



Lila Canyon Project
P. O. Box 910
East Carbon, Utah 84520
Phone: (435) 888-4000
(435) 650-3157
Fax: (435) 888-4002

Utah Division of Oil, Gas & Mining
Utah Coal Program
1594 West North Temple, Suite 1210
P.O. Box 145801
Salt Lake City, UT 84114-5801

October 14, 2016

Attn: Daron Haddock
Permit Supervisor

Re: Lila Canyon Mine, UtahAmerican Energy, Inc. C/007/013
IBC Ventilation Breakout, Task #5256

Dear Mr. Haddock,

In response to the Division's review of the application for an IBC for the new Ventilation Breakouts, please find in this submittal the complete resubmittal of the application, in its entirety, including the corrections to the deficiencies for Task #5256, C1 and C2 forms, redline strikeouts, and maps. Please note, that one deficiency listed in Task #5256 stated that the information required to meet regulation R645-301-333 was inadequate. After discussion with Joe Helfrich, it was determined that the information needed to satisfy this deficiency is located on page 5 of Appendix 5-9, and that this deficiency is satisfied.

If you have any questions, or need any additional information regarding this submittal, please contact me directly at 435-888-4000.

Sincerely,

A handwritten signature in black ink, appearing to read 'Karin Madsen', written over a horizontal line.

Karin Madsen
Engineering Tech
UtahAmerican Energy, Inc.

APPLICATION FOR PERMIT PROCESSING

<input checked="" type="checkbox"/> Permit Change X	<input type="checkbox"/> New Permit	<input type="checkbox"/> Renewal	<input type="checkbox"/> Transfer	<input type="checkbox"/> Exploration	<input type="checkbox"/> Bond Release	Permit Number: ACT/007/013
L16-001 Lila Canyon Incidental Boundary Change for New Ventilation Breakout						Mine: Lila Canyon
Task ID 5256						Permittee: UtahAmerican Energy, Inc.

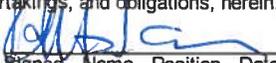
Description, include reason for application and timing required to implement:

Instructions: If you answer yes to any of the first 8 questions (gray), submit the application to the Salt Lake Office. Otherwise, you may submit it to your reclamation

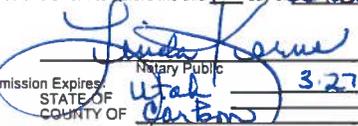
<input type="checkbox"/> Yes	<input type="checkbox"/> No	1. Change in the size of the Permit Area? Add 40 acres Disturbed Area? _____ acres X increase <input type="checkbox"/> decrease.
<input type="checkbox"/> Yes	<input type="checkbox"/> No	2. Is the application submitted as a result of a Division Order? DO # _____
<input type="checkbox"/> Yes	<input type="checkbox"/> No	3. Does application include operations outside a previously identified Cumulative Hydrologic Impact Area?
<input type="checkbox"/> Yes	<input type="checkbox"/> No	4. Does application include operations in hydrologic basins other than as currently approved?
<input type="checkbox"/> Yes	<input type="checkbox"/> No	5. Does application result from cancellation, reduction or increase of insurance or reclamation bond?
<input type="checkbox"/> Yes	<input type="checkbox"/> No	6. Does the application require or include public notice/publication?
<input type="checkbox"/> Yes	<input type="checkbox"/> No	7. Does the application require or include ownership, control, right-of-entry, or compliance information?
<input type="checkbox"/> Yes	<input type="checkbox"/> No	8. Is proposed activity within 100 feet of a public road or cemetery or 300 feet of an occupied dwelling?
<input type="checkbox"/> Yes	<input type="checkbox"/> No	9. Is the application submitted as a result of a Violation? NOV # _____
<input type="checkbox"/> Yes	<input type="checkbox"/> No	10. Is the application submitted as a result of other laws or regulations or policies? Explain: _____
<input type="checkbox"/> Yes	<input type="checkbox"/> No	11. Does the application affect the surface landowner or change the post mining land use?
<input type="checkbox"/> Yes	<input type="checkbox"/> No	12. Does the application require or include underground design or mine sequence and timing? (Modification of R2P2?)
<input type="checkbox"/> Yes	<input type="checkbox"/> No	13. Does the application require or include collection and reporting of any baseline information?
<input type="checkbox"/> Yes	<input type="checkbox"/> No	14. Could the application have any effect on wildlife or vegetation outside the current disturbed area? Insignificant
<input type="checkbox"/> Yes	<input type="checkbox"/> No	15. Does application require or include soil removal, storage or placement? Insignificant
<input type="checkbox"/> Yes	<input type="checkbox"/> No	16. Does the application require or include vegetation monitoring, removal or revegetation activities?
<input type="checkbox"/> Yes	<input type="checkbox"/> No	17. Does the application require or include construction, modification, or removal of surface facilities?
<input type="checkbox"/> Yes	<input type="checkbox"/> No	18. Does the application require or include water monitoring, sediment or drainage control measures?
<input type="checkbox"/> Yes	<input type="checkbox"/> No	19. Does the application require or include certified designs, maps, or calculations?
<input type="checkbox"/> Yes	<input type="checkbox"/> No	20. Does the application require or include subsidence control or monitoring?
<input type="checkbox"/> Yes	<input type="checkbox"/> No	21. Have reclamation costs for bonding been provided for?
<input type="checkbox"/> Yes	<input type="checkbox"/> No	22. Does application involve a perennial stream, a stream buffer zone or discharges to a stream?
<input type="checkbox"/> Yes	<input type="checkbox"/> No	23. Does the application affect permits issued by other agencies or permits issued to other entities?

X Attach complete copies of the application.

I hereby certify that I am a responsible official of the applicant and that the information contained in this application is true and correct to the best of my information and belief in all respects with the laws of Utah in reference to commitments, undertakings, and obligations, herein.


 Signed - Name - Position - Date
 Karin Madsen / Engineering Tech / 10-13-16

Subscribed and sworn to before me this 13th day of October, 2016


 Notary Public
 My Commission Expires 3.27.17
 Attest: STATE OF Utah
 COUNTY OF Carbon



LINDA KERNS
 NOTARY PUBLIC - STATE OF UTAH
 COMMISSION # 663616
 COMM. EXP. 03/27/2017

Received by Oil, Gas & Mining

ASSIGNED TRACKING NUMBER

Application for Permit Processing Detailed Schedule of Changes to the MRP

L16-001 Lila Canyon Incidental Boundary Change for New Ventilation Breakout
Task ID #5256

Permit Number: ACT/007/013

Mine: Lila Canyon

Permittee: UtahAmerican Energy, Inc.

Provide a detailed listing of all changes to the mining and reclamation plan which will be required as a result of this proposed permit application. Individually list all maps and drawings which are to be added, replaced, or removed from the plan. Include changes of the table of contents, section of the plan, pages, or other information as needed to specifically locate, identify and revise the existing mining and reclamation plan. **Include page, section and drawing numbers as part of the description.**

DESCRIPTION OF MAP, TEXT, OR MATERIALS TO BE CHANGED

<input type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	DESCRIPTION OF MAP, TEXT, OR MATERIALS TO BE CHANGED
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Plates 1 through 41 have been revised, and replaced with the following: Plate 1-1 Permit Area Map Revised Plate 2-1 Soils Map Revised Plate 3-1A Wildlife Habitat: Raptors (Confidential) Revised Plate 3-1B Wildlife Habitat: Big Horn Sheep / Antelope Revised Plate 3-1C Wildlife Habitat: Elk Revised Plate 3-1D Wildlife Habitat: Mule Deer Revised Plate 3-2 Vegetation Map Revised Plate 4-1 Surface Ownership Revised Plate 4-2 Grazing Allotments Revised Plate 4-3 Cultural Resources (Confidential) Revised Plate 4-4 Area of Wilderness Character Revised Plate 5-1 Previously Mined Areas Revised Plate 5-2a IBC Area - Graben Breakout New Plate 5-3 (Confidential) Subsidence Control Map (Confidential) Revised Plate 5-3 Subsidence Control Map Revised Plate 5-4 Coal Ownership Revised Plate 5-5 Mine Map Revised Plate 6-1 Project Area Geologic Map Revised Plate 6-2 General Geology Revised Plate 6-3 Coal Thickness Isopachs Revised Plate 6-4 Cover and Structure Map Revised Plate 6-5 Coal Sections Revised Plate 7-1 Permit Area Hydrology Revised Plate 7-1A Permit Area Hydrology with Geologic Map Revised Plate 7-3 Water Rights Revised Plate 7-4 Water Monitoring Locations Revised
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Chapter 1 pages Table of Contents, 10, 11, 12, 13, 15, 16, 17, 18
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Chapter 2 page 15
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Chapter 3 pages 5, 6, 8, 19, 20
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Chapter 5 Lists of Appendixes, pages, 21, 22, 54, 61, 62,
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Chapter 7 pages 4, 48
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Appendix 5-9
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Bonding Calculations

Any other specific or special instructions required for insertion of this proposal into the Mining and Reclamation Plan?

WordPerfect Document Compare Summary

Original document: K:\Lila\2016\L16-001 Ventilation Breakout and Removal of Part A and B References\Originals\Chapter 1 old.wpd

Revised document: K:\Lila\2016\L16-001 Ventilation Breakout and Removal of Part A and B References\Deficiencies Task 5197\Chapter 1 Edits Task 5197.wpd

Deletions are shown with the following attributes and color:

~~Strikeout~~, Blue RGB(0,0,255).

Deleted text is shown as full text.

Insertions are shown with the following attributes and color:

Double Underline, Redline, Red RGB(255,0,0).

The document was marked with 35 Deletions, 70 Insertions, 0 Moves.

Lila Canyon Extension

Chapter 1 Legal

Volume 1 of 7

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100. GENERAL CONTENTS.**110. Minimum Requirements****111. Intent**

The information included within this chapter of the permit application is intended to satisfy the minimum requirements of R645-301-100. All relevant information on the ownership and control of persons who conduct coal mining and reclamation operations, the ownership and control of the property to be affected by the operation, the compliance status and history of those persons, and other important information is provided. The format for the permit application was used to facilitate expedient review and approval.

112. Identification of Interests.

112.100. The applicant, **UtahAmerican Energy, Inc.**, is a corporation organized and existing under the laws of Utah and qualified to do business in Utah.

112.200. The name, address, telephone number, and employer identification number of the applicant, resident agent, and person who will pay the abandoned mine land reclamation fee is as follows:

112.210. The Applicant **UtahAmerican Energy, Inc.**, will also be the operator.

UtahAmerican Energy, Inc.
P.O. Box 986
Price, Utah 84501

Employer Identification Number: 34-1874726

112.220. The resident agent of the applicant, UtahAmerican Energy, Inc., is:

Karin Odendahl
UtahAmerican Energy, Inc.
P.O. Box 986
Price, Utah 84501

112.230. The abandoned mine land reclamation fee will be paid by:

Robert E. Murray
UtahAmerican Energy, Inc.
46226 National Road
St. Clairsville, Ohio 43950

112.300. The person's name, address and employer identification number for each person who owns or controls the applicant is listed under Appendix 1-1. In addition Appendix 1-1 shows the persons ownership or control relationship to the applicant, percentage of ownership, and location in the organizational structure.

112.310. Persons who own or control names, address social security numbers and employer identification numbers can be found in Appendix 1-1.

112.320. Persons ownership or control relationship to the applicant can be found in Appendix 1-1.

112.330. Title of the person's position and date position was assumed can be found in Appendix 1-1.

112.340. **UtahAmerican Energy, Inc.,**
The American Coal Company
PennAmerican L.P.
Canterbury Coal Company
Energy Resources, Inc.
Oklahoma Coal Company
Ohio Valley Coal Company
MonValley Transportation Center, Inc.
KenAmerican Resources, Inc.
Belmont Coal, Inc.
UMCO Energy, Inc.
Maple Creek Mining, Inc.

Onieda Coal, Inc.
Spring Church Coal Company

Permit numbers, regulatory authority and issuance dates are found in Appendix 1-2.

- 112.350.** There are no pending coal mine permit applications in any State in the United States.
- 112.400.** Miscellaneous information for coal mining and reclamation operations owned or controlled by the applicant or by any person who owns or controls the applicant follows.
- 112.410.** The name, address, identifying numbers, including employer identification number, Federal or State permit numbers and MSHA number, with date of issuance and the regulatory authority issuing the permit can be found in Appendix 1-2.
- 112.420.** Ownership or control relationship to the applicant is presented in Appendix 1-1.
- 112.500.** The name and address of each legal owner of the surface and mineral property to be mined is shown on Plate 4-1 for surface ownership and Plate 5-4 for coal ownership, and is as follows:

Surface Owners:

Josiah K Eardley:

2433 S HWY 10
Route 1, Box 119
Price, Utah 84501

Bronco Coal Company:

P.O. Box 217
Cleveland, Utah 84518

UTAHAMERICAN ENERGY, INC.:

46226 National Road
St. Clairsville, Ohio 43950

UNITED STATES DEPARTMENT OF THE INTERIOR:

Bureau of Land Management
Utah State Office
324 South State
Salt Lake City, Utah 84111

STATE OF UTAH:

Utah School and Institutional Trust Lands Administration
(SITLA)
675 East 500 South Suite 500
Salt Lake City, Utah 84114-5703

COLLEGE OF EASTERN UTAH FOUNDATION:

451 East 400 North
Price, Utah 84501

Subsurface Owners:**UTAHAMERICAN ENERGY, INC.:**

46226 National Road
St. Clairsville, Ohio 43950

Bronco Coal Company:

P.O. Box 217
Cleveland, Utah 84518

STATE OF UTAH:

Utah School and Institutional Trust Lands Administration
(SITLA)
675 East 500 South Suite 500
Salt Lake City, Utah 84114-5703

UNITED STATES DEPARTMENT OF THE INTERIOR:

Bureau of Land Management
Utah State Office
324 South State
Salt Lake City, Utah 84111

COLLEGE OF EASTERN UTAH FOUNDATION:

451 East 400 North
Price, Utah 84501

112.600. The name and address of each owner (surface and

subsurface) of all property contiguous to the proposed permit area is shown on Plate 4-1 for surface, and Plate 5-4 for subsurface. Plate 1-1 is the official boundary map and it will be used to clarify any questions about the permit boundaries. Plate 1-2 shows the disturbed area.

