon, and several nearby creeks can be evaluated if desired.

Utah water quality standards exist for numerous parameters other than those mentioned above, but at this time there is no evidence to indicate nor reason to believe that those parameters are of concern in the Horse – Lila Canyon CIA. However, additional parameters recommended for routine monitoring in UDOGM directive Tech-004 are included in the water-monitoring plan of the Horse Canyon Mine operations.

MATERIAL DAMAGE

Material damage to the hydrologic balance would possibly manifest itself as an economic loss to the current and potential water users, would result in quantifiable reduction of the capability of an area to support fish and wildlife communities, or would cause other quantifiable adverse change to the hydrologic balance outside the permit area. The basis for determining material damage may be found to differ from site-to-site within the CIA according to specific

BOOK CLIFFS AREA

site conditions. Surface-water and ground-water concerns have been identified for CHIA evaluation.

The Division of Oil, Gas and Mining received a letter (B# 002037) from Mr. Josiah Eardley, a landowner, on March 30, 1999, which was during the 30-day Completeness comment period. Mr. Eardley asked-asking the regulatory authority to ensure protection of water rights he owns in Sec. 11, T. 16 S., R. 14 E., near the proposed mine permits area. Mr. Eardley's water rights, as well as all water rights on the proposed permit area were evaluated during the review process to ensure the utmost protection.

Mining has been conducted directly underneath or adjacent to springs H-18, H-18A, H-18B, H-19, H-21, H-21A, H-21B, H-22 and H-92 in the upper portion of Lila Canyon Wash. No more mining will be conducted to affect these springs (Plates 5-1, Bates No. 5138, and Plate 7-1, Bates No. 5659). The area already undermined includes water rights 91-617 and 91-618, totaling 0.22 cfs, in Sec 11. These water rights are shown in Table 7-2 (B# 005355) as belonging to Mont Blackburn, but presumably these are the rights Mr. Eardley claims. Plate 5-3 (B# 005141) shows that the Lila Canyon Mine will not mine near any listed water rights in Section 11. All of the spring sources mentioned above flow down Lila Canyon Wash, no springs flow down Little Park Wash.

Parameters for surface-water quantity and quality

The potential material-damage concerns this CHIA focuses on are changes of surface flow rates and chemical composition that would physically affect the off-permit stream channel systems as they presently function and affect aquatic and wildlife communities. There is no farming in the CIA, however there is livestock production. Therefore, criteria are intended to identify changes in the present discharge regime that might be indicators of economic loss to the livestock enterprise, of significant alteration to the channel size or gradient, or of loss of capacity to support existing fish and wildlife communities within the CIA. In order to assess the potential for material-damage to these elements of the hydrologic system, the following indicator parameters were selected for evaluation at each evaluation site: low-flow discharge rate, TDS, and sediment load.

The surface-waters will be evaluated at L-1-G, L-2-G, L-3-G, RF-1, HC-1 and B-1 in the drainages below the escarpments. Generally, these sites have been dry and receive flow only during rapid snowmelt and heavy rainstorms.

Low-Flow Discharge Rate

Measurements provided by mine operators are generally of instantaneous flow and provide some indication of long-term trends, but are probably no more accurate either individually or as a whole than the "poor" USGS measurements. In the Wasatch Plateau, Waddell and others (1981) found that correlating three years of low-flow records (September) at stream sites against corresponding records from long-term monitoring sites would allow the

BOOK CLIFFS AREA

development of a relationship that could be used to estimate future low-flow volumes at the stream sites within a standard deviation of approximately 20 %. Ten years of measurements reduced the standard deviation to 16 - 17 % and 15 years of data reduced it to about 15 %. This relationship has not been demonstrated for streams in the Book Cliffs; however, it indicates that a change in low-flow rates of less than 15 to 20 % probably would not be detectable. A 20 % decrease in the low-flow rate will provide a threshold indicator that decreased flows are persisting and that an evaluation for material damage is needed. However, because flows in Horse and Lila Canyons are intermittent, material damage due to loss of flow is very unlikely, and the intermittent nature of the flow will also make any such loss almost impossible to detect.

Monitoring of mine-discharge rates will provide a means to evaluate effects of the mine discharge on the receiving streams. The potential for material damage by mine discharge water is tied to the effect of that discharge on the flow in the receiving streams, and that effect will be most pronounced during low-flow, which at Lila and Horse Canyons is no-flow. Water from the Lila Canyon ~~Extension Mine~~ disturbed area will be monitored at the discharge from the sedimentation pond (L-4-S). Direct discharge from the mine will be monitored near the mine portal (L-5-G). The operator of the Horse Canyon Mine has applied for UPDES permits to discharge from these two locations.

Total Dissolved Solids (TDS)

The concentration of dissolved solids is commonly used to indicate general water quality with respect to inorganic constituents. Wildlife and livestock use is the designated post-mining land use for the Horse Canyon and Lila Canyon Mines, so established dissolved solids tolerance levels for wildlife and livestock have been adopted as the thresholds beyond which material damage may occur. The state standard for TDS for irrigation of crops and stockwatering (Class 4) is 1,200 mg/L. If TDS concentrations persistently exceed 1,200 mg/L it will be an indication that evaluation for potential material damage is needed.

Sediment Load

Sediment is a common constituent of ephemeral stream flow in the western United States. The quantity of sediment in the flows affects stream-channel stability and most uses of the water. Excessive sediment deposition is detrimental to existing aquatic and wildlife communities. Large concentrations of sediment in streamflow may preclude use of the water for irrigating crops because fine sediment tends to reduce infiltration rates in the irrigated fields, and the sediment reduces capacities of storage facilities and damages pumping equipment. Sediment load measurement error is, at a minimum, the same as the flow measurement error because sediment load is directly dependent on flow and in practice cannot be measured more accurately than the flow.

TSS is the indicator parameter initially chosen for evaluating the sediment hazard to stream-channel stability and irrigation. Threshold values have initially been set as the greater of 1 standard error above the baseline mean TSS value or 120 % of the baseline mean TSS value

BOOK CLIFFS AREA

(by analogy with the low-flow discharge rate measurement accuracy and assuming that the error in TSS will contribute equally to the error in flow when determining mean sediment load). If TSS concentrations persistently exceed these threshold values it will be an indication that evaluation for material damage from sediment load in the streams might be needed.

Parameters for ground-water quantity and quality

The potential material-damage concerns this of CHIA are intended to limit changes in the quantity and chemical composition of water from ground-water sources to magnitudes that: will not cause economic loss to existing or potential agricultural and livestock enterprises; will not degrade domestic supplies; would not cause structural damage to the aquifers; and will maintain adequate capacity for existing fish and wildlife communities.

To assess the potential for material damage to these elements of the ground-water hydrologic system, the following indicator parameters were selected for evaluation: seasonal flow from springs and TDS concentration in spring and mine-discharge water.

Ground-water concerns will be monitored at five springs, three ~~piezometers~~wells, and the mine-water UPDES discharge point at the Lila Canyon area, and will continue at springs and wells in the Horse Canyon area. Locations are identified on Plate 1. If UDOGM finds that inflow to the mine is significant or persistent, UDOGM can require monitoring of mine inflow.

Seasonal flow from springs

Maintain potentiometric heads that sustain average spring discharge rates, on a seasonal basis, equal or greater than 80 % of the mean seasonal baseline discharge, or in other words baseline minus 20 % probable measurement error. The 20 % measurement error is based on analogy with the accuracy of measuring low-flow surface discharge rates. A 20 % decrease in flows, determined on a seasonal basis, will indicate that decreased flows are probably persisting and that an evaluation for material damage is needed.

TDS concentration

The concentration of total dissolved solids is commonly used to indicate general water quality with respect to inorganic constituents. The quality of water from underground sources reflects the chemical composition of the rocks the water passes through. Ground-water quality may be degraded by intrusion of poorer quality water from wells or mines, by leakage from adjoining formations, or by recharge through disturbed materials. Ground water discharging from seeps and springs is used by wildlife and livestock, and those are the designated postmining land uses. There is no water quality standard for TDS for aquatic wildlife. The state standard for TDS for irrigation of crops and stockwatering (Class 4) is 1,200 mg/L. If TDS concentrations persistently exceed 1,200 mg/L it will be an indication that evaluation for material damage is needed.

VI. ESTIMATE PROBABLE FUTURE IMPACTS OF MINING ACTIVITY

GROUND WATER

Acid and toxic contamination, dewatering, and subsidence related to mining have ~~minimal~~ ~~the-greatest~~ potential for impacting ground-water resources in the CIA.

No acid or toxic discharges should occur. The potential for acid mine drainage was evaluated for the mine. There is a good potential that mine water will be discharge based on piezometer levels. The applicant has committed that all discharges of water from this operation will be made in compliance with all Utah and federal water quality laws and regulations and with effluent limitations for coal mining promulgated by the U. S. Environmental Protection Agency set forth in 40 CFR Part 434. Groundwater intercepted in the mine will be stored in sumps and treated prior to any discharges, Bates No.5381. The applicant has applied for a UPDES permit for mine water discharge in the event discharges are necessary. Water quality collected from the Horse Canyon Mine by Waddell , 1982 and by the operator indicate good water quality with above normal buffering capabilities for any acidic solutions produced. In the event that all fail-safe measures are overcome and any acidic waters are discharged, they would be discharged into a channel lined with buffering constituents of the Mancos Shale. The receiving stream is partially classified as intermittent, but acts ephemeral by nature. The nearest perennial stream, the Price River, is 58,000 feet (11 miles) down stream. Mine discharges would likely not reach the Price River. Based on the aridity of the area and thickness of alluvial sediments in the valley, no impacts to the Price River are anticipated.

Potentially acid- or toxic-forming materials will be identified by use of Material Safety Data Sheets (MSDS), or by direct sampling and analysis in the case of underground development waste. Such waste will be tested for acid- or toxic-forming potential, and if found to be acid- or toxic-forming, the waste site will be protected from surface runoff by the use of earthen berms. Any material which exhibits acid- or toxic-forming characteristics will be properly stored, protected from runoff, removed to an approved disposal site or buried on site beneath a minimum of 4' of non-acid, non-toxic material. Underground development waste (if any) will also be stored in a designated area. Upon reclamation the surface will be shaped to drain overland flow and prevent long term exposure to groundwater thus, preventing chemical reactions which cause acidic drainage.

A Spill Prevention Control and Countermeasure (SPCC) Plan will be implemented. Storage of potentially acid- or toxic-forming materials, such as fuel, oils, solvents and non-coal waste will be in a controlled manner, designed to contain spillage and prevent runoff to surface or ground water resources. All oils and solvents will be stored in proper containers within

BOOK CLIFFS AREA

enclosed structures. Fuels will be stored in appropriate tanks, enclosed within concrete or earthen bermed areas designed to contain any spillage.

Non-coal waste (garbage) will be stored in a designated location, in dumpsters, and removed to an approved landfill (East Carbon Development Contractors - ECDC) on a regular, as-needed basis.

Unused or obsolete equipment or supplies will be stored in a designated area. Drainage from the storage area will be directed to the sediment pond as shown on the Sediment Control Map, Plate 7-5.

Dewatering

Underground mining removes the support to overlying rock, causing caving and fracturing of overlying strata. In areas where fracturing is extensive, subsidence induced caving and fracturing can create conduits that allow ground water to flow into the mine. Dewatering caused by fracturing may decrease aquifer storage. Ground water in storage is not a major recharge source to springs. Only Redden spring receives recharge from the deep ground-water storage in the CIA. Fracturing of overlying strata will only intercept some of the deep ground-water storage. These areas will eventually drain and dry up because most of the beds have low hydrologic conductivities. In the CIA, it is unlikely that fractures will reach shallower perched aquifers that supply springs because of the thickness of the overlying strata is well over 1,500 feet. Water discharged downstream from the Book Cliffs is often of better quality than natural spring flow or base flow.

Total ground-water storage can be estimated above the Lower Sunnyside coal seam by assuming an average saturated thickness of 1,000 feet, an area of 5,544 acres, and a storage coefficient of 0.10, the same as used for Soldier Canyon Mine. At the Horse Canyon Mine, the maximum cover exceeds 1,500 feet and the average overburden is approximately 1,500 feet, so 1,000 feet may be a reasonable estimate of saturated thickness. Therefore an estimate of total ground-water storage above possible Horse Canyon Mine workings is 554,400 ac-ft.