Contiguous Surface Owners:

UNITED STATES DEPARTMENT OF THE INTERIOR:

Bureau of Land Management
Utah State Office
324 South State
Salt Lake City, Utah 84111

STATE OF UTAH:

Utah School and Institutional Trust Lands Administration
(SITLA)
675 East 500 South Suite 500
Salt Lake City, Utah 84114-5703

Josiah K Eardley:

2433 S HWY 10
Route 1, Box 119
Price, Utah 84501

Bronco Coal Company:

P.O. Box 217
Cleveland, Utah 84518

UTAHAMERICAN ENERGY, INC.:

46226 National Road
St. Clairsville, Ohio 43950

WILLIAM MARSING LIVESTOCK INC.:

4330 E 8900 N
Price, Utah 84501

COLLEGE OF EASTERN UTAH FOUNDATION:

451 East 400 North
Price, Utah 84501

Contiguous Subsurface Owners:**UNITED STATES DEPARTMENT OF THE INTERIOR:**

Bureau of Land Management
Utah State Office
324 South State
Salt Lake city, Utah 84111

STATE OF UTAH:

Utah School and Institutional Trust Lands Administration
(SITLA)
675 East 500 South Suite 500
Salt Lake City, Utah 84114-5703

UTAHAMERICAN ENERGY, INC.:

46226 National Road
St. Clairsville, Ohio 43950

Bronco Coal Company:

P.O. Box 217
Cleveland, Utah 84518

COLLEGE OF EASTERN UTAH FOUNDATION:

451 East 400 North
Price, Utah 84501

- 112.700.** The following is a list of MSHA numbers associated with the permit.

MSHA ID Number: 42-00100 (Horse Canyon)
MSHA ID Number 42-02241 (Lila Canyon)
Refuse Pile I.D. Number: 1211-UT-09-02241-01

United States Department of Labor
Mine, Safety and Health Administration
P.O. Box 25367
Denver, Colorado 80225

- 112.800.** In February 2002, UEI submitted a lease by application to the BLM. Four thousand acres were identified as an area of

interest to the south and east of current UEI reserves. The LBA delineation and recoverable reserves has yet to be determined by the BLM. If the area of interest is offered for lease, and if UEI bids on the LBA, and if UEI is the successful bidder, then it could be anticipated that mining in the leased area would occur once current Lila reserves are exhausted. (Approximately in the year 2020)

112.900. After **UtahAmerican Energy, Inc.**, is notified that the application is approved, but before the permit is issued, **UtahAmerican Energy, Inc.**, will update, correct or indicate that no change has occurred in the information previously submitted under R645-301-112.100 to R645-301-112.800.

113. Violation Information.

113.100. Neither **UtahAmerican Energy, Inc.**, or any subsidiary, affiliate, or persons controlled by or under common control with the applicant, has had any federal or state permit to conduct coal mining and reclamation operations suspended or revoked in the five years preceding the date of submission of the application.

113.110. No federal or state permits to conduct coal mining and reclamation operations has been suspended or revoked in the five years preceding the date of submission of the application.

113.120. Neither **UtahAmerican Energy, Inc.**, nor any subsidiary, affiliate, or persons controlled by or under common control with the applicant, have forfeited a performance bond or similar security deposited in lieu of bond.

113.200. Since no suspensions revocations, or forfeitures have taken

place section 113.200 with subsections is not applicable.

- 113.300.** A list of violations received by the applicant or any subsidiary, affiliate or persons controlled by or under common control with the applicant in connection with any coal mining and reclamation operation during the three year period proceeding the application date is provided in Appendix 1-3. MSHA numbers for the operations listed in Appendix 1-3 can be found in Appendix 1-2.
- 113.310.** Violation information such as: Identifying numbers including Federal and State permit numbers, date issued, and name of issuing agency is included in Appendix 1-3.
- 113.320.** A brief description of violations alleged in the notice is included in Appendix 1-3.
- 113.330.** The date, location, and type of any administrative or judicial proceeding is included in Appendix 1-3.
- 113.340.** The current status of violations is included in Appendix 1-3.
- 113.350.** Actions taken to abate the violation is included in Appendix 1-3.
- 113.400.** After **UtahAmerican Energy, Inc.**, is notified that the application is approved, but before the permit is issued, **UtahAmerican Energy, Inc.**, will update, correct or indicate that no change has occurred in the information previously submitted under R645-301-113.

114. Right-of-Entry Information.

A Right-of-Way application and the subsequent Environmental Assessment

(EA) has been submitted to the BLM. The EA was issued for public comment in the summer of 2000. A Finding of No Significant Impact (FONSI) and record of decision were issued in October 2000. An appeal was filed and a stay requested. The stay was not acted on and an uninhibited Right-of-Way could be issued in the spring of 2003. Appendix 1-6 contains BLM correspondence in regards to Right-of-Entry as provided by the pending Right-of-Way and its related use.

114.100. **UtahAmerican Energy, Inc.**, currently holds 5,5447,365.0116 acres of federal coal contained in six federal leases, purchase in June 2000 from Intermountain Power Agency and assigned to UEI by the BLM. (See Table 1-1 and Plate 5-4). These leases are contained in the South Lease - North Block LMU filed May 1996. The leases as described in the North Block LMU are not under any pending litigation. **UtahAmerican Energy, Inc.**, bases its legal right to enter and conduct mining activities in the permit area pursuant to the language contained in the Federal Coal Lease, Part I Lease Rights Granted which reads as follows:

“That the lessor, in consideration of the rents and royalties to be paid and the covenants to be observed as hereinafter set forth, does hereby grant and lease to the lessee the exclusive right and privilege to mine and dispose of all the coal in, upon, or under the following described tracts of land, situated in the State of Utah.... together with the right to construct all such works, buildings, plants, structures and appliances as may be necessary and convenient for the mining and preparation of the coal for market, the manufacture of coke or other products of coal, the housing and welfare of employees, and subject to the conditions herein provided, to use so much of the surface as may reasonably be required in the exercise of the rights and privileges herein granted.”

The surface right-of-entry is in the form of BLM right-of-ways. See Appendix 1-1 for a BLM letter assigning right-of-way numbers.

114.200. Since no private mineral estate is involved this section does not apply.

114.210. Since no private mineral estate is involved this section

does not apply.

114.220. Since no private mineral estate is involved this section does not apply.

114.230. Since no private mineral estate is involved this section does not apply.

**Table 1-1
Federal Coal Leases Held by Permittee (See Plate 5-4)**

Federal Coal Lease	Township & Range	Section	Description	Acres
#SL-066490 <u>(Tract 1)</u>	<u>T16S, R14E</u>	11	E1/2	244 <u>05.00</u>
	T16S, R14E	12	W1/2	
	T16S, R14E	13	W1/2	
	T16S, R14E	14	E1/2, SW1/4	
	T16S, R14E	15	E1/2SE1/4	
	T16S, R14E	22	NE1/4NE1/4	
	T16S, R14E	23	N1/2, E1/2SW1/4, SE1/4	
	T16S, R14E	24	NW1/4, W1/2SW1/4	
	T16S, R14E	26	N1/2NE1/4	
<u>(Tract 2)</u>	<u>T16S, R14E</u>	<u>15</u>	<u>SE1/4SE1/4, NW1/4SE1/4, NE1/4NE1/4SW1/4SE1/4</u>	
#U-014218	T16S, R14E	12	E1/2	320. <u>00</u>
#U-0126947	T16S, R14E	13	E1/2	4059.84 <u>1992</u> <u>.15</u>
	<u>T16S, R14E</u>	<u>24</u>	<u>E1/2</u>	
	<u>T16S, R14E</u>	<u>25</u>	<u>N1/2NE1/4, SE1/4NE1/4</u>	
	T16S, R15E	19	SE1/4SW1/4, Lots 3 & 4	
	T16S, R15E	<u>29</u>	<u>SW1/4SW1/4</u>	
<u>#U-0126947 (continued)</u>	<u>T16S, R15E</u>	30	<u>Lots 1 & 2, E1/2NW1/4, E1/2SW1/4, SE1/4SE1/4, SW1/4NE1/4, W1/2SE1/4</u>	
	<u>T16S, R15E</u>	<u>31</u>	<u>Lot 4, E1/2, NE1/4NW1/4, SE1/4SW1/4</u>	
	<u>T17S, R15E</u>	<u>5</u>	<u>Lots 3 & 4</u>	
	<u>T17S, R15E</u>	<u>6</u>	<u>Lots 1, 2, 3 & 4</u>	

#U-014217	T16S, R14E	25	SW1/4NE1/4	40 <u>455.84</u>
	<u>T16S, R15E</u>	<u>30</u>	<u>Lots 3 & 4</u>	
	<u>T16S, R15E</u>	<u>31</u>	<u>Lots 1-3, SE1/4NW1/4, NE1/4SW1/4</u>	
#SL-069291	T16S, R14E	24	E1/2SW1/4	200 <u>600.00</u>
	T16S, R14E	25	NW1/4 <u>W1/2</u>	
	T16S, R14E	26	SE1/4NE1/4, <u>E1/2SE1/4</u>	
	#SL-066145 T16S, R14E	<u>35</u>	<u>Lots 1-3, 7-11, NE1/4SW1/4, SE1/4</u> <u>N1/2NE1/4</u>	4404.20
<u>#SL-066145</u>	T16S, R14E	40 <u>E1/2</u> <u>3</u>	<u>Lots 1-3 & 7-11, NE1/4SW1/4, SE1/4</u>	<u>1552.17</u>
	T16S, R14E	44	W1/2 <u>Lot 4</u>	
	T16S, R14E	140	NW1/4 <u>E1/2, E1/2NW1/4, NE1/4SW1/4</u>	
	T16S, R14E	<u>11</u>	<u>W1/2</u>	
	<u>T16S, R14E</u>	<u>14</u>	<u>NW1/4</u>	
	<u>T16S, R14E</u>	15	N1/2NE1/4, SE1/4NE1/4	
Totals	Six Leases			5544 <u>7365.64</u> <u>16</u>

115. Status of Unsuitability Claims.

115.100. The proposed permit area is not within an area designated as unsuitable for mining. **UtahAmerican Energy, Inc.**, is not aware of any petitions currently in progress to designate the area as unsuitable for coal mining and reclamation activities.

115.200. Since no exemption is requested this section does not apply.

115.300. UtahAmerican Energy, Inc., will not conduct mining operations within 300 feet of a currently occupied dwelling. However, UtahAmerican Energy, Inc., will conduct mining or mining related activities within 100 feet of a public road.

UtahAmerican Energy, Inc., has received permission from Emery County to construct facilities and operate coal mining activities within 100 feet of a public road. Refer to the Emery County letter found in Appendix 1-4.

116. Permit Term.

116.100. The anticipated starting and termination dates of the coal mining and reclamation operation are as follows:

<u>Phase</u>	<u>Begin</u>	<u>Complete</u>
Mining Pad, Support Structures, and Portals	June 2005	Dec. 2005
Begin Underground work	June 2005	
Terminate Mining	Dec. 2019	

Reclamation operation dates can be found in Table 3-3.

Approximately ~~54,992,663.073~~ surface acres, which include federal, state and private lands, are included within the permit area. These surface acres are described in Table 4-2, and coal acres within the permit area are shown on Table 4-2A. Coal lease acres exist outside the permit area, see Plate 5-4.

The perimeter of the surface facilities' disturbed area boundary (see Plate 5-2) contains approximately ~~42.6 surface acres~~ 37.7 acres. Within the disturbed area boundary, only approximately 33.7 acres are actually disturbed; leaving approximately 4.0 acres of undisturbed area within the disturbed area ~~but only 33.9 acres will be disturbed leaving 8.7 acres of undisturbed islands within the disturbed area~~ boundary.

116.200. The initial permit application is for a five year term with anticipated successive five year permit renewals.

116.210 Since the initial permit application is for a term of five years this section does not apply.

116.220 Since the initial permit application is for a term of five years this section does not apply.

117. Insurance, Proof of Publication and Facilities or Structures Used in Common

- 117.100.** The Certificate of Liability Insurance is included as Appendix 8-2.
- 117.200.** A copy of the newspaper advertisement of the permit extension and proof of publication can be found in Appendix 1-5.
- 117.300.** Since no structures are going to be shared by two or more separately permitted coal mining permit applications this section does not apply.

118. Filing Fee.

A filing fee of \$5.00 has been submitted.

120. Permit Application Format and Contents.

- 121.** The permit application contains current information and is written in a clear and concise manner in a format satisfactory to the Division.
- 122.** Referenced materials not on file at the Division, or readily available to the Division, will be provided upon request of the Division by the applicant. On August 22, 2000 Dave Darby confirmed a copy of the R2P2 is on file at the Salt Lake City Division office.
- 123.** A notarized statement, attesting to the accuracy of the information can be found in Appendix 1-5.

130. Reporting of Technical Data.

- 131.** Persons or organizations that collected or analyzed data, the dates

associated with the collection and/or analysis of the data, can be found in Appendix 1-5.

132. Resumes for the professional qualified persons who planned, directed the collection of or analyzed data can be found in Appendix 1-5.

140. Maps and Plans.

141. Maps have been presented in a consolidated format, to the extent possible, and include all the types of information that are set forth on U.S. Geological Survey of the 1:24,000 scale series. Maps of the permit area are to the scale of 1:6,000 or larger. Maps of the adjacent area will clearly show the lands and waters within those areas.
142. Maps and plans submitted with the permit application distinguish among each of the phases during which coal mining and reclamation operations were or will be conducted at any place within the life of operations.

150. Completeness

This permit extension to the existing Horse Canyon Permit ACT/007-013 to conduct coal mining and reclamation operations is complete and includes the minimum information required under R645-301 and, if applicable, R645-302. Plates 1-1 and 1-2 show the ~~permitted~~ permit area and proposed disturbed area boundaries.

~~This permit extension is intended to add~~ This permit was originally submitted including "Part 'A'" (the original Horse Canyon Mine permit area) and "Part 'B'" (the extension of the Horse Canyon Mine permit for the Lila Canyon Mine as p). Part "B" to the existing permit and to leave unchanged the current approved Horse Canyon Mine as part "A". The Horse Canyon Mine "part A" is for reclamation only.