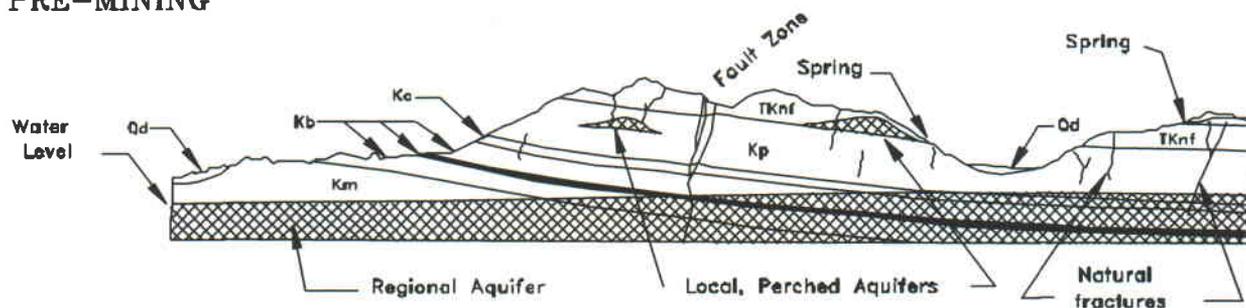
Annual average ground-water recharge for the 7.2 miles² of the Lila Canyon **Extension Mine** is estimated to be 622 ac-ft using 9 % as the average infiltration factor and 18 inches as the average precipitation for the recharge area. Because of hydrologic isolation between the Blackhawk Formation and the surface, UEI does not foresee an increase in recharge rates or a decrease in discharge rates at the surface because of dewatering of deeper strata. Another reason that a notable or measurable increase in recharge is also unlikely is because recharge is generally available only for a few months during spring snowmelt and for very brief periods during summer thundershowers. During these seasonal, relatively short events the soils reach saturation quickly and reject most available water.

The Blackhawk Formation is probably saturated in most areas (Waddell and others, 1986, p. 41) and the Lila Canyon **Extension Mine** might be expected to produce water at rates

BOOK CLIFFS AREA

similar to those observed in the Soldier and Horse Canyon Mines. Most water entering mines comes from ground water stored in the overlying strata after fracturing of the rock above the mine. Due to the great amount of strata between the Lila Canyon Extension Mine and springs on the surface, the springs or their recharge sources will not be affected. The mobility and expanding characteristics of clays, shales and mudstones in the overlying strata should also help seal conduits created by fracturing (Figure 12).

PRE-MINING



POST-MINING

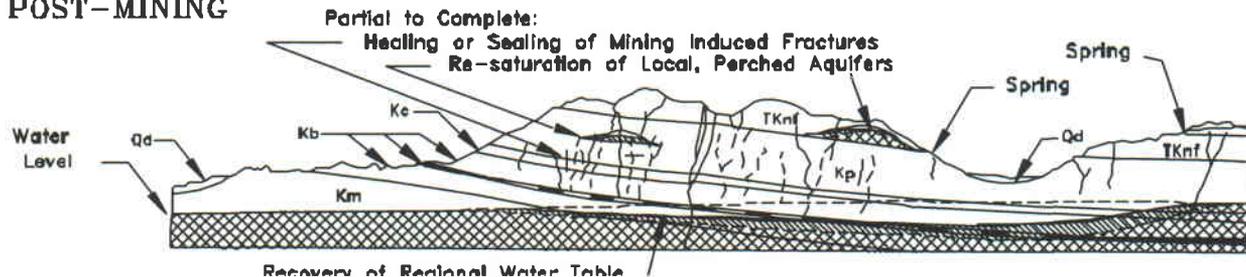


Figure 12. A cross-section of the Book Cliffs showing the relationship between mining, geologic strata and ground water before and after mining.

Subsidence

Subsidence impacts are largely related to extension and expansion of existing fracture systems 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 decreased flow through existing fractures that close, increased flow rates along existing fractures that open further, and the diverting of ground-water flow along new fractures or within newly accessible permeable lithologies. Subsurface flow diversion may cause the depletion of water in local aquifers and loss of flow to springs that are undermined.

BOOK CLIFFS AREA

Annual reports for 1988, 1989, 1992, 1993, 1994, 1995, and 1996 for the Soldier Canyon Mine indicate no surface subsidence over the current permit area (indicated elevation changes are within the limit of accuracy of the survey method). Mining has occurred beneath 500 to 2,000 feet of overlying strata and mining is projected to be done beneath up to 2,250 feet of cover. The Castlegate Sandstone and thick overburden are responsible for reduced surface subsidence at Soldier Canyon.

It is anticipated that the thickness of the same formations in the Lila Canyon area will also prevent subsidence. Mining is also taking place in only one coal seam, the Lower Sunnyside seam, which ranges from 4 to 16 feet thick. Strata above the mine ranges from 500 feet to 2,500 feet.

SURFACE WATER

Changes in flow volume and in water quality have the greatest potential for impacting water resources in the CIA. Sites that have been or are currently being used to monitor surface- and ground-water are shown on Plate 1.

Water Quality

Uncontrolled runoff from the disturbed lands and waste piles could increase sediment concentrations and alter the distribution and concentration of dissolved solids in the receiving streams. Sedimentation controls are already in place for receiving streams in the Horse Canyon Mine area. The potential for inducing water quality changes in the Lila Canyon channel and south fork of Coleman Wash and other streams has been fully recognized by the regulatory authorities, and a runoff control plan has been established for the Lila **Canyon Extension Mines** that is adequate in anticipating, mitigating and monitoring the potential impacts.

Four stations at Lila Canyon will monitor ephemeral drainages contributing to lower Grassy Trail Creek: L-1-S in upper Lila Canyon; L-2-S above the disturbed area in the south fork of Coleman wash, Lila Canyon; and L-3-S below the mine site in Lila Canyon. L-4-S will monitor discharge from the sedimentation pond, if any should occur. Three surface-water monitoring stations are in place to monitor Horse Canyon Creek.

If it becomes necessary to discharge water from the proposed mine **extension**, the water will discharge into the Lila Canyon wash. In addition to being monitored at LCM-1 and LCM-3, discharged water will be subject to monthly monitoring stipulated by a UPDES permit. Because the monitoring required under the UPDES permit is more stringent and more frequent than that proposed in this permit application, discharge samples will be collected from the UPDES discharge monitoring point rather than at the drainage monitoring stations.

BOOK CLIFFS AREA

The UPDES permits for Lila Canyon will probably be similar to those for Horse Canyon. The current Horse Canyon permit has limits on: TDS (one-ton/day), total suspended solids (30-day average, 25 mg/L; 7-day average, 35 mg/L; daily maximum, 70 mg/L), total settleable solids (0.5 mL/L for storm-water discharges), total iron (1.0 mg/L), oil and grease (10 mg/L), and pH (between 6.5 and 9.0). There is no limit on flow, but it is to be measured and reported monthly. The duration of intermittent discharge is to be reported along with flow. Additionally, there can be no more than a trace amount of visible sheen, floating solids, or foam and no discharge of sanitary waste or coal process water. Monitoring is to be by monthly grab samples.

CIA Sediment Control

Sedimentation controls are already in place at the Horse Canyon Mine. A portion of the disturbed area has been reclaimed. Phase I bond release was approved in 1997 and Phase II bond release has been conditionally approved for that area. One condition is the removal of sedimentation pond #2.

The Horse Canyon Mine sedimentation pond #1 is still functioning and collects the runoff from the Bond exempt area. The pond is sized to contain the runoff for a 10-year, 24-hour precipitation event plus sediment volume of three years.

Sediment will be controlled from the Lila Canyon ~~mine~~ Extension. Undisturbed runoff will be routed around the disturbed area. The MRP describes construction methods to be used to control runoff and sediment. A sedimentation pond is to be used throughout mining and Phase II reclamation periods. Runoff control will need to be implemented using alternative methods (i.e. silt fences, berms, straw bales) during installation of the 60-inch undisturbed culvert and upon its removal and restoration of the natural channel through the site.

The expected sediment from the Lila mine disturbed area is 0.3090ac-ft/yr. The sedimentation pond at Lila Canyon is designed for the complete retention of the 10-year, 24-hour storm event plus three years of sediment storage. This will effectively reduce the sediment yield from the disturbed area to an insignificant amount during the operational and reclamation phase of the mine. Drainage from undisturbed areas will, for the most part, be carried under the mine site through a bypass culvert.

The principal spillway will be a 24-inch corrugated metal pipe fitted with an oil skimmer. This spillway will discharge flows over the 10-yr-24-hr precipitation event. The emergency spillway will convey any flow in excess of the 25-year, 6-hour precipitation event out of the pond. Both spillways will flow directly into the bypass culvert to the South Fork of Coleman Wash. A riprap headwall and apron will prevent erosion of the channel around the undisturbed culvert.

When the bypass culvert is removed for reclamation, the channel will be regraded and silt fences will be installed adjacent to the reclaimed channel, approximately along contour and with

BOOK CLIFFS AREA

overlapping ends, to collect and contain sediment from the site. The surface of the regraded area will be gouged with a backhoe bucket to create large depressions that act as sediment traps. All the disturbed areas will be reseeded using seedmixes approved by UDOGM. The sediment yield from the reclaimed area is anticipated to be minimal. Water monitoring will determine if runoff levels are lower than the undisturbed channels.

Alternate sediment control areas (ASCA) will be used in areas where the surface disturbance is minor and sediment control is expected to be restored fairly rapidly with revegetation. At the topsoil stockpiles, ditches will divert undisturbed area runoff away from the stockpiles, silt fencing will be placed around the stockpiles to minimize siltation from the stockpile, the surface of the stockpiles will be pocked and roughened to retain moisture and minimize runoff, and the surface of the piles will be revegetated to minimize surface erosion. The office and parking lot area below the mine yard facility area will slope to one end, where silt fencing will be used for sediment control, and the slopes and embankment of the office pad will be revegetated to control sedimentation and erosion.

Water Quantity

If it becomes necessary to discharge water from the Lila workings of the Horse Canyon Mine, the water will discharge into the Lila Canyon drainage. In addition to being monitored at L-5-G, discharged water will be subject to monthly monitoring stipulated by a UPDES permit.

Upon termination of mining operations, if there has been any discharge of ground water from the Lila or Horse Canyon Mines, discharge will be discontinued and the mine will begin to flood. There will be a reduction in surface flow because of the loss of the mine discharge. Because the drainages are intermittent, there is little or no baseflow to these streams, and surface flow will probably be unaffected by a return to pre-mining conditions as the mine floods. The time required for mine flooding will depend not only on the rate of water inflow but also on the amount of caving and the void space remaining after caving. Complete flooding of the mine may never occur because flow out of the mine through the roof, floor, and ribs and into the surrounding rock will increase as flooding increases the hydraulic head within the abandoned workings.

It is anticipated that discharge of water from the Lila Canyon ~~mine~~ Extension ~~mine~~ operations will be similar what has been observed or predicted at the Dugout and West Ridge Mines and the old Horse Canyon workings. Upon termination of mining operations, the Lila workings will probably flood to the same extent as the Horse Canyon workings. There will be no gravity discharge from the mine

It is anticipated that no acid or toxic mineral contamination will take place during or anytime after mining. Surrounding soils and bedrock contain buffering compounds of calcium carbonates and bicarbonates. Mine water discharge should not take place, because the formations slope back away from the mine portals. All rockwaste and coalwaste having a potential of acid or toxic forming materials will be buried at least four feet deep. All disturbed

BOOK CLIFFS AREA

area runoff will be contained, monitored, and treated if required before discharge to ensure water quality standards are met.

ALLUVIAL VALLEY FLOORS

The Lila Canyon and Horse Canyon Mine pads would be the only surface disturbances within the permit area during the life of the mine. Factors are present within the permit area that would preclude these sites, as well as the permit and adjacent areas, from classification as alluvial valley floors.

VII. ASSESS PROBABLE MATERIAL DAMAGE.

The probable hydrologic impacts are summarized below under the headings entitled First Five Year Permit Term and Future Mining.