'A' has received Phase III bond release and has been removed from the permit area. Part 'A' is included only for historical and reference data. The formerly referenced Part 'B' is the permit area henceforth. References to Part 'B' shall be construed as the permit area.

Permit Area Legal Description (formerly Permit Area 'B')

T16S R14E

<u>Section 10:</u>	<u>Portions of SE1/4</u>	<u>76.0 Acres</u>
<u>Section 11:</u>	<u>E1/2; Portions of W1/2</u>	<u>450.1 Acres</u>
<u>Section 12:</u>	<u>All</u>	<u>640.0 Acres</u>
<u>Section 13:</u>	<u>All</u>	<u>640.0 Acres</u>
<u>Section 14:</u>	<u>All</u>	<u>640.0 Acres</u>
<u>Section 15:</u>	<u>Portions of E1/2; Portions of SW1/4</u>	<u>277.5 Acres</u>
<u>Section 22:</u>	<u>NE1/4 NE1/4</u>	<u>40.0 Acres</u>
<u>Section 23:</u>	<u>N1/2; SE1/4; E1/2 SW1/4</u>	<u>560.0 Acres</u>
<u>Section 24:</u>	<u>All</u>	<u>640.0 Acres</u>
<u>Section 25:</u>	<u>N1/2</u>	<u>320.0 Acres</u>
<u>Section 26:</u>	<u>E1/2 NE1/4</u>	<u>80.0 Acres</u>

T16S R15E

<u>Section 19:</u>	<u>W1/2 SW1/4; SE1/4 SW1/4</u>	<u>110.0 Acres</u>
<u>Section 30:</u>	<u>NW1/4; SW1/4 NE1/4</u>	<u>190.0 Acres</u>

Existing Permit Total Area: 4,663.6 Acres

Proposed Incidental Boundary Change

<u>T16S R14E; Sec. 26:</u>	<u>NW1/4NE1/4</u>	<u>40.0 Acres</u>
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Proposed New Permit Total Area: 4,703.6 Acres

Former Permit Area 'A' (for historical and reference data purposes only)

Beginning at the SW corner of the SE1/4 SE1/4 of Section 5, T16S, R14E, SLBM; and running thence North 700 feet; thence East 2700 feet; thence North 700 feet; thence East 2025 feet; thence North 550 feet; thence approximately N50°E 4957 feet, more or less; thence approximately N18°W 1228 feet, more or less; thence East 256 feet; thence approximately N18°W 1328 feet, more or less; thence approximately N66°E 682 feet, more or less; thence approximately N11°E 636 feet, more or less; thence approximately N79°W 116 feet, more or less; thence approximately N11°E 1787 feet, more or less; thence approximately S88°E 1023 feet, more or less; thence South 272 feet; thence East 283 feet; thence South 2027 feet; thence East 278 feet; thence approximately S18°E 2111 feet, more or less; thence approximately N72°E 131 feet, more or less; thence approximately S18°E 222 feet, more or less; thence approximately N69°E 2218 feet, more or less; thence approximately N19°W 1092 feet, more or less; thence approximately N67°E 693 feet, more or less; thence East 160 feet; thence approximately S23°E 2921 feet, more or less; thence approximately S60°W 297 feet, more or less; thence South 353 feet; thence West 1071 feet; thence South 301 feet; thence East 450 feet; thence South 370 feet; thence West 322 feet; thence approximately S19°E 1451 feet, more or less; thence approximately S86°E 1200 feet, more or less; thence approximately S35°E 667 feet, more or less; thence

approximately S04°W 1012 feet, more or less; thence approximately N87°W 2780 feet, more or less; thence approximately S20°E 2330 feet, more or less; thence approximately N66°E 1090 feet, more or less; thence approximately N24°W 710 feet, more or less; thence approximately N66°E 484 feet, more or less; thence approximately S24°E 618 feet, more or less; thence approximately S66°W 283 feet, more or less; thence approximately S24°E 610 feet, more or less; thence approximately S66°W 414 feet, more or less; thence approximately N24°W 170 feet, more or less; thence approximately S66°W 898 feet, more or less; thence approximately S20°E 1177 feet, more or less; thence East 383 feet; thence South 168 feet; thence East 549 feet; thence South 2827 feet; thence approximately S73°W 341 feet, more or less; thence approximately N10°W 1155 feet, more or less; thence approximately N23°W 1306 feet, more or less; thence approximately S67°W 2297 feet, more or less; thence approximately N20°W 181 feet, more or less; thence approximately S70°W 1940 feet, more or less; thence approximately S20°E 1274 feet, more or less; thence approximately S30°W 427 feet, more or less; thence approximately N20°W 1916 feet, more or less; thence approximately N70°E 2276 feet, more or less; thence approximately N20°W 5822 feet, more or less; thence West 2020 feet; thence South 418 feet; thence West 1350 feet; thence South 1400 feet; thence West 697 feet to the NW corner of the NE1/4 NE1/4 of Section 9, T16S, R14E, SLBM; thence South 1400 feet; thence West 5400 feet; thence North 1400 feet to the Point of Beginning.

Less the following portions thereof:

(a) Beginning approximately 276 feet South and approximately 55 feet West of the NE corner of the NE1/4 SW1/4 of Section 3, T16S, R14E, SLBM; thence approximately S42°W 186 feet, more or less; thence West 942 feet; thence approximately N30°W 277 feet, more or less; thence North 714 feet; thence East 653 feet; thence North 882 feet; thence approximately S18°E 1785 feet, more or less to the Point of Beginning.

(b) Beginning approximately 263 feet South and approximately 540 feet East of the NW corner of the NW1/4 SE1/4 of Section 3, T16S, R14E, SLBM; thence approximately N18°W 2329 feet, more or less; thence East 340 feet; thence North 1157 feet; thence West 704 feet; thence approximately N20°W 762 feet, more or less; thence approximately N75°E 1443 feet, more or less; thence approximately S18°E 2137 feet, more or less; thence approximately S68°E 256 feet, more or less; thence approximately S18°W 2453 feet, more or less; thence West 1705 feet to the Point of Beginning.

© Beginning approximately 286 feet West and approximately 437 feet North of the SE corner of the NW1/4 SE1/4 of section 3, T16S, R14E, SLBM; thence East 1281 feet; thence approximately S20°E 4945 feet, more or less; thence approximately S67°W 1527 feet, more or less; thence approximately N20°W 4978 feet, more or less; thence approximately N14°E 582 feet, more or less to the Point of Beginning.

Emery County Road to be Excluded.

A strip of land, 100.0 feet wide, 50.00 feet on each side of the centerline of the Emery County roads within the above described permit boundary.

WordPerfect Document Compare Summary

Original document: K:\Lila\2016\L16-001 Ventilation Breakout and Removal of Part A and B References\Deficiencies Task 5081\Originals\Chapter 2.wpd

Revised document: K:\Lila\2016\L16-001 Ventilation Breakout and Removal of Part A and B References\Deficiencies Task 5081\Chapter 2 Edits.wpd

Deletions are shown with the following attributes and color:

~~Strikeout~~, **Blue** RGB(0,0,255).

Deleted text is shown as full text.

Insertions are shown with the following attributes and color:

Double Underline, Redline, **Red** RGB(255,0,0).

The document was marked with 3 Deletions, 2 Insertions, 0 Moves.

**Horse Canyon Extension
Lila Canyon Mine**

**Chapter 2
Soils**

Volume 1 of 7

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Appendix 2-2	Soil Descriptions NRCS
Appendix 2-3	Soil Survey (1998)
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Appendix A2	Salvaged Soils Map

R645-301-200. Soils.

210. Introduction.

- 211.** Premining soil sources description.
- 212.** Information in this chapter includes soil characteristics, chemical and physical analyses, and their interpretations for soils management and reclamation plans. Information is both qualitative and quantitative in nature.

Evaluation of suitable soil materials, stockpiling, and reclamation procedures are presented in section 220, 230, 240 and 250.

220. Environmental Description.

Environmental setting:

The proposed Lila Canyon Mine location is in eastern Emery County, Utah on the east side of the Price River drainage basin at the western edge of the Book Cliffs. The Book Cliffs are oriented northwest-southeast in the vicinity of the proposed permit area. The mine surface facilities would be located at the mouth of Lila Canyon, mostly on an alluvial pediment surface. Lithology is primarily sedimentary rocks of sandstone and shale. Below the steep slopes of the Book Cliffs are alluvial pediments and shale exposures. The elevation differences in the area of the mine site range from approximately 5,800 at the mouth of Lila Canyon to over 8,800 feet on top of Lila Point. Elevations of the proposed mine facilities site range from 5,800 feet to 6,500 feet.

The average annual precipitation in the area of the mine site is 12-14 inches with the majority of the precipitation occurring from October to March. The mean annual air temperature is 45-47 degrees F and the average frost-free period is 80 to 120 days. The basic vegetation is a pinyon-juniper and grass type.

221. Prime Farmland Investigation.

A Prime Farmland Investigation was conducted by Leland Sasser, Soils Scientist for the USDA Natural Resource Conservation Service (NRCS) in January of 1998. Mr. Sasser confirmed that no such lands

are present with the described permit area. This is due to the lack of a developed irrigation system on the arid soils present, as well as the high erodibility of soils present within the area. It has been determined that no alluvial valley floors are present on the proposed disturbed areas of the Lila Canyon Mine Project. This determination was made by the use of detailed soil surveys and site observations. Also, the order 3 intensity level soil survey by the National Resources Conservation Service shows no alluvial valley floors in the area. A copy of these negative determinations is included as Appendix 2-1.

222. Soil Survey.

222.100. An order 3 intensity level soil survey for Emery County is currently in progress by the USDA, National Resources Conservation Service (NRCS). Soil mapping at a scale of 1:24,000, along with map unit descriptions, has been provided by NRCS to cover the entire Lila Canyon Mine project area. This soil map is presented as Plate 2-1. The detail is suitable for general planning and evaluation purposes over the mining project area.

Since more specific information was needed for the area to be disturbed at the proposed mine facilities site; a detailed soil survey was conducted by Daniel Larsen, Soil Scientist, Environmental Industrial Services in August 1998. Additional information was collected near the ventilation break outs on June 15, 1999. The detailed soil survey report is presented in Appendix 2-3. A soils map, soil descriptions, and laboratory soil testing data are included. The detailed soils map for the mine facilities site (disturbed area) is presented in Plate 2-2.

222.200. Soil types for the proposed project area are identified on Plate 2-1 and in Appendix 2-3. At the mine facilities site the dominant soil is the Strych series. The order 3 intensity soil survey information provided by the Natural Resources Conservation Service identifies four soil map units at the mine surface facilities site:

BNE2	Strych very bouldery, fine sandy loam, 3 to 20 percent slopes
BMD	Strych very stony fine sandy loam, 3 to 30

	percent slopes
NGG2	Gerst-strych-badland complex, 30 to 70 percent slopes
RZH	Rock outcrop-Atchee-Rubbleland Complex

The detailed soil survey of the facilities site identifies six soil map units:

SBG - Strych boulder fine sandy loam, 5 to 15 percent slopes (grass)

VBJ - Strych very bouldery fine sandy loam 5 to 15 percent slopes (juniper)

XBS - Strych extremely bouldery sandy loam, 10 to 45 percent slopes

RBL - Rubbleland-Strych-Gerst complex, 20 to 70 percent slopes

DSH - Strych fine sandy loam variant, 3 to 8 percent slopes

RBT - Rock outcrop - Travessilla family complex.

These unit designations are specific to this inventory. The Travessilla family has been revised by NRCS and based the changes the Atchee series is more appropriate in Map Unit RBT (personal conversation with Leland Sasser. July, 1999).

Permit Area "B" Soils

Soils in Permit Area "B" include the following Soil Map Units identified in the Soil Survey of the Emery Area, Utah by the Natural Resource Conservation Services:

DHG2	Comodore-Datino Complex
------	-------------------------

DSG 2 (HUG)	Midfork-Tingey-Comodore Complex
GNA	Neto fine sandy loam
KXH	Podo-Rock outcrop Complex
MHE (MSC)	Podo sandy loam, 1 to 8 percent slopes
MRG	Vassilla-Rock outcrop-Gerst Association
MTH	Cabba-Guben-Rock outcrop Complex
MUE	Cabba-Podo-Doney Complex
NGG2	Gerst-Strych-Badland Complex
NVF2	Gerst-Rubbleland-Badland
NXC	Lazear-Rock outcrop Complex, High rainfall
RR	Rock outcrop
RWG	Rock outcrop-Rubbleland-Vassilla Complex
RZH	Rock outcrop-Atchee-Rubbleland Complex
UMF2	Guben-Pathead-Rabbitex Association
VOH	Guben-Rock outcrop Complex

222.300. Soil descriptions from the NRCS order 3 mapping are contained in Appendix 2-2. Soil descriptions from the detailed soil survey of the facilities site are given in Appendix 2-3.

The soils at the proposed Lila Canyon mine facilities site have formed dominantly in deep, stony and bouldery deposits on an alluvial fan and adjacent mountain toe slopes under a semi-arid climate. Rock fragments (gravel to boulders) are composed almost entirely of sandstone.

Notable features related to soils at the site are the high percentage of stones and boulders that are present on the surface and the relatively hot and dry site conditions. Minimal topsoil development and an accumulation of carbonates in the subsoil are typical characteristics of these soils along with a high rock fragment content. Soil textures are typically fine sandy loam or sandy loam. Thin layers of sandy clay loam and

loamy sand are intermittently present.

The dominant soils are well drained and have moderately rapid permeability. Soil erosion potential is moderately low over most of the area, but ranges from low to severe (on shale exposures). Rooting depths observed were mostly at 30 to 48 inches.

222.400 Present and potential productivity determinations of the existing soils conducted by Mr. George Cook of the NRCS in the summer of 1998 are presented in Appendix 3-2.

223. The soil survey was conducted according to the standards of the National Cooperative Soil Survey as described in the Soil Survey Manual (Soil Survey Staff, 1993), the National Soil Survey Handbook, (soil Survey Staff, 1993), and Keys to Soil Taxonomy, seventh edition (Soil Survey Staff, 1996).

224 Soil inventories indicate that no borrow area will be needed for substitute topsoil. There is an adequate amount of suitable soil as indicated by root distribution and soil characteristics over the proposed area to be disturbed.

230. Operation Plan.

231. General Requirements.

231.100 In reference to topsoil in this plan, it is considered to be the soil down to a maximum depth of 18". The typically dark colored A horizon often referred to as topsoil is very thin (< 6 inches) under the environmental conditions of the project site. Topsoil generally consists of the A and B horizon materials that have suitable characteristics for plant growth and show natural rooting present within the soil. Of the salvageable soil identified, the upper 6 to 12 inches is the most suitable. Below this depth, there is generally an increase in carbonates and rock fragments. However, this layer supports plant roots and is not considered as substitute topsoil in this case.

Where topsoil is to be salvaged, the soils will be removed with

one or more of the following types of equipment: crawler-tractor, grader, front-end loader, and/or trackhoe. A soil scientist will provide on-site consultation during the topsoil removal process to maximize harvest of quality topsoil. Topsoil material will be hauled by truck and stockpiled at designated storage areas located near, but away from the mine yard. This will allow the soil materials to be located away from mining activities to minimize the potential impacts from mine-related activities. The storage areas will be located away from any drainage areas. Drainage ditches will be located along the sides of the stockpiles to divert drainage away from the stockpile surface. Drainage will be diverted by ditches to the downslope end of the stockpile and will be treated by silt fences prior to entering the undisturbed drainage. Refer to Plates 5-2 and 5-7 for the location of the proposed topsoil storage area. Refer to Appendix 7-4 for details of the drainage control designs proposed for these alternate sediment control areas (ASCAs).

During stripping and handling the soils will be in a loose or friable condition. If the soil sticks to the equipment, the soil will be allowed to dry to a friable state prior to removal. If the soil is too dry and hard to handle, water will be added until the soil is wetted to a loose and friable condition.

The stockpiled material will be loosely piled and have an irregular, pitted surface to help retain runoff from precipitation events and to reduce erosion.

The stockpile will be seeded and mulched during the first favorable period for revegetation. Species selected would give an effective, quick-growing vegetative cover to protect it from wind and water erosion. The seed mix to be utilized for stockpile revegetation is presented in Table 3-4. If supplemental seeding is needed, it will be done the following year. If seeding does not immediately follow topsoil pile construction, the pile will be roughened again immediately prior to seeding. Side slopes will be monitored for erosion and will be repaired if erosion appears to be excessive.

Undisturbed islands located within the disturbed area will not be disturbed unless the mine reclamation plan is amended to allow for the disturbance. The islands will be signed as

undisturbed to help protect them from any disturbance.

231.200. Soil inventories indicate that no topsoil substitutes will be needed.

231.300. Topsoil will be tested as per Section 243. If testing identifies a potential problem, additional samples may be collected to determine the extent and severity of the problem.

Vegetation monitoring will compare the results of plant growth on the replaced topsoil with the growth on the in-place soil materials. If there is a distinct difference between the two areas, the Operator will consult with the DOGM to determine the nature of the problem and will make corrections as recommended for improvement.

231.400. Construction of the topsoil storage site will begin by removing any large boulders and existing vegetation. Diversion ditches will be installed after the stockpiles are in place to channel drainage away from the stockpiles. Once the topsoil stockpile has been created with the material removed during construction of the proposed mine site, it will be reseeded and will remain in place until final reclamation occurs.

The surface of the stockpile will be left rough and irregular to increase retention of rainfall and snow melt. Seeding will be done following placement of the topsoil, and between Sept. 15 and Jan. 15, to take advantage of winter moisture. If seeding does not immediately follow topsoil pile construction, the pile will be roughened again immediately prior to seeding.

A silt fence or berm/ditch configuration will be installed at the perimeter of the pile to protect it from water erosion and vehicular traffic. Maintenance of the topsoil pile, during the life of the mining operation, will consist of: seeding the new stockpile, reseeded if erosion or other elements cause a loss of vegetation, and maintenance of the ditches and/or silt fence in the stockpile areas.

232. Topsoil and Subsoil Removal

232.100 Prior to topsoil removal, eight five gallon buckets of screened 1/4" cryptobiotic soil will be recovered and stored in a cool dry

place for redistribution on the topsoil pile. Topsoil material will be removed from those areas of the mine yard where material will be excavated in order to achieve final yard configuration and which have been identified as suitable topsoil for reclamation based on the soil survey. This includes the access road to and around the topsoil pile. This material will be used to construct a berm around the topsoil pile.

The following volumes represent soil resources that may be available for salvage, storage and subsequent redistribution during reclamation. The actual amount salvaged will be reported to DOGM following topsoil removal and stockpiling operations.

AVAILABLE SOIL RESOURCES

Map Unit	Potential Salvage Depth In.	Potential Acres	Potential Estimated Volume YD3	Actual Salvage Depth In.	Actual Salvaged Acres	Actual Salvaged Top Soil YD3
SBG	48	11.83	76343	18	11.61	28100
VBJ	30	9.62	38801	18	3.40	8227
XBS	12	12.09	19505	12	8.81	14207
DSH	40	1.56	8389	18	1.16	2809
RBL	8	9.34	10046	8	2.17	2340
RBT	6	3.79	3057	6	0.56	450
TOTAL⁽²⁾		48.23	156141		27.95	56133
Bank to Loose Cubic Yards *1.18 (Amount topsoil pile is designed to hold.)						⁽¹⁾ 66237

(1) An additional 800 yd³ will come from the access road around the topsoil pile. This material will be placed in the berm around the topsoil pile.

(2) The 48.23 acres was taken from a soil survey and does not accurately reflect the operators intention to include 42.6 acres of disturbance within the disturbed area boundary.

The actual topsoil salvage will consist of removing a surface layer up to 18 inches thick over the disturbed area. If shale is encountered within 18 inches only the soil above the shale will be salvaged. (Plate 2-3). This would cover about 34 acres where soil would be salvaged and stored in the topsoil stockpile.

Total volumes of soil stored in the topsoil pile would be

approximately 56,000 bank cubic yards. Removal of stones and boulders would be considered in volume estimates where they are part of the soil layer removed.

The stockpile has been sized to allow for bulking or swell of the soil as it is removed from the bank state to the loose state. A bulking number of 1.18 has been used. The area allowed for topsoil storage is 56,000 bank cubic yards x 1.18 which equals 66,000 loose cubic yards to be placed on the topsoil pile.

Boulders of approximately three feet in diameter and larger will be separated from the topsoil and piled or placed at appropriate locations such as adjacent to roads, pads etc. No attempt will be made to collect the large boulders into common piles. Boulders above ground level are in addition to topsoil volumes and may account for approximately 10,000 cubic yards.

UEI is not stockpiling large stones "boulders". Boulders will be pushed to the side and left during construction and then upon reclamation the boulders will be pushed back into the approximate location from which they came. Rocks of 36" or less will be stored in the topsoil pile with the soil and will be redistributed with the soil.

The approximate 66,000 loose cubic yards of topsoil will be stored in a topsoil pile as shown on Plate 5-2. This topsoil pile will be approximately 350' long and 250' wide with 2:1 slopes. The height of topsoil pile needed is approximately 31 feet. The pile as designed has the capability of storing well over the required 60,000 cubic yards. See Figure 1 for topsoil pile calculations.

Soil from the proposed ventilation break out sites near the coal outcrop will not be salvaged. The slope above the north breakout fan is approximately 70%. Rock cover on the surface is approximately 60%. As a result of the very limited ground disturbance, and lack of access, soil cannot be reasonably salvaged. At these small isolated sites soil will not be salvaged or stored (See R645-301-232.700 and 232.710).

The sequence for topsoil removal in general, would be starting from the lower elevations of the site and working up slope.

Surface disturbance may not be required on all of the acreage identified as the disturbed area. After removal of the topsoil to be salvaged, underlying soil materials will be used as fill or left in place.

All practical precautions will be taken during design, construction, and reclamation to assure that shales or shale material will not be pushed over the top of or mixed with subsoils. Contamination of the subsoil with shale will not be permitted. The certified soils specialist, or by a person who is determined qualified by the operator and the Division, on site during the construction and reclamations phases will carefully observe the construction and reclamation phases and prevent to the extent possible the mixture of shales and subsoils. Additional topsoil removal, in excess of 18" minimum, may be necessary to prevent the shale from contaminating the subsoil.

232.200. Since topsoil is sufficient this section does not apply.

232.300. The surface soil down to 18" or to the shale which ever is the least will be removed and stored.

232.400. This section is addressed in 232.700.

Lila Canyon Topsoil Calculations

Pile Elevation In Feet	Pile Length In Feet	Pile Width In Feet	Volume L X W CYDS	Volume Ends CYDS	Total Volume Cumulative Cubic Yards
	350	250	3240.74		3240.74
1	346	246	3152.44	22.07	6415.26
2	342	242	3065.33	21.78	9502.37
3	338	238	2979.41	21.48	12503.26
4	334	234	2894.67	21.19	15419.11
5	330	230	2811.11	20.89	18251.11
6	326	226	2728.74	20.59	21000.44
7	322	222	2647.56	20.30	23668.30
8	318	218	2567.56	20.00	26255.85
9	314	214	2488.74	19.70	28764.30
10	310	210	2411.11	19.41	31194.81
11	306	206	2334.67	19.11	33548.59
12	302	202	2259.41	18.81	35826.81
13	298	198	2185.33	18.52	38030.67
14	294	194	2112.44	18.22	40161.33
15	290	190	2040.74	17.93	42220.00
16	286	186	1970.22	17.63	44207.85
17	282	182	1900.89	17.33	46126.07
18	278	178	1832.74	17.04	47975.85
19	274	174	1765.78	16.74	49758.37
20	270	170	1700.00	16.44	51474.81
21	266	166	1635.41	16.15	53126.37
22	262	162	1572.00	15.85	54714.22
23	258	158	1509.78	15.56	56239.56
24	254	154	1448.74	15.26	57703.56
25	250	150	1388.89	14.96	59107.41
26	246	146	1330.22	14.67	60452.30
27	242	142	1272.74	14.37	61739.41
28	238	138	1216.44	14.07	62969.93
29	234	134	1161.33	13.78	64145.04
30	230	130	1107.41	13.48	65265.93
31	226	126	1054.67	13.19	66333.78
32	222	122	1003.11	12.89	67349.78
33	218	118	952.74	12.59	68315.11
34	214	114	903.56	12.30	69230.96
35	210	110	855.56	12.00	70098.52

Figure 1

232.410. This section is addressed in 232.700.

232.420. This section is addressed in 232.700.

232.500. Topsoil will be considered as the upper 18 inches of soil in most cases. 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.

In order to verify subsoil depths, soil pedestals or other survey methods will be utilized for proper identification. Pedestals of undisturbed soil will be left at selected locations as reference points to show the type of soil thickness that has been removed from the slope cut areas. Records will be maintained to keep track of what materials are removed and where they are placed (topsoil storage or fill). Pedestals will vary in size depending on depth of cut. They will be designed to maintain stability of the soil column.

These soil pedestals may have to be removed once they have been properly logged to facilitate the mining operation.

An As-Built map will be prepared to show where soil materials have been used as fill material. This will include thickness records for topsoil, subsoil, and substrata. This information will be used to verify subsoil salvage depths according to Salvageable Soils Map Appendix A-2 of Appendix 2-3. This as built map will be incorporated into the Mining Reclamation Plan.

If shale is encountered in the slope cuts, the shale material will be separated from the other soil and returned to or near its original position upon reclamation.

Subsoils that are stored as pad material will be protected by a surface that is covered by asphalt, concrete, or gravel. The subsoil material will be under parking areas, buildings, roads, and storage sites. Graveled areas will have an impervious membrane placed between the subsoil and gravel. Precautions will be taken to avoid contamination. In the

unlikely event visual observations indicate that subsoil has become contaminated from oil and grease, salts, or other visual contaminants, the contaminated soil will be disposed of at a sanitary landfill site (probably East Carbon).

- 232.600.** Topsoil will be removed from excavation areas and stockpiled prior to construction activity. Vegetation and boulders that might interfere with topsoil salvage will be removed prior to removal and stockpiling of the topsoil.

The topsoil will be removed in two Phases. The first phase will remove topsoil, vegetation and boulders in an area large enough to allow for mining of diligence tons. The second phase which will remove the remainder of the approved topsoil and vegetation as per the MRP. The timing between phases is undetermined at this time and will be dictated by coal demand and market. The areas identified for disturbance left undisturbed after phase 1, will be treated as per the MRP.

- 232.700.** It is anticipated that topsoil can be salvaged on areas to be disturbed. Approximate thickness of subsoil by Soil Map Unit are: SBG - 30 inches, DSH - 22 inches, and VBJ - 12 inches.

- 232.710.** Soil removal from some local sites may be difficult due to rockiness and steep slopes. The area between the rock slopes and the ROM coal stockpile is an area of concern. In the area between the rock slopes and ROM coal stockpile the disturbance is minimal. The topsoil will not be removed from this area due to steep slopes. To protect this area from coal contamination the conveyor will be enclosed. Jersey Barriers will be installed to prevent the coal stockpile from encroaching this area. Topsoil will be removed in all areas of disturbance except for the area between the ROM coal pile and the rock slopes where either one or two bents will be constructed. Available underlying soils will be salvaged from stony disturbed areas. Areas too steep and rocky for equipment and where it would be unsafe or impractical for construction activities (approximately 5.95 Acres) will not be included in the site development plan.

232.720. No substitute soil materials will be needed.

233. Topsoil Substitutes and Supplements.

233.100. Soil inventories indicate that no substitute topsoil material will be necessary. Available soil material on the site is adequate for reclamation purposes. [See Appendix 5-9 for Ventilation Breakout volume estimates and source fill information.](#)

233.200 Preliminary inventories show that no topsoil borrow area is needed.

233.300. This section is addressed in 233.400.

233.310. This section is addressed in 233.400.

233.320. This section is addressed in 233.400.

233.330. This section is addressed in 233.400.

233.340. This section is addressed in 233.400.

233.400 Soil Inventories show that no topsoil or topsoil substitute borrow area will be needed. Adequate amounts of suitable soil for plant growth are present based on root distribution and soil characteristics.

234. Topsoil Storage.

234.100. It will not be possible to redistribute the topsoil immediately. Therefore, the topsoil will be stockpiled for the purpose of final reclamation of the mine site. The rock storage areas are shown on Plate 5-2.

Access to the ventilation break outs will be from inside the mine.