FIRST FIVE YEAR PERMIT TERM (Horse Canyon - Lila Canyon ~~Extension Mine~~)

The Horse Canyon - Lila Canyon ~~Extension Mine~~ is expected to be dry initially, with water inflow increasing as mining progresses. The rate of dewatering will probably be less than the estimated recharge rate during the first five year permit term. Overburden thickness will be substantial (500 to 2,400 feet) to restrict surface manifestations of subsidence. Subsurface propagation of fractures may produce changes in ground-water flow that could require the mine operator to discharge minewater after it is treated and tested. There will be no impacts to intermittent streams or springs over the area designated for mining. Future monitoring will provide data applicable to documenting changes in the ground-water system.

Surface disturbance and the discharge to Lila Canyon are not expected to degrade water quality. Sediment control measures that are proposed for use at the Lila Canyon ~~Extension Mine~~ have been checked for functionality and should prevent diminution to water quality.

There is no AVF to be impacted.

FUTURE MINING

Increased rates of dewatering may in the future result in depletion of ground-water storage in some beds above the coal seam. Upon cessation of mining, mine water discharge, if there has been any, will be discontinued. Mine flooding will probably result in reestablishment of the preexisting ground-water systems.

Drainage from future surface disturbance will be managed through appropriate sediment controls. Future Horse Canyon - Lila Canyon ~~Extension Mine~~ discharges will be directed through sediment control measures. Hydrologic structures will prevent erosion.

At the termination of mining, downstream potential AVFs will experience decreased flow as mine discharge stops. The duration and extent of this impact cannot be accurately assessed at this time. However, flow rates may be partially to fully restored when the ground-water system is reestablished by flooding of the abandoned mines.

The operational designs for the Horse Canyon - Lila Canyon ~~Extension Mines~~ are evaluated based on the information submitted in the mine plans and referenced literature and in accordance with the regulations of the Utah Coal Rules. UEI's planned prevention, control, and

BOOK CLIFFS AREA

containment plans will prevent damage to the hydrologic balance outside the mine plan areas and protect wildlife and agricultural uses.

BOOK CLIFFS AREA

VII. STATEMENT OF FINDINGS.

The Utah Division of Oil, Gas and Mining finds that there will be no impacts to hydrologic resources that will degrade water quality below set standards or interrupt flow to spring and streams in the CIA. **No probability of material damage from actual or anticipated mining operations has been found.**

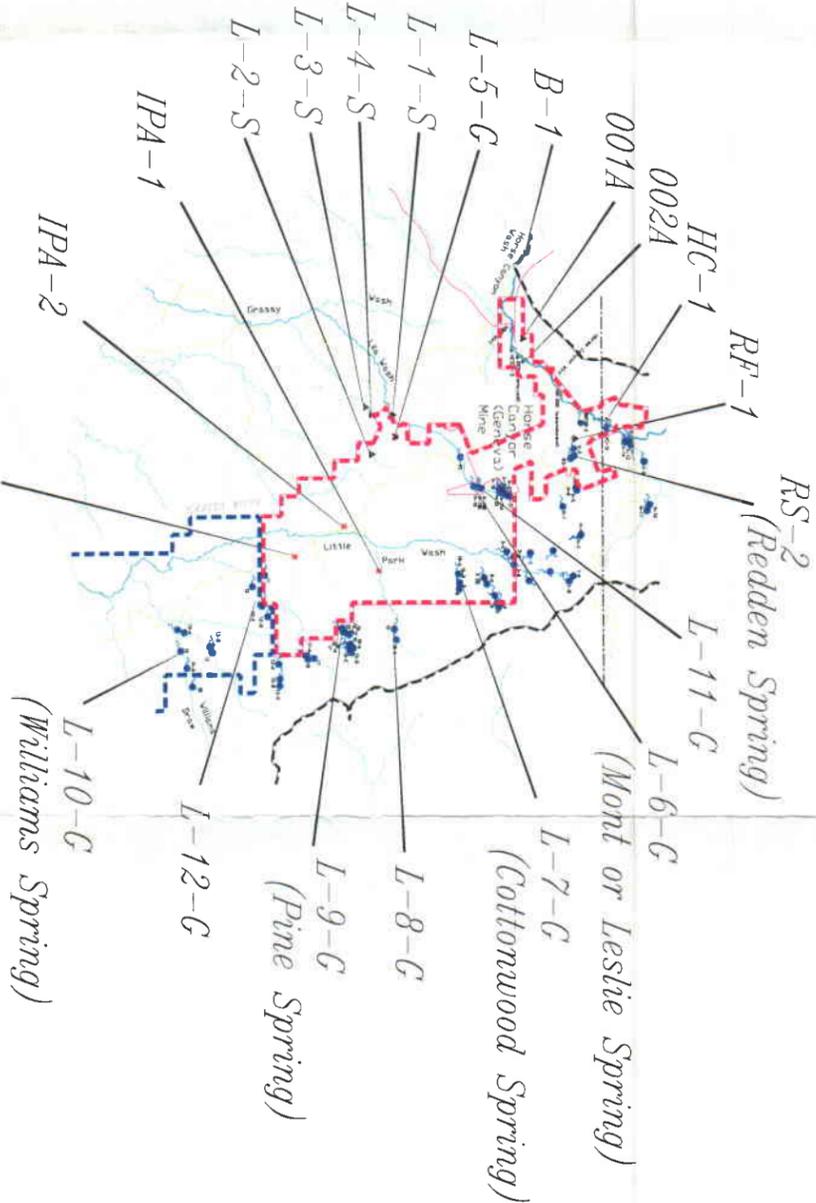
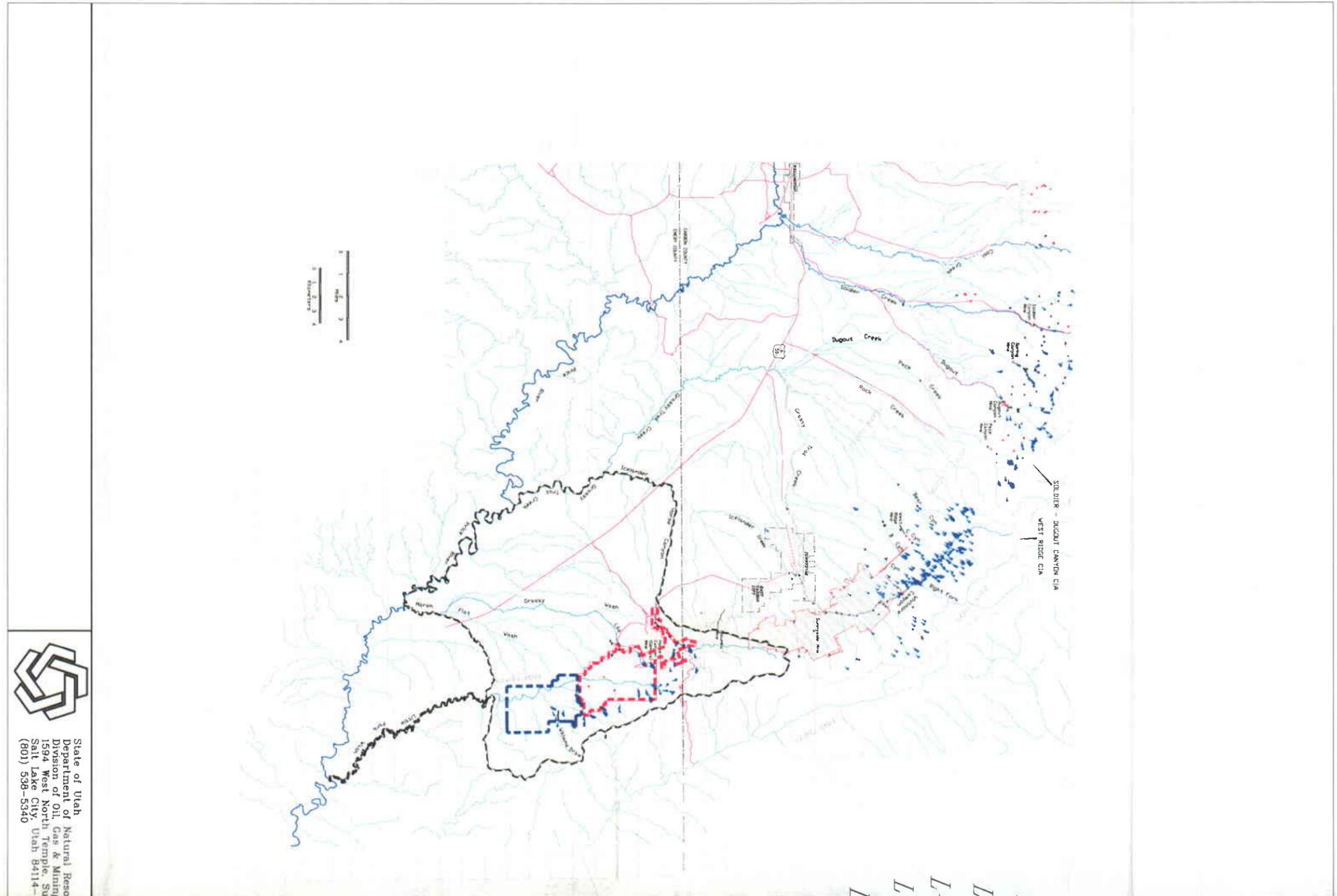
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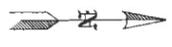
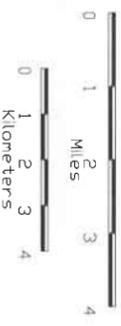
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EXPLANATION

	SPRING		HORSE CANYON MINE - LIMA CANYON CMA BOUNDARY
	SURFACE WATER MONITORING POINT		OTHER CMA BOUNDARIES
	WELL - INCLUDING SPRING BROWNEAR POINTS		HORSE CANYON CANYON MINE - SOUTH LEASE (LMA) - SOUTH R. DICK
	WELL		UNPAVED ROADS AND TRAILS
	ROCK HOLE		INTERMITTENT OR SEASONAL STREAM
	COAL MINE		PERMANENT STREAM
	COAL RESERVE?		PAVED ROADS

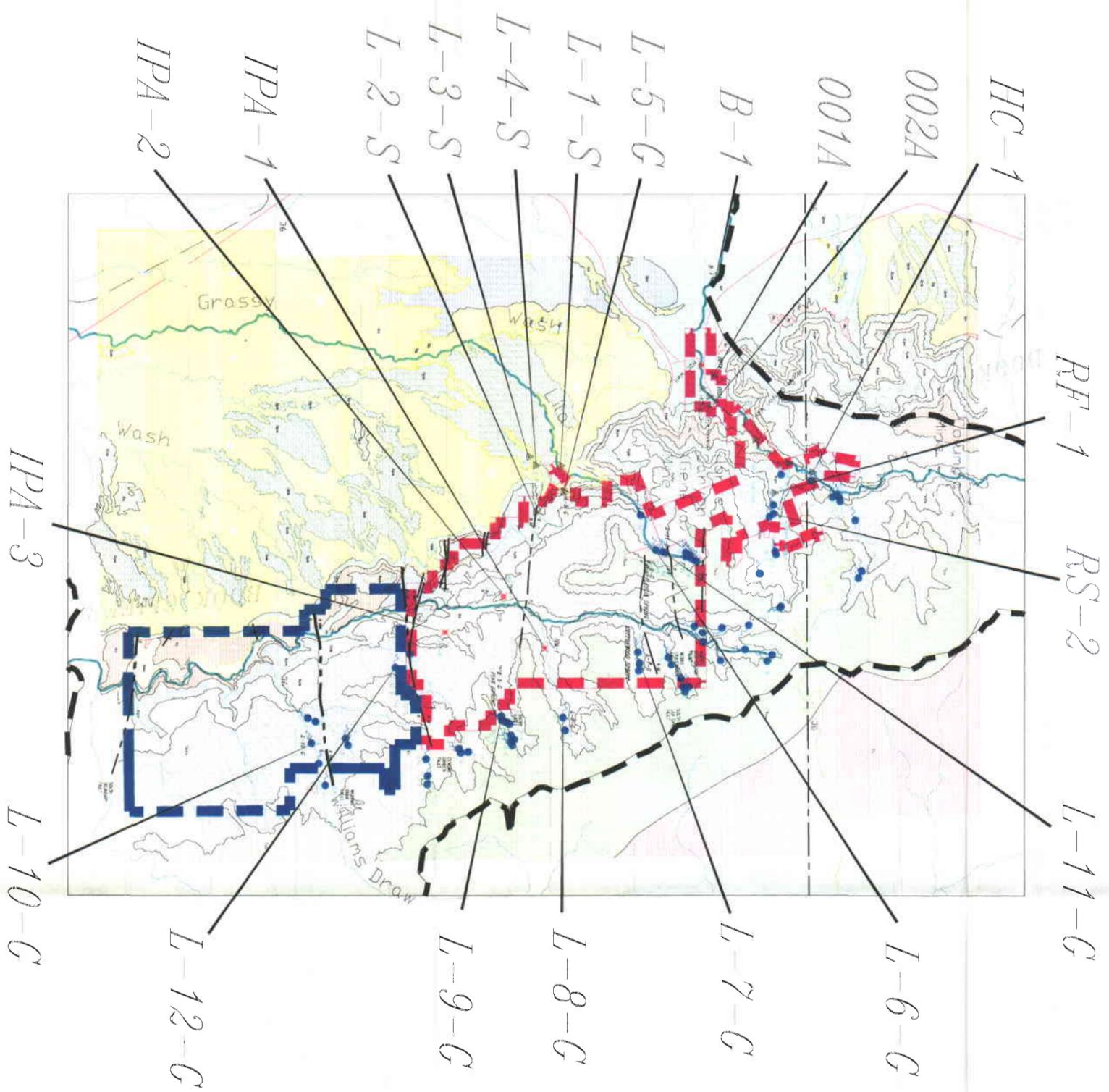


State of Utah
 Department of Natural Resources
 Division of Oil, Gas & Mining
 1594 West North Temple, Suite 1210
 Salt Lake City, Utah 84114-2501
 (801) 536-5340

Drawn By: J. B. SMITH
 Date: 12-15-2001
 Title: JAN 18, 2002

Plate 1 - CUMULATIVE IMPACT AREA (CIA)
 HORSE CANYON MINE, LILA CANYON ADDITION

DWG. NO. 01-SP-ANDERS CANYON/AUTODRAWN/MS-SP-14-01



EXPLANATION

DESCRIPTION OF MAP UNITS

GA	2000' ELEVATION	GA	2000' ELEVATION
3g	3000' ELEVATION	3g	3000' ELEVATION
3c	3000' ELEVATION	3c	3000' ELEVATION
3f	3000' ELEVATION	3f	3000' ELEVATION
3h	3000' ELEVATION	3h	3000' ELEVATION
3i	3000' ELEVATION	3i	3000' ELEVATION
3j	3000' ELEVATION	3j	3000' ELEVATION
3k	3000' ELEVATION	3k	3000' ELEVATION
3l	3000' ELEVATION	3l	3000' ELEVATION
3m	3000' ELEVATION	3m	3000' ELEVATION
3n	3000' ELEVATION	3n	3000' ELEVATION
3o	3000' ELEVATION	3o	3000' ELEVATION
3p	3000' ELEVATION	3p	3000' ELEVATION
3q	3000' ELEVATION	3q	3000' ELEVATION
3r	3000' ELEVATION	3r	3000' ELEVATION
3s	3000' ELEVATION	3s	3000' ELEVATION
3t	3000' ELEVATION	3t	3000' ELEVATION
3u	3000' ELEVATION	3u	3000' ELEVATION
3v	3000' ELEVATION	3v	3000' ELEVATION
3w	3000' ELEVATION	3w	3000' ELEVATION
3x	3000' ELEVATION	3x	3000' ELEVATION
3y	3000' ELEVATION	3y	3000' ELEVATION
3z	3000' ELEVATION	3z	3000' ELEVATION

- SPRING
- SURFACE WATER MONITORING POINT - INCLUDING UPDES DISCHARGE POINTS
- WELL
- COAL MINE
- COAL PROSPECT
- HORSE CANYON - LILA CANYON DIA BOUNDARY
- HORSE CANYON PERMIT AREA INCLUDING LILA CANYON ADDITION
- SOUTH LEASE LMA - SOUTH BLOCK
- PAVED ROADS
- UNPAVED ROADS AND RAILS
- INTERMITTENT or EFFLUENT STREAM
- PERENNIAL STREAM

1:25000



PLATE 2 - GEOLOGY OF THE CIA HORSE CANYON MINE, LILA CANYON ADDITION

Drawn By	J. D. SMITH	Scale	SEE MAP SCALE
Date	MARCH 9, 2001	Dwg. No.	DNDG\HORSE CANYON\JTD\ADD\PLATES\PLATE2.DWG
Revised	J. D. SMITH		
Date	JULY 20, 2001		



State of Utah
 Department of Natural Resources
 Division of Oil, Gas & Mining
 1594 West North Temple, Suite 1210
 Salt Lake City, Utah 84114-5801
 (801) 538-5340

AFFIDAVIT OF PUBLICATION

STATE OF UTAH)

ss.

County of Carbon.)

I, Kevin Ashby, on oath, say that I am the Publisher of the Sun Advocate, a twice-weekly newspaper of general circulation, published at Price, 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 4th day of March, 1999 and that the last publication of such notice was in the issue of such newspaper dated the 25th day of March, 1999.

Kevin Ashby
Kevin Ashby - Publisher

Subscribed and sworn to before me this 25th day of March 1999.

Linda Thayne
Notary Public My commission expires January 10, 2003 Residing at Price, Utah

Publication fee, \$ 441.60



**PUBLIC NOTICE
SIGNIFICANT REVISION
UtahAmerican Energy, Inc.
HORSE CANYON MINE**

Notice is hereby given that UtahAmerican Energy Inc., P.O. Box 986, Price, Utah 84501, has submitted a complete application to the State of Utah, Division of Oil, Gas & Mining for a significant revision to the Horse Canyon Mine Permit Number ACT/007/013. The new application will be known as part "B" Lila Canyon Mine and is a significant revision to the existing Horse Canyon Mine Permit.

A copy of the complete application is available for inspection at the Division of Oil, Gas & Mining office located at 1594 West North Temple, Suite 1210, Salt Lake City, Utah 84114-5801 and at the Emery County Recorder's Office, Emery County Courthouse, Castle Dale, Utah 84513 and at the Carbon County Recorder's Office, Carbon County Courthouse, Price, Utah 84501.