There will be minimal surface disturbance with the breakouts so no topsoil will be salvaged. Refer to the Surface Area map Plate 5-2 for the approximate location of the ventilation breakouts.

Presently there is not a subsoil stockpile required for this project, therefore, details are not provided.

234.200. Section 232.100 contains information on the topsoil stockpile.

234.210. The stockpile site selected is on the Strych soil. It is a well drained and stable site on cobbly alluvium.

234.220. The stockpile will be located and protected to avoid contamination. Unacceptable compaction will not be permitted. In areas where undisturbed soils are in close proximity to coal mining or reclamation activities, "Undisturbed Area" signs will be placed at or near the contact between disturbed and undisturbed. Quarterly inspections will be made to insure there is not an accumulation of coal dust or coal related debris. In the event coal dust is observed, water sprays according to air quality permit (DAQE-702-99) or alternative measures such as wind fence, or broadening of the topsoil salvage area will be employed to control the coal dust and fines.

234.230. The stockpile will be mulched and seeded with the seed mix presented in Table 3-4. Up to 1% by volume of the sifted soil crusts will be added to each load of Wood fiber mulch applied to the top soil pile. The slopes will have an irregular, pitted surface to help retain precipitation and minimize runoff. Silt fencing will be placed at the base of the stockpile.

234.240. Plans are to leave the topsoil in place for the life of the mine.

- 234.300.** These regulations are not applicable to the action described within this permit document.
- 234.310.** These regulations are not applicable to the action described within this permit document.
- 234.320.** These regulations are not applicable to the action described within this permit document.

240. Reclamation Plan.

- 241.** Reclamation of the proposed disturbed area will begin once all surface facilities and structures have been demolished and removed. Disturbed areas will be restored to approximate original contour. Disturbed areas will be re-graded using pad material. Subsoil from Soil Map Units SBJ, DSH, and VBJ that are used as construction fill will be identified and used during reclamation as root zone subsoils. This information will be collected during the original grading operation and incorporated into the As-Built drawing referred to in Section 232.500. The grading sequence with regards to subsoil will be as follows:
- a. Grade all areas where no subsoil is being stored.
 - b. Replace subsoil on areas from which it was removed.
 - c. Rip the subsoil to a minimum of 16 inches.
 - d. Replace topsoil.
 - e. Replace boulders
 - f. Gouge the topsoil.

After the disturbed areas have been recontoured and retopsoiled they can then be revegetated.

Sediment control during reclamation will be met by continued use of the sediment pond located below the yard area. All main culverts and an adequate amount of fill to maintain existing headwalls will be left intact during this reclamation phase.

After approximate original contour (AOC) is achieved, the surface will be prepared. The soil will be sampled in a maximum of five locations to be determined jointly by the Division and the Operator. The sampled soil will be analyzed for the parameters described in tables 3 and 7 of the January 2008 "Guidelines for Management of Topsoil and Overburden".

Where practical, the disturbed area will be scarified prior to soil redistribution.

The rippers found on the rear of a cat will be used to scarify the disturbed area. The total surface where practical will be ripped on a maximum spacing of 6' to a depth of 16 inches. Pocking, after topsoil redistribution, will be the primary method used to roughen the surface. Pocking consists of imprinting the surface with a pattern of depressions as per Figure 1 in Appendix 5-8. The purpose of these pocks is to capture and retain water (moisture), and provide a cradle for seedlings and other plant materials. To enhance the ability of the soil to absorb moisture, best technology currently available at the time of reclamation will be applied to the soil surface.

In order to regenerate naturally existing soil organisms and assist in reactivating soil activity, an inoculum will be applied to the soil to reestablish soil bacteria, microhorizia and mycelium. To enhance soil microbial establishment and promote more rapid stabilization of the soil the seed mixture (as listed in Chapter 3) will be either hand broadcast over the area or sprayed using a hydromulcher. A wood fiber mulch will be hydro sprayed over the seed bed, then the surface will be sprayed with a tackifier. See Appendix 5-8.

242. Soil Redistribution.

242.100 Topsoil materials that were previously stockpiled will be redistributed on the same areas in a thickness which approximates the reclaimed thickness on the scarified, postmining regraded surface. For example if 8" of topsoil is removed from one area and 16' from another area reasonable efforts will be made to replace 8" where the 8" was removed from and 16" where the 16" was removed from. (See Plate 2-3 Soil Salvage and Replacement). The material will be hauled to the regraded area by dump truck or loader. The material will be placed using a front-end loader, crawler tractor, and/or trackhoe on steeper slopes and/or crawler tractor on the flat areas. After the backfill is placed to approximate original contour and the topsoil is respread, the site will be revegetated. Boulders will be replaced to achieve a near natural surface condition. The backfill will include subsoil material which was used as fill during the operational phase. Using as-built drawings, refer to 232.500, the subsoil will be replaced to its approximate original position prior to replacement of topsoil from the topsoil stockpile. Subsoil will be replaced in its approximate position in the reconstructed soil profile.

242.110. This section has been addressed in 242.100.

242.120. This section has been addressed in 242.100.

242.130. This section has been addressed in 241.

242.200. This section has been addressed in 242.100.

242.300. This section has been addressed in 242.100.

242.310. This section has been addressed in 242.100.

242.320. This section has been addressed in 242.100.

- 243. Soil Nutrients and Amendments.** Nutrients and soil amendments will be applied to the redistributed material if deemed necessary by assessment of the laboratory analyses. Nutrients and amendments will be added, to make the redistributed soil similar to the undisturbed soils and aid in establishment of the vegetative cover. The nutrients will be added by hydro seeding.

The topsoil will be sampled and tested prior to replacement. Sampling will either be performed by a Certified Soil Scientist or by a person who is determined qualified by the operator and the Division. Grab samples will be collected from the stockpile after its height is reduced to 10 feet at the deepest end. Four or five grab samples should be sufficient to determine what the effects of darkness, compaction, and sterility have been on the fertility of the topsoil. The grab samples will be analyzed for nitrogen, phosphate and potassium. Fertilizer, if needed, will be applied to the topsoil prior to seeding and mulching activities.

244. Soil Stabilization.

244.100 Exposed surface areas will use vegetative stabilization where practical to control erosion and fugitive dust. Revegetative efforts (including regrading, topsoiling, fertilizing and mulching) will be conducted prior to the end of October.

244.200 After approximate original contour (AOC) is achieved, the surface will be prepared. Pocking will be the primary method used to roughen the surface. Pocking consists of imprinting the surface with a pattern of depressions as per Figure 1 in Appendix 5-8. The purpose of these pocks is to capture and

retain water (moisture), and provide a cradle for seedlings and other plant materials.

In the event that soil crusts form on the topsoil stockpile, the Permittee will add up to 2 ounces of the sifted soil crusts to each load of Wood fiber mulch which will be applied to the reclaimed areas that have been regraded and covered by topsoil or substitute topsoil. (See Appendix 5-8).

244.300. Any rills and gullies of an excessive nature, which form on regraded and retopsoiled areas and disrupt the approved postmining land use or cause or contribute to a violation of water quality standards for receiving streams, will be filled, regraded or stabilized. The area will then be reseeded.

244.310. This section has been addressed in 244.300.

244.320. This section has been addressed in 244.300.

250. Performance Standards.

251. All topsoil, subsoil and topsoil substitutes or supplements will be removed, maintained and redistributed according to the plan given under sections 230 and 240.

252. All stockpiled topsoil, subsoil and topsoil substitutes or supplements will be located, maintained and redistributed according to plans given under sections 230 and 240.

WordPerfect Document Compare Summary

Original document: K:\Lila\2016\L16-001 Ventilation Breakout and Removal of Part A and B References\Originals\Chapter 3.wpd

Revised document: K:\Lila\2016\L16-001 Ventilation Breakout and Removal of Part A and B References\Deficiencies Task 5197\Chapter 3 Edits Task 5197.wpd

Deletions are shown with the following attributes and color:

~~Strikeout~~, **Blue** RGB(0,0,255).

Deleted text is shown as full text.

Insertions are shown with the following attributes and color:

Double Underline, Redline, **Red** RGB(255,0,0).

The document was marked with 5 Deletions, 6 Insertions, 0 Moves.

**Horse Canyon Extension
Lila Canyon Mine**

**Chapter 3
Biology**

**Volume 2 of 7
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300. BIOLOGY

310. Introduction.

- 311. Vegetative, fish, and wildlife resources of the permit area and adjacent areas are described in section 320.
- 312. Potential impacts to vegetative, fish and wildlife resources and methods proposed to minimize these impacts during coal mining and reclamation operations are described in sections 330 and 340.
- 313. Proposed reclamation designed to restore or enhance vegetative, fish and wildlife resources to a condition suitable for the designated post-mining land use are described under section 340.

320. Environmental Description.

- 321. Vegetation Information: The permit application contains the following vegetation information.

321.100. This section presents a discussion of the vegetation resources in the Lila Canyon Mine Extension Area and adjacent areas. The work was authorized initially by Kaiser Steel Corporation in 1982 and was referred to as the "South Least Tract." In 1985 Kaiser Coal incorporated a portion of the data from the South Lease and expanded it to include the Horse Canyon mine permit area. In 1990 this data was again updated and used to formulate the Mine Reclamation Plan for the Horse Canyon mine site and adjacent disturbance. This information can be found in the Horse Canyon MRP.

The Lila Canyon mine permit area encompasses a portion of the reclaimed Horse Canyon Mine and virtually all of the South Lease area (See Plate 1-1 Permit Area Map). Aerial photography was used to map the vegetation within the permit area.

A vegetation inventory was commissioned by UtahAmerican Energy, Inc. in 2003 to determine vegetation resources specific to the Lila Canyon Mine surface area. A copy of the report is included in Appendix 3-1.

As requested by the Division, Canyon sweetvetch, Cliffs

blazing star and creutzfeldt-flower will be surveyed for at least the year construction begins or one year prior to construction.

- 321.200.** A determination of the productivity of the land within and around the permit extension area was implemented by Dean Stacy, Range Management Specialist for the NRCS Natural Resources Conservation Service, and is included in Appendix 3-2. Productivity of the vegetation in the grass-shrub resource area was 450#/acre. The pinyon juniper area to be disturbed the production was estimated to be 250 to 350 #/acre. The pinyon Juniper area, within the disturbed area, will be reclaimed to a grass shrub community.
- 322.** Included in the permit extension application is fish and wildlife resource information for the extension area and adjacent areas.
- 322.100.** The scope and detail of the fish and wildlife resource information presented in this chapter is sufficient to design the protection and enhancement plan.
- 322.200.** Site specific resource information necessary to address the respective species or habitats is included.
- 322.210.** The United States Fish and Wildlife Service publish yearly, in the federal Register, lists of endangered and threatened species. TABLE 3-1 cites federally listed threatened or endangered species which may occur in this area of Utah. Three species listed are potential inhabitants of the general area of Lila Canyon; the black-footed ferret, MSO, and bald eagle.

The 2000 model for Mexican Spotted Owl Habitat was used to identify potential MSO habitat. The results can be found in Appendix 3-4.

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 verbal information from UEI's consultant, 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 have been a few willows or shrubs, but there were no dense patches as would be required by southwestern willow flycatchers.

Lila Canyon Mine will have ~~below-ground~~above-ground electrical power lines. These lines ~~will be constructed to minimize potential hazards to all raptors new to the site,~~ all will be designed and constructed in accordance with the guidelines set forth in Environmental Criteria for Electric Transmission Systems or as approved by DOGM.

322.220.

The permit area for Lila Canyon Mine is located within the Price River Resource Area. Surface water in the adjacent areas drains into Grassy Trail Creek and Cottonwood Wash, both tributaries of the Price River. The environment around the 42.6 acre mine site is within the Upper Sonoran life zone. The dominate Vegetation communities within the proposed disturbed area are pinyon-juniper and grass-shrub. Community types surrounding the proposed disturbed area are primarily pinyon-juniper, mixed conifer, spruce-fir, grass, and sagebrush-grass.

The Upper Sonoran life zone can provide habitat for approximately one hundred and forty-two species of wildlife. Two separate reports by the Utah Division of Wildlife Resources (DWR) identify species having potential to inhabit the region. The species that is considered to be of high interest in the local area is the Pronghorn. Pronghorns are found as year-long residents within and adjacent to the permit area. These-

animals were transplanted to this site by the DWR in 1972 and are part of the Icelander Antelope Herd Unit II. Pronghorn prefer open sagebrush-desert and shrub-grassland habitats in areas of the Western United States. They are primarily browsers but are known to forage on grasses and forbs during spring and summer (FWS, 1978).

The pinyon-juniper woodlands, and interspersed sagebrush parks are winter range for mule deer. Many of the drier slopes are essentially juniper stands of scattered trees. The mule deer winter use is restricted to periods when snow is available or surface water is present during snow melt in the early spring, and the UDWR has rated this winter range as high priority.

Elk winter range is located at higher elevations than that of the disturbed area and is not a factor in the disturbed site.

Other wildlife in the pinyon-juniper woodlands are reptiles, passerine birds, lagomorphs, and small rodents.

The talus slopes in the canyon are home to rodents and reptiles. They are also used by chukars. Snake dens are unknown in the talus slopes.

The cliffs are generally north-facing and have potential as raptor nesting sites. Spring raptor inventories were initiated in the spring of 1998. The results of the annual raptor surveys are included in Appendix 3-5. Raptor Surveys will be completed in the Spring of every year the Mine is active. In the event of a cessation, Raptor Surveys will stop until mining continues.

~~The intermittent / ephemeral stream channels~~

TABLE 3-1

FEDERALLY LISTED ENDANGERED AND THREATENED ANIMAL SPECIES

Mammals

Black-footed ferret (1) (Mustela nigripes)

Birds

Bald eagle (2) (Haliaeetus leucocephalus)

*Southwestern willow flycatcher (2)

Mexican Spotted Owl (3) (Strix occidentalis lucida)

Fish

Colorado squawfish (Ptychocheilus lucius)

Bonytail Chub (Gila elegans)

Humpback Chub (Gila cypha)

Razorback Sucker (Xyrauchen texanus)

(1) No confirmed sightings have occurred in Utah in recent years.

(2) Nests in Utah.

* No suitable nesting habitat within the permit area.

(3) Nests in Utah. (See Appendix 3-4 for Mexican Spotted Owl Habitat Survey Plan)

(A complete list of all potential T&E species found in Emery County is included in Appendix 3.3)

The intermittent / ephemeral stream channels lacks riparian vegetation; thus many bird species of high federal interest would not utilize this area example southwestern will flycatcher. The lack of trees or large shrubs precludes the use of woodpeckers. The stream channels do not support fish or an established invertebrate fauna.

The UDWR has submitted general information to be included in the wildlife plans of previous permit applications. Their information covers all the biogeological areas found on the Tavaputs Plateau which includes the Upper Sonoran, Transition, Canadian, and Hudsonian life zones. As noted previously only the Upper Sonoran life zone is represented within the permit area.

This UDWR general information is included in this application because it provides an overall description of the wildlife and wildlife habitats in the general area. The information is also useful in providing habitat information for design of the reclamation of the disturbed area. Thus the past wildlife habitat conditions can be emulated by reclamation and wildlife accommodated as they return to the mine site area upon final reclamation. (See Appendix 3-6, abbreviated)

The DWR has submitted information over the years in commenting on the various wildlife plans submitted in prior permit applications.

The ranking of wildlife values on coal-producing lands in Utah are found in Table 3-2 and are in the following list. The four rankings are in effect until June 30, 2006. The new rankings will have only two categories as shown.

Current

- 1 = Crucial-critical habitat
- 2 = High priority habitat
- 3 = Substantial value habitat
- 4 = Seasonal - Limited

After June 2006

1= Crucial

2= Substantial

Table 3-2 Ranking of Wildlife Habitat (Prior to 2004)

<u>Species</u>	<u>Management Area</u>
Rocky Mt. Big Horn (Seasonal)	5,411 Acres
Elk (Winter habitat)	19,840 Acres
Elk (Summer habitat)	1,280 Acres
Mule Deer (Critical)	9,280 Acres
Mule Deer (Year Long)	16,000 Acres
Pronghorn Antelope (Year Long)	12,160 Acres

It is important to note that the actual disturbed area (approximately 42.6 acres) is not critical elk or deer winter range but is habitat for Rocky Mountain Big Horn Sheep.

According to DWR, Rocky Mountain Bighorn Sheep spend all year along the escarpments in the Lila Canyon area of the Book Cliffs. DWR and the Division visited the proposed disturbed area on June 11, 2002. Prior to the visit, the DWR representative was concerned that sheep may need to move further up the cliff when traveling the escarpments because of the mine and that sheep would likely leave the area. After the visit, the DWR representative felt that the sheep use of Lila Canyon may not be affected. The change in opinion may be due to the fact that the DWR representative was not familiar with the specifics of the mine plan until the site visit.

Rocky Mountain Big Horn Sheep appear to have a low tolerance for disturbance. Considering the low population density and the abundance of suitable similar habitat this impact appears to be slight.

The loss of range for Big Horn Sheep is mitigated and is defined in the Environmental Assessment submitted in association with the Right-Of-Way applications.

The USFWS recognizes that the permit area is within range of endangered species, including the black-footed ferret, MSO, and the bald eagle (Letter dated February 4, 1998, Appendix 3-3).

Raptor surveys were initiated in 1998 and continue annually with the exception of 2004. These surveys were initiated before ground-breaking of the Lila project. The results of these surveys are in Appendix 3-5. The entire Book Cliffs escarpment within the permit area was inventoried for cliff nesting raptors. In addition, a 1-mile buffer zone was inventoried around areas of potential development.

An active golden eagle nest, with young, was documented during the 1999 spring raptor survey. In 2005 nest 946 contained a chick that was possibly dead. USFWS, Laura Roma, UDWR, Chris Colt, and BLM, Dave Mills determined, during the EA process, that there was a high probability these nest sites would be abandoned. A cooperative agreement with the regulatory agencies and UEI was finalized and is made part of the mitigation for the Lila Canyon EA. One nest discussed above, also lies in an area of potential subsidence which is a mute point due to its close proximity to the mine site. Since the nests are located so close to the mine surface facility and that there was a high probability these nest sites would be abandoned, these nests will be mitigated by a prey base off-site vegetation treatment project approved by the USFWS, UDWR and BLM (See page 19 for BLM mitigation information).

Although it was predicted that these nests might be abandoned, the Operator will coordinate closely with USFWS, DWR, and the Division to

avoid “take” of golden eagles prior to construction and during operations. Immediately following any raptor survey that shows that the eagles are tending nests or nesting, the operator will contact the USFWS and DOGM. The agencies will immediately coordinate to determine appropriate measures.

Although the Operator will avoid “take”, the operator agreed to the BLM-lead mitigation project that is based on the premise that there is sufficient nest sites in the area to accommodate the population base. The limiting factors appears to be available prey base. Mitigation is designed to enhance the prey base while concurrently enhancing habitat for big game, deer, elk, and bighorn sheep.

It is estimated that mining operations will use an average of approximately 81 acre feet of water annually. The USFWS considers that this volume of water will adversely affect the four endangered Colorado River fish. UEI will report actual water depletion values annually in their annual report.

The USFWS recovery program is reasonable and prudent alternative to avoid the likelihood of jeopardy to these fish.

- 322.230.** All known species or habitats needing special protection have been addressed.
- 322.300.** Copies of the MRP have been submitted to the Division to allow for distribution to USFWS.
- 323.** Maps or aerial photographs of the permit area and adjacent areas have been provided. Plates 3-1 and 3-1A are maps that show all critical habitat, raptor nests and all special habitat features. These plates will be updated on an as needed bases to reflect current conditions such as new raptor nests and/or changes in wildlife use.
- 323.100.** The location of the proposed reference area is shown

on Figure 1 of Appendix 3-1. Appendix 3-1 is the report for the 2003 vegetation inventory. The reference area for the mine site disturbance was established during the summer of 2003. The reference area was chosen in an area which represents the natural premining conditions of the permit area. The reference area will facilitate the determination of successful revegetation and the resultant final bond release for the Applicant.

- 323.200.** Monitoring locations are shown on Plate 3-1 and can also be found on the raptor inventory map in Appendix 3-5.
- 323.300.** Protection facilities: There will be no facilities used exclusively for the protection or enhancement of fish and wildlife.
- 323.400.** Plate 3-2 Identifies each vegetative type and plant community. The sample locations used during the vegetation inventory can be found on Figure 1 of Appendix 3-1. Wildlife use areas can be correlated to vegetation with the incorporation of the Wildlife Map, Plate 3-1.

Appendix 7-8 provides a description of each water monitoring location. In Summary monitoring locations L-6-G, L-7-G, and L-11-G have a habitat overstory of Douglas Fir-Mountain Brush association. Water monitoring location L-8-G has a habitat of predominantly pinyon - juniper and sagebrush grass associations. Water monitoring locations L-9-G, L-10-G, and L-12-G have some minor wet meadow habitat with an overstory of pinyon-juniper and sagebrush grass immediately adjacent along each side of the sites. Water monitoring sites L-16-G and L-17-G are both seeps and have a habitat of a mix of grasses and salt desert shrub with some invasive tamarisk.

Sites L-1-S, L-2-S, L-3-S, L-13-S, L-14-S and L-15-S are dry washes with a habitat consisting of sagebrush with an overstory of pinion-juniper.

Monitoring site L-4-S and L-5-G are for sediment pond

discharge and for the mine discharge and have a habitat consisting of an overstory of pinion-juniper.

330. Operation Plan. A plan for protection of vegetation, fish and wildlife resources follows:

331. The Lila permit area is approximately 4664.32 acres of which only 42.6 acres are within the surface disturbance area. All incidental disturbance, which will not be utilized in operations, will be revegetated with an interim seed mix proven beneficial to wildlife. The revegetation plan is addressed in Section 341 and the seed mixes are addressed in Tables 3-4 and 3-5. Revegetation will occur the first desirable period following disturbance and/or abandonment.

332. The extent and degree of subsidence will be in large dependent on both the amount of overburden as well as the mining method. Employees and or consultants of the operator have numerous years of experience mining the Bookcliffs and Wasatch areas and none have observed nor are aware of any negative impacts on wildlife or vegetation, as a result of subsidence, with the exception of

- 1) Escarpment Failure which is not anticipated.
- 2) Disruption of Surface and / or Ground Water, which is not anticipated.

(1) Escarpments will be protected by implementing escarpment barriers. An escarpment barrier of a minimum of 200', within which no second mining will take place, will be used to protect escarpments immediately above the coal seam and protect against unplanned holeouts.

(2) Disturbance of Surface and / or Ground Water. Considering, the permit area has no surface water with the exception of intermittent or ephemeral flow associated with precipitation events and / or snow melt, subsidence should have no adverse effect. The ephemeral stream channels, in the area's of potential subsidence, will be monitored to insure there are no adverse impacts to the ephemeral flow.

No negative impacts to vegetation are anticipated. However, vegetation will be monitored in conjunction with subsidence monitoring, utilizing infrared aerial photography once every five

years for those areas that are undermined. This will be done in accordance with the subsidence control plan. (See Section 525). Any loss of or diminished appearance of vegetation will be noted, confirmed on the ground, and a corrective plan to mitigate the loss will be submitted to the Division of Oil, Gas, and Mining for their approval and concurrence prior to implementation.

It is anticipated that the saturated zone will most certainly produce some water when intercepted in the course of mining. The effect could be positive in the event the mine were to discharge surplus water to the surface. Assuming the water quality was suitable for wildlife, a valuable enhancement fixture could be sustained at a minimum through the life of the mine. While it is possible subsurface disruption of ground water could occur as a result of subsidence it is problematically slight. (See Appendix 7-3 Probable Hydrologic Consequences (PHC).)

The losses of wildlife habitat and or vegetation through subsidence is not anticipated. The mined portion of the permit area will be monitored visually each spring for evidence of subsidence. In the event vegetation and or wildlife habitat where impacted; mitigation could take the form of: 1) habitat enhancement - through selected manipulation of existing undisturbed areas to increase productivity of preferred forage species, and 2) off site water sources such as construction of guzzlers and stock water impoundments.

Each of the above would need to be analyzed on a site specific bases, taking all agencies (UDWR, UDOGM, and BLM) input into a viable, workable, course of action to be implemented by the mine and as stipulated in the Lila Canyon EA.

Table 3-3
Time Table of Reclamation

April 16, 2020	Begin Demolition
November 15, 2020	Complete Demolition
April 16, 2021	Commence Earthwork
August 30, 2021	Completion of Phase 1 (Earthwork) Lower Area
September 1, 2021	Begin Earthwork Road / Portal Upper Area
October 1, 2021	Seeding and Mulching (Weather dependent) Completion of Earthwork Upper Area
November 1, 2021	Fencing
November 15, 2021	Reclamation Completed
July 2025	Ocular Estimates of Success (Remedial seeding if necessary September 2026)
October 2023	Planting Seedlings (If Needed)
July 2027	Quantitative Vegetation Inventory
August 2029	Quantitative Vegetation Inventory Site and Reference Area
August 2034	Quantitative Vegetation Inventory of Referenced Area and Project Site, Bond Release Criteria

The tentative life of a mine is twenty years depending on market and mining conditions. As such, the time table is generic and no set year will be specified for the cessation and abandonment of operations.

- 333.** Major Impact: The major impact to the wildlife in and around Lila Mine site will be loss of habitat. The loss of habitat will occur during the construction of the site, and will be residual throughout the life of the mine. The operational activities at the site will impact the wildlife slightly. But as observed at operations located in both the Book Cliffs and Wasatch plateau, most of the wildlife in the area will either accept or adjust their behavior to coexist with the operation.

The examples below are just some of the observations that the operator has experienced that demonstrates most wildlife accepts or adjusts to coexist with mining operations:

At U.S. Fuel Company, deer were observed crawling under railcars. Deer were observed fawning just inside old portals for three consecutive years.

At Genwal, deer have been observed on a consistent basis crossing a perennial stream to drink from the sediment pond. Bear and elk have been observed on numerous occasions from the bathhouse, office, and parking lot grazing only a few hundred feet away.

At Beaver Creek, deer have been observed drinking from the sediment pond on an almost daily basis. Bear, lion and elk were observed from the bathhouse offices. Deer were observed crawling under low conveyors instead of using a 10' elk crossing only 20' away.

At Kaiser, Rocky Mountain Bighorn Sheep were observed from the mine office on a regular basis.

At Horse Canyon Bighorn Sheep have been observed in and around the #1 and #2 sediment ponds. The Bighorns have been photographed grazing directly across the road from the inactive mine facilities.

Dust abatement and dust control as outlined in Chapter 5, such as covered conveyors, water sprays, and the minimization of large stockpiles will adequately protect adjacent undisturbed area within and surrounding the surface facilities.

It was determined that all nests within a ½ mile radius of the surface facilities have a high probability of being abandoned by indirect

disturbance associated with mine activities. The Lila Canyon EA # UT-070-99-22, outlines mitigation recommended through a cooperative effort between Utah Department of Wildlife Resources, Bureau of Land Management, U.S. Fish and Wildlife and UtahAmerican Energy, Inc. where mitigation would be implemented to increase prey base off-site. The construction of alternative nests was considered to be ineffective. Eagle distribution was not limited by suitable nest sites but by available prey.

An MSO two-year calling survey will be completed according to Appendix 3-4. Results as described in Appendix 3-4 will be reported to the Division, UDWR, and USFWS. This two-year survey will include four night time surveys with no more than one survey prior to end of April and at least three surveys prior to end of July. Results will be submitted to USFWS, DWR, and the Division immediately following of each night time survey. If owls are observed, the agencies will immediately coordinate to determine appropriate measures.

Construction at the mine to upgrade drainage controls and to construct the road will have a minor impact on wildlife in the area. The impact will mainly be increased human activity associated with the construction and a small, less than 42.6 acre, loss of habitat for the mine site, roads and sedimentation pond. These impacts will have little or no affect on the wildlife because they will be completed in an environmentally sound manner.

UEI will instruct all personnel as to current regulations regarding the use of off-road vehicles, firearm regulations, and where current UDWR proclamations are available. This training will be part of the annual refresher offered to all employees. The company will encourage strict compliance with these regulations.

DWR will be notified of any road kills involving large game and request to have them removed to safeguard raptors. Mine personnel will be instructed to remove road kills a safe distance from the road way.

The Lila Canyon Mine has agreed to mitigate the loss of wildlife habitat as well as the potential loss of habitat use due to disturbance.