The addition to the permit are is described as follows:

T16S R14E

Section 10	Portions of SE1/4	Section 22	NE1/4NE1/4
Section 11	E1/2 Portions of W1/2	Section 23	N1/2 SE1/4 E1/2SW1/4
Section 12	All	Section 24	All
Section 13	All	Section 25	N1/2
Section 14	All	Section 26	N1/2NE1/4 SE1/4NE1/4

Section 15 Portions of E1/2 SW1/4

T16S R15E

Section 19 W1/2SW1/4 SE1/4SW1/4 S1/4NE1/4SW1/4

Section 30 NW1/4 SW1/4 NE1/4 S1/4NW1/4NE1/4

The described areas are contained on the following U.S. Geological Survey 7.5 minute quadrangle maps, Cedar, Lila Point.

Written comments, objection or requests for informal conferences on the application may be submitted by anyone affected by this proposal. Such comments should be filed within the next thirty (30) days with: State of Utah, Department of Natural Resources, Division of Oil, Gas & Mining.

Published in the Sun Advocate March 4, 11, 18 and 25, 1999.

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 9th day of March, 1999 and that the last publication of such notice was in the issue of such newspaper dated the 30th day of March, 1999.

Kevin Ashby

Kevin Ashby - Publisher

Subscribed and sworn to before me this 30th day of March, 1999.

Linda Thayne

Notary Public My commission expires January 10, 2003 Residing at Price, Utah

Publication fee, \$ 316.80

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SIGNIFICANT REVISION
UtahAmerican Energy, Inc.
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Section 11	E1/2 Portions of W1/2	Section 23	N1/2 SE1/4 E1/2SW1/4
Section 12	All	Section 24	All
Section 13	All	Section 25	N1/2
Section 14	All	Section 26	N1/2NE1/4 SE1/4NE1/4
Section 15	Portions of E1/2 SW1/4		

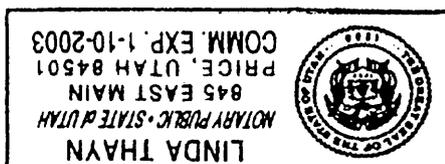
T16S R15E

Section 19	W1/2SW1/4 SE1/4SW1/4 S1/4NE1/4SW1/4
Section 30	NW1/4 SW1/4 NE1/4 S1/4NW1/4NE1/4

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Written comments, objection or requests for informal conferences on the application may be submitted by anyone affected by this proposal. Such comments should be filed within the next thirty (30) days with: State of Utah, Department of Natural Resources, Division of Oil, Gas & Mining.

Published in the Emery County Progress March 9, 16, 23 and 30, 1999.





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

Michael O. Leavitt
Governor
Kathleen Clarke
Executive Director
Lowell P. Braxton
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January 9, 2002

TO: Compliance File

FROM: Pamela Grubaugh-Littig, Permit Supervisor 

RE: 510 (c) Recommendation for UtahAmerican Energy Inc., Horse Canyon Mine, C/007/013

As of this writing of this memo, there are no NOV's or CO's which are not corrected or in the process of being corrected for the Horse Canyon Mine. There are no finalized civil penalties, which are outstanding and overdue in the name of Utah American Energy, Inc. UtahAmerican Energy, Inc. does not have a demonstrated pattern of willful violations, nor have they been subject to any bond forfeitures for any operation in the state of Utah.

Attached is an OSM recommendation from the Applicant Violator System (AVS) with a notice that there was one violation retrieved by the system. This link is to a state violation issued to Belmont Coal Company in Ohio and is coded "C" in the AVS. (This violation refers to a Civil Penalty Assessment Number 12163 for Cessation Order #8614, written as a failure to abate for violation #21197. Cessation Order #8614 was terminated on February 12, 2001. This is now identified as OH D1020 in the AVS).

I contacted Scott Stiteler, Environmental Specialist at the Ohio Division of Mineral Resources Management (614-265-6431) on January 8, 2002. He verified that the civil penalty in question is under administrative remedy and is in the process of being resolved, i.e. a conference has been scheduled. Therefore, this is not a permit block. But the permit is issued "conditionally" until the matter is resolved. The condition is that "UtahAmerican Energy, Inc. must notify the Division of the resolution of the Belmont Coal Company (OH D1020) within 15 days of its resolution."

State : UT Permit No : ACT007013 Appl No : ACT007013
Permittee : 146487(UTAHAMERICAN ENERGY INC) Seqno : 2
Applicant : 146487(UTAHAMERICAN ENERGY INC)

OSMRE: Comments/Analysis: Date : 09-Jan-2002 Mode : UPDATE
The state violation of Belmont Coal (OH D1020) is coded 'C',
indicating a settlement, payment plan, or pending challenge. Linking
entities are Clyde Borrell and Robert Murray. aw

SRA: Comments/Analysis: Date : Mode : VIEW

SAVE (F5) DELETE (F8)
PRV_SCR (F3) QUIT (F4) CHOICES (F10)



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

Michael O. Leavitt
Governor
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July 26, 2001

TO: Compliance File

FROM: Pamela Grubaugh-Littig, Permit Supervisor *pgl*

RE: 510 (c) Recommendation for UtahAmerican Energy Inc., Horse Canyon Mine, C/007/013,

As of this writing of this memo, there are no NOV's or CO's which are not corrected or in the process of being corrected for the Horse Canyon Mine. There are no finalized civil penalties, which are outstanding and overdue in the name of Utah American Energy, Inc. UtahAmerican Energy, Inc. does not have a demonstrated pattern of willful violations, nor have they been subject to any bond forfeitures for any operation in the state of Utah.

Attached is an OSM recommendation from the Applicant Violator System with a notice that there were no violations retrieved by the system.

sm

O:\007013.HOR\Compliance\AVS_072601.doc

Application Evaluation Report Applicant Violator System 26-Jul-2001 08:10:11

State : UT Permit No : ACT007013 Appl No : ACT007013
Permittee : 146487(UTAHAMERICAN ENERGY INC) Seqno : 2
Applicant : 146487(UTAHAMERICAN ENERGY INC)

OSMRE: Comments/Analysis: Date : 26-Jul-2001 Mode : VIEW

There were no violations retrieved by the system. be

SRA: Comments/Analysis: Date : 26-Jul-2001 Mode : UPDATE

SAVE(F5) DELETE(F8)
PRV_SCR(F3) QUIT(F4) CHOICES(F10)

MD KER DDE WINSOCK Node Connected CLR ↑

JT228 88 ONLINE 18 35 Hold

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