This mitigation is under advisement of the wildlife professionals of both the BLM and the Utah Division of Wildlife Resources. The mitigation designed will offset impacts to bighorn sheep, mule deer, elk, and chukker specifically. The mitigation committed to in association with the Lila Mine EA is :

- (1) Install two guzzlers
- (2) Participate in a BLM habitat enhancement program on 76.14 acres-conversion from Pinyon/Juniper to shrubs, forbs, and grasses.

NOTE: The 76.14 acres is less than the EA 2000 EA acres of 93.11. This difference is a result of the EA evaluating more acreage than what will actually be disturbed. The 2000 EA considered what it calls the Lila Canyon Road which will not be constructed, thus not disturbed. The Lila Canyon Road, not being constructed, refereed to in the EA, contains 16.97 acres. The actual acres for habitat enhancement will be $93.11 - 13.23 - 3.74 = 76.14$ acres of enhancement.

The overseeing agency for the EA mitigation/enhancement will be the BLM. The implementation dates, and project locations will not be determined until the BLM notice to proceed is given, after permit approval. The Permittee will submit the BLM mitigation plan as an Appendix to this volume within one year of the initial mine construction. The BLM plan will include: project goal, expected benefits, project procedures, company commitment, implementation dates, project location and agencies contacts.

333.100. This section is addressed in 333. And 333.300.

333.200. This section is addressed in 333. And 333.300.

333.300 The goal of the mine is to construct all facilities and conduct mining in such a manner to minimize adverse impacts to wildlife. These measures will include but are not limited to:

1. Interim revegetation with desirable plant species for wildlife, with the exception of transportation corridors.
2. Speed limits on all roads to lesson potential for possible animal/vehicular collisions.
3. Wildlife awareness training to be incorporated into the annual safety training for all employees.
4. Possible restrictions on firearms on the mine site, and restrictions on off road vehicle usage to lesson disturbance.

5. The Operator will ensure that DWR surveys for cliff nesting raptors within proposed facilities areas at least two years prior and one year following construction. The Operator will conduct annual raptor surveys.

As part of normal mining operation requirements, the Permittee must submit all results of the raptor surveys to the Division in Annual Reports and must immediately contact the Division, BLM, and USFWS following any raptor survey that shows that eagles are tending nests or nesting. The agencies will immediately coordinate to determine if the Permittee must implement appropriate measures. If the agencies recommend mitigation, the Permittee must submit all plans to the Division for incorporation into Appendix 3 of the MRP.

6. An active golden eagle nest, with young, was documented during the 1999 spring raptor survey. The nest is located in the left fork of Lila Canyon within the 1-mile buffer zone. (See Plate 3-1). A consultation with USF&W, BLM, and UDWR was held in the fall of 1999. Line of site and potential mitigation was addressed during this meeting. The results of this consultation are addressed in Sec 322.220 and the Lila Canyon EA. This nest was not active in 2000, 2001, 2002, or 2003. A survey was not done in 2004. In 2005 nest 946 contained a possibly dead chick. (See Appendix 3-5 for updated inventories)

7. The Operator will adhere to exclusionary periods when initiating construction and final reclamation projects. The exclusionary periods include: raptors (Feb 1 - July 15), Bighorn Sheep rut (Nov. 15 - Dec. 15), Bighorn sheep lambing (May 1 - June 15), and Pronghorn (May15 - June 20).

In the event of unforeseen changes in construction or mine plans, or in the case of emergency situations that may force the Permittee to conduct activity near or within the 0.5 mile buffer zone of raptor nest and during

raptor exclusionary periods (February 1 to July 15 for golden eagles), the Permittee will immediately contact the Division, BLM, DWR, and USFWS. The agencies will immediately coordinate to determine appropriate measures that may include conducting ground surveys, in coordination with DWR, to determine if birds are tending nests or nesting and possibly determine the life stage of the offspring; developing a mitigation plan, in coordination with the agencies, for possible impacts to nests or birds; or ceasing operations until the end of breeding season to avoid 'take'. If the agencies recommend surveys, the Permittee must submit all survey results to the Division in Annual Reports. If the agencies recommend mitigation, the Permittee must submit all mitigation plans to the Division for incorporation into Appendix 3 of the MRP. Similar measures will be taken during Bighorn Sheep lambing exclusionary periods.

The Applicant does not plan to monitor any wildlife species during the life of the operation with the exception of raptors. Spring raptor surveys will be conducted at a minimum of a 1-mile radius around any new or potentially disruptive mining activity, 2-years prior and annually after the proposed activity. The Operator will contact the USFWS and the Division immediately following raptor surveys if raptors are observed tending nests or nesting.

The mine will emphasize their commitment to legal requirements of firearm and off-road vehicle-use by employees. This type of program has been adopted by the operator and will continue throughout the operation. An education program aimed at minimizing potential negative impacts by employees will be presented during the Operators annual retaining programs. Employees will be informed about the wildlife in the area and about which species are protected. They will be counseled to refrain from poaching or harassing animals and about the need to preserve the wildlife. They will also be instructed on the danger of animals on the road during dusk and night hours and consequently the need to reduce speed to avoid colliding with animals difficult to

see in these periods of poor light. All threatened or endangered wildlife sighted within or adjacent to the permit area will be reported to the appropriate state and / or federal agency.

The location and construction of the haulage road, as well as measures for the protection of surface hydrology, from sedimentation, including the sedimentation pond and other drainage control structures, are discussed in Chapter 7, Hydrology.

Any waters discharged from the facility will be monitored in accordance with UPDES Permit No.UTG040024. Major disturbances will be scheduled to avoid deer / antelope fawning times.

No use of pesticides or chemicals that have serious consequences to plants or wildlife will be used on the permit area, unless recommended by a regulatory agency and under their direction.

Prevention of fires and their spreading outside the permit area will be accomplished through; water sprays, and fire extinguishers located at all facilities . Wild fires will be addressed by the appropriate state and federal agencies. Operation and reclamation activities will be done in compliance with the Endangered Species Act of 1973. As instructed by the Bureau of land Management and the Utah Division of Wildlife Resources, fencing will be removed when DOGM determines that all reclamation standards have been met. Further measures taken to enhance wildlife habitat during reclamation are discussed under the "Reclamation Plans" section of this chapter.

The interim reseeding of small areas will provide some small amounts of additional forage and seed. Reseeding will particularly benefit rodents and passerine birds seeking seeds in this sparse vegetative type. The seeding of sediment pond slopes usually provides a bonus crop of seeds as the plants are watered by intermittent runoff.

Within the disturbed area, there are areas of undisturbed ground such as in topsoil storage areas.

These areas will be posted so as to preclude trespass by vehicles and/or mine equipment. In addition, dust control will be practiced throughout the life of the mine to minimize impacts from blowing dust .

The sediment pond on the disturbed area will hold water during short periods and will provide some additional surface water for wildlife. The stored water may prolong use of that portion of the winter range by deer because water is often the limiting factor on dry winter ranges. Migrating small birds and mourning doves will also utilize this water to recuperate during their flights, as well as a small indigenous flock of chukkers. In the event the water in the pond were to contain any material which would be hazardous to wildlife (ex: oil, grease), the material would be removed by the use of petroleum selected filtration material. The filtration material will be used when an apparent sheen is visible on the pond. If hazardous materials are observed the Division will be notified immediately to develop a protection plan for wildlife. The pond will be monitored visually daily by surface personnel for signs of oil and grease.

340. Reclamation Plan.

A reclamation plan for final revegetation is presented below.

341.100. TABLE 3-3 is a timetable of reclamation activities upon cessation of operation. The tentative life of a mine is twenty years depending on market and mining conditions. As such, the time table is generic and no set year will be specified for the cessation and abandonment of operations.

341.200. This section is addressed in 341.210.

341.210. TABLE 3-4 indicates the species and amounts per acre of seeds to be used in revegetation.

The seed mixture used to revegetate the disturbed areas at Lila Canyon Mine is given on TABLE 3-4, along with the rates of application. The seed mixture was developed for the disturbed area with respect to a number of considerations. Climatic conditions of area and

the availability of water were reviewed to assess the need for drought-tolerant species. The vegetation information was evaluated to determine the seed mixture needs corresponding to productivity, cover and diversity requirements. Data was gleaned from the soils report to select species adapted to the physical and chemical characteristics of the potential seedbed.

341.220. The disturbed area will be reclaimed after all operations have ceased at the mine site and all pertinent structures have been removed. The coal will be loaded out and the surface will be left relatively free of debris. The area will be recontoured to approximate pre-mine configurations. The soil will then be ripped to a depth of 16 -18 inches.

The previously salvaged top soil will then be redistributed over the total disturbed area. Soil depth and soil cover are addressed in Chapter 2.

The seedbed will be prepared by completing the final grading and again either gouged or ripped to a depth of 6-18 inches or to bedrock. Ripping the soil will be completed at a speed that maximizes the action of the ripper shanks and promotes spoil material disruption to the required depth.

During the final ripping or gouging process, seedbed material will be collected and sent to a laboratory for analysis to determine fertilizer requirements. The fertilizer recommendations will be added to the soil at the specified rate of application. Seed and fertilizer will be distributed utilizing a hydroseeder. Fertilizer and seed will not be mixed during hydroseeding operations.

Hydroseeding operations will not be conducted when wind velocities would interfere with the even distribution of the material. All efforts will be made to attain an even distribution of seed. (See Appendix 5.8)

Once Hydroseeding is complete, the area will be hydromulched, see Appendix 5-8 and Section 341.230.

The area will be seeded and fertilized (if needed) with the recommended species (see TABLE 3-4), and nutrients at the specified rate of application. At present a general recommendation indicates that 100 pounds per acre of 16-16-8 will need to be added as a nutrient.

All efforts will be made to insure the quality of materials purchased for reclamation activities are maintained throughout all work. Commercially purchased seed will have the seed names, lot number, percentages of purity, germination, hard seed and percentage of maximum weed seed count clearly marked on each container. No seed will be accepted if they contain seeds of a state-recognized noxious weed species. Sources for "common" seed should be those with climatic and elevational characteristics as close to site characteristics as possible. Legume seed will be inoculated with the correct Rhizobium.

341.230. The site will be hydro-seeded with seed and an initial 500#/acre of mulch and 100#/acre of tac agent. Followed shortly by an additional 1500 to 2000#/acre of mulch. Finally, an additional 100#acre of tac and fertilizer, choice and application rate to be determined by the testing in section 243, will be applied. Fertilizer and seeds will not be mixed together during the hydro-mulching operations.

341.240. There will be no irrigation or supplementary water used during or after the revegetation of the area. There are no planned pest or disease control measures for the mine site reclamation. Pest or disease control measures may be included in this plan if results from the test plot and / or reference area indicate a need. The measures will be consistent with proper

rangeland and wildlife management.

- 341.250.** A reference area for the mine site disturbance was established adjacent to the proposed facilities during the summer of 2003 (Figure 1, Appendix 3-1). The reference area was chosen in an area which represents the natural premining conditions of the permit area. This reference area will facilitate the determination of successful revegetation and the resultant final bond release for the Applicant.

Comparisons of the revegetated area and the reference area will be made using the data obtained from the ninth and tenth year sampling. This data will be used to obtain statistical information that will show the site meets the requirements for bond release.

- 341.300.** The methods outlined have a proven performance based on the successful reclamation of the Horse Canyon Mine in the immediate drainage to the north (less than two miles) in like habitat and aspect.

The Operator will conduct a study to determine the optimum time for seeding warm seasons species (refer to page 29).

<p align="center">Table 3.4/3.5 INTERIM AND FINAL RECLAMATION SEED MIX Recommended Seed Mix for Lila Canyon Mine</p>						
Species	Latin Name	Seeds/lb	# Seeds per Acre Planted	%Mix Planted	Seeding Rate Lbs / acre	Seeds / ft ²
<u>Grasses</u>						
Needle And Thread	Stipa Comata	115,000	230,432	5	2.00	5.3
Indian Ricegrass	Achnatherum humenoides	141,000	282,269	6	2.00	6.5
Basin Wild Rye	Leymus cinereus	130,000	129,373	3	1.00	3.0
Galleta	Hilaria jamesii	314,500	313,632	6	1.00	7.2
Bluebunch Wheatgrass	Pseudoroegneria spicata	140,000	139,392	3	1.00	3.2
Slender Wheatgrass	Elymus trachycaulus	159,000	317,988	6	2.00	7.3
Blue Gamma	Bouteloua gracilis	825,000	827,640	17	1.00	19.0
Subtotal						51.4
<u>Forbs</u>						
Blue Flax	Linum lewisii	293,000	294,030	6	1.00	6.8
Palmer Penstemon	Penstemon palmeri	610,000	152,460	3	0.25	3.5
Globemallow	Sphaeralcea ambigua	500,000	250,470	5	0.50	5.8
Indian Paintbrush	Castilleja linariaefolia	4,915,000	479,160	10	0.10	11.0
Fringed Sage	Artemisia frigida	4,536,000	435,600	9	0.10	10.0
Subtotal						37.0
<u>Shrubs</u>						
Wyoming Big Sage	Artemisia tridentata	2,576,000	653,400	13	0.25	15.0
Green Rabbitbrush	Chrysothamnus nauseosus	400,000	41,382	1	0.10	1.0
Fourwing Saltbush	Atriplex canescens	52,000	43,560	1	0.84	1.0
Winterfat	Ceratoides lanata	56,700	56,628	1	1.00	1.3
Shadscale	Antriplex confertifolia	64,900	64,904	1	1.00	1.5
Cliffrose	Cowania mexicana	64,600	64,469	1	1.00	1.5
Black Sage	Artemisia nova	907,200	230,868	5	0.25	5.3
Subtotal						26.5
TOTAL PER ACRE		16,799,900	5,007,658	100	16.39	115

342. Fish and Wildlife. A fish and wildlife plan follows:

342.100. The sediment pond will be maintained through the life of the operation and will be removed when effluent criteria is met following reclamation.

342.200. Rangeland for domestic stock is the secondary intended postmining land use with wildlife habitat as the primary land use. Plant species appropriate for enhancing the wildlife habitat were selected on the basis of known wildlife requirements including nutritional value for fish and wildlife, use as cover for fish and wildlife and ability to support and enhance fish and wildlife habitat. The Pinyon/Juniper area will be enhanced and reclaimed to the Grass/Shrub community type. The habitat type provides excellent winter range for big game, as well as, an increase in rodent populations which in turn are beneficial to raptors. The Lila Canyon EA has stipulated that in excess of 70 acres of wildlife habitat will be enhanced to help offset negative impacts.

342.210. This section is addressed in 342.200.

342.220. This section is addressed in 342.200.

342.230. This section is addressed in 342.200.

342.300. This section is not applicable.

342.400. This section is not applicable.

350. Performance Standards

351. All coal mining and reclamation operations will be carried out according to plans provided under R645-301-330 through R645-301-340.

352. Lila Canyon Mine will implement contemporaneous reclamation on all areas that are disturbed through construction or in the course of mining that will not be utilized for future activity that constitutes continued disturbance.

353. General Requirements. The Permittee will establish on regraded areas and on all other disturbed areas a vegetative cover that is in accordance with the approved permit and reclamation plan. The first available season following abandonment / completion the area will be seeded and mulch in accordance with the approved reclamation plan.

353.100 The contemporaneous seed mix TABLE 3-5 is capable of self-regeneration.

The seed mix in Table 3-5 is designed to be compatible with native plant species and beneficial to the animals indigenous to the area for both forage and cover.

All seed used in contemporaneous revegetation will be certified and in compliance with all state and federal laws governing seeding.

353.130. The vegetative cover will be at least equal in extent of cover to the natural vegetation of the area; and

353.140. Capable of stabilizing the soil surface from erosion.

353.200. The reestablished plant species will:

353.210. Be compatible with the approved postmining land use:

353.220. Have the same seasonal characteristics of growth as the original vegetation:

353.230. Be capable of self-regeneration and plant succession:

353.240. Be compatible with the plant and animal species of the area; and:

- 353.250.** Meet the requirements of applicable Utah and federal seed, poisonous and noxious plant; and introduced species laws or regulations.
- 353.300.** The Division may grant exception to the requirements of 353.220 and 353.230 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.
- 353.400.** There are no prime farm lands within the permit area or anticipated crop lands.
- 354.** Timing: Seeding will occur between September 30 and may proceed up until March 30 depending on snow and frost condition
- DOG M has expressed a concern over the fall planting of the warm season species, Blue grama and Galleta. Both of these species are in evidence at the Horse Canyon Site, which was reclaimed in the fall of 1991. However, UEI is committed to use these species in the interim seed mix, adjacent to the sediment pond. Area 1, the Southeast corner, and Area 4 the Northwest corner of the pond disturbance, will be seeded mid summer (July) following the construction. Area 2, the Southwest quarter and Area 3 the Northeast quarter of the disturbance, will be seeded late fall (October) following construction. The line separating the four areas will be staked on the ground. Ocular estimates of the success of the reclamation will be implemented each fall for 3 years following the reclamation. In year 4, if there appears to be an apparent difference in success, a quantitative sample will be taken. The sample will identify both species composition as well as overall vegetative cover for both areas.
- If in the event a conclusion as to the timing of planting results in a significant degree of success, the reclamation plan can be modified during the 5 year renewal process.
- 355.** Mulch will be applied on the same bases as indicated for permanent reclamation.
- 356.** Standards for Success:

- 356.100** Success of revegetation will be judged on the effectiveness of the vegetation for the approved postmining land use, the extent of cover compared to the extent of cover of the reference area.
- 356.110.** Standards for success, statistically valid sampling techniques for measuring success, and approved methods are identified in the Division's "Vegetation Information Guidelines, will be followed closely. (See "Lila Canyon Vegetation Inventory" found in Appendix 3-1)
- 356.120.** Standards for success recommended in the "Vegetation Information Guidelines" will be followed closely. (See "Lila Canyon Vegetation Inventory" found in Appendix 3-1)
- 356.200.** Standards for success will be applied in accordance with the approved postmining land use of wildlife and incidental use by domestic stock.
- 356.210.** This Section does not apply since the area is post mining wildlife habitat, with incidental use by domestic stock.
- 356.220.** This Section does not apply since there are no agriculture lands within the permit area and no prime farm lands. See Chapter 2, Appendix 2-1 (Prime Farmland Letter).
- 356.230.** Success of vegetation will be determined on the basis of tree and shrub stocking and vegetative ground cover. Such parameters are described as follows:
- The requirements for cover, productivity and woody plant density are, at least 90% of the cover, woody plant density and productivity of the reference area with 90% statistical adequacy. The site will be sampled in a manner similar to the method used to sample the reference

area.

Diversity will be determined with the following method:

- 1) All species encountered with at least a 20% frequency in the vegetation sampling will be categorized into life forms. The life form categories that will be used are native grass, native broadleaf forbs, native shrub, desirable introduced, and undesirable. Undesirable species are those generally classified as weeds or that are poisonous to livestock. If there is any question whether a species should be considered undesirable, the Division and UtahAmerican will consult with the Emery County Weed Department.
- 2) The standard will be that the reclaimed area must have at least as many native grass, native broadleaf forbs, and native shrub species occurring at 20% or greater frequency as the reference area. For example, if the reference area has 3 native shrub species occurring at 20% or greater frequency, the reclaimed area must also have this many species. The species do not need to be the same.

Essentially the same method would be used to judge seasonality, but the only categories would be warm and cool season.

Erosion control relative to both vegetation density and species composition would be based on effluent standards as committed in the UDPES permit. All drainages leading away from the permit area will be sampled as often as practical. When effluent standards are met, the vegetation will have demonstrated its erosion control effectiveness. Woody plant density for the entire area will be established with 1,500 plants per acre, unless the Divisions consultation with area agencies determines a different

density.

- 356.231.** (See Section 256.230)
- 356.232.** Tree stocking / woody plant density will meet or exceed UDOGM guidelines for bond release.
- 356.233.** Success standards for vegetative ground cover: (See Section 256.230)
- 356.240.** This Section does not apply since no portion of the permit area will be used for industrial, commercial or residential use.
- 356.250.** No pre-law mining occurred on the Lila Canyon Permit area.
- 356.300.** Lila Canyon Mine is committed to maintain siltation structures until vegetative cover is adequate to allow runoff to meet affluent limits as directed by UDOGM at a minimum two years following vegetation establishment.
- 356.400.** Lila Canyon Mine will have all disturbance associated with removal of siltation structures seeded and mulch in accordance with the approved revegetation plan.

357. Revegetation: Extended Responsibility Period.

- 357.100.** The period of extended responsibility for successful vegetation will begin after the last year of seeding, fertilization, irrigation, or other work, excluding approved husbandry practices.
- 357.200.** Vegetation parameters will equal or exceed the approved success standard during the growing seasons

for the last two years of the responsibility period. The period of extended responsibility will continue for five or ten years based on precipitation data.

357.210. Since Lila Canyon has an average annual precipitation of less than 26.0 inches this section is not applicable.

357.220. The mine plan area averages nine inches at the lowest elevation (area of greatest disturbance) to fourteen to sixteen inches at the highest elevation. Lila Canyon Mine will assume the ten year bond liability period.

357.300. Husbandry Practices - General Information

357.301. Lila Canyon Mine would like to reserve the right to apply for augmentation of reclaimed area extending the bond liability period on a site specific case scenario.

357.302. Husbandry practices proposed for the reclaimed areas are not necessitated by inadequate grading practices, adverse soil conditions, or poor reclamation procedures.

357.303. The Division will consider the entire area that is bonded within the same increment, as defined in R645-301-820.110, when calculating the extent of area that may be treated by husbandry practices.

357.304. If it is necessary to seed or plant in excess of the limits set forth under R645-301-357.300, the Division may allow a separate extended responsibility period for these reseeded or replanted areas in accordance with R645-301-820.330.

357.310. Reestablishing trees and shrubs

357.311. Trees or shrubs may be replanted or reseeded at a rate of up to a cumulative

total of 20% of the required stocking rate through 40% of the extended responsibility period.

357.312. Lila Canyon Mine has incorporated wood plant / tree seeding into the seed mix (see TABLE 3-4). If after two years following seeding and mulching it is apparent that woody plant density / tree cover appear to be insufficient for bond release; the mine may elect to re-enter selected areas and augment the direct seeding with either / or containerized or bare root seedlings, this determination will need to be made on a site specific bases. The goal for bond release is the establishment of 1500 woody plants per acre.

357.320. Based on similar reclamation projects in adjacent areas, the need to control weeds other than by selected removal is unlikely. In the unlikely event that weed control is required by chemical means, R645-357357.321 will be followed. In the unlikely event that weed control is required by Biological means, R645-357.323 will be followed. In the unlikely event that weed control is required by mechanical means, R645-357.322 will be followed.

357.321. In the unlikely event that weed control is required by Chemical means, R645-357.321 will be followed by mine personnel.

357.322. In the unlikely event that weed control is required by Mechanical means, R645-357.322 will be followed by mine personnel.

357.323. In the unlikely event that weed control is required by Biological means, R645-357.323 will be followed by mine personnel.

- 357.324.** In the unlikely event that weed control practices damage desirable vegetation, R645-357.324 will be followed by mine personnel.
- 357.330.** Wildlife habitat is the priority post mining land use. As such, control of wildlife is not anticipated.
- 357.331.** Wildlife habitat is the priority post mining land use. As such, control of wildlife is not anticipated.
- 357.332.** Mine personnel do not anticipate a need to implement control measures for small mammals or insects. However, in the unlikely event that control is necessary, R645-357.332 will be followed. The Division must approved animal control methods sited in R645-357.332.
- 357.340.** Natural Disasters and Illegal Activities Occurring After Phase II Bond Release. Where necessitated by a natural disaster, excluding climatic variation, or illegal activities, such as vandalism, not caused by any lack of planning, design, or implementation of the mining and reclamation plan on the part of the Permittee, the seeding and planting of the entire area which is significantly affected by the disaster or illegal activities will be allowed as an accepted husbandry practice and thus will not restart the extended responsibility period. Appendix C of the Division's "Vegetation Information Guidelines" references publications that show methods used to revegetate damaged land. Examples of natural disasters that may necessitate reseeding which will not restart the extended responsibility period include wildfires,

earthquakes, and mass movements originating outside the disturbed area.

357.341. The extent of the area where seeding and planting will be allowed will be determined by the Division in cooperation with the Permittee.

357.342. All applicable revegetation success standards will be achieved on areas reseeded following a disaster, including R645-301-356.232 for areas with a designated postmining land use of forestry or wildlife.

357.343. Seeding and planting after natural disasters or illegal activities will only be allowed in areas where Phase II bond release has been granted.

357.350. No Irrigation is anticipated.

357.360. Rills and gullies in excess of eight inches width and / or depth will be repaired on a seasonal bases. Repairs will be made in such manner that minimizes additional disturbance and yet is cost effective based on site specific conditions.

357.361. After the first 20% of the extended responsibility period but prior to the end of the first 60% of the responsibility period or until Phase II bond release, whichever comes first, highly erodible area and rill and gully repair will be considered augmentative, and will thus restart the responsibility period, if the area to be repaired is greater than 3% of the total disturbed area or if a

continuous area is larger than one acre.

357.362. The extent of the affected area will be determined by the Division in cooperation with the Permittee.

357.363. The area affected by the repair of highly erodible areas and rills and gullies is defined as any area that is reseeded as a result of the repair. Also included in the affected areas are interspacial areas of thirty feet or less between repaired rills and gullies. Highly erodible areas are those areas which cannot usually be stabilized by ordinary conservation treatments and if left untreated can cause severe erosion or sediment *damage*.

357.364. 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.

357.365. The areas of concern on the initial reclamation are those natural drainage channels which will be reconstructed during the earth moving phase of reclamation. Specific design and specifications are included in Chapter 7 (Drainage Design). All regraded areas in excess of three percent slope will be sacrificed to aid in the retention of moisture and minimize erosion. Areas in excess of 3:1 slopes will receive additional mulch

and tac to facilitate vegetation establishment.

358. Protection of Fish, Wildlife Values: Mine personnel will be trained annually on environmental awareness, a portion of the training will deal with wildlife concerns, such as avoidance during stress periods, caution in driving to and from work during peak usage periods, recognition of any threatened and endangered species etc. Speed limits will be posted to minimize vehicular / wildlife accidents. In addition, all suitable water encountered during mining will be discharged in such a manner to make it available to wildlife.

358.100. Appendix 3-3 is a letter from U.S. Fish and Wildlife Service identifying all threatened and endangered species that could occur in the permit area or within a one-half mile proximity. All mine personnel will be trained about these species and notify the environmental coordinator at the mine. The environmental coordinator will confirm, if possible, the identification, notify USFWS and the Division, and then take what ever actions are necessary to safeguard both the species and it's habitat.

In addition, a threatened and endangered species inventory will be conducted prior to any disturbance. Historical as well as current threatened and endangered inventories are included in Appendix 3-4.

Prior to any new surface disturbance a raptor inventory will be conducted to ensure that no raptors or their nests or young would be adversely impacted through any mining or mine related activity. A copy of historical raptor data as well as current survey results are attached as Appendix 3-5.

A one-half mile buffer zone of no new disturbance during critical nesting periods will be maintained during that portion of the year that the nest sites are active.

As part of normal mining operation requirements, the Permittee must submit all results of the raptor surveys

to the Division in Annual Reports and must immediately contact the Division, BLM, and USFWS following any raptor survey that shows that eagles are tending nests or nesting. The agencies will immediately coordinate to determine if the Permittee must implement appropriate measures. If the agencies recommend mitigation, the Permittee must submit all plans to the Division for incorporation into Appendix 3 of the MRP.

In the event of unforeseen changes in construction or mine plans, or in the case of emergency situations that may force the Permittee to conduct activity near or within the 0.5 mile buffer zone of raptor nest and during raptor exclusionary periods (February 1 to July 15 for golden eagles), the Permittee will immediately contact the Division, BLM, DWR, and USFWS. The agencies will immediately coordinate to determine appropriate measures that may include conducting ground surveys, in coordination with DWR, to determine if birds are tending nests or nesting and possibly determine the life stage of the offspring; developing a mitigation plan, in coordination with the agencies, for possible impacts to nests or birds; or ceasing operations until the end of breeding season to avoid 'take'. If the agencies recommend surveys, the Permittee must submit all survey results to the Division in Annual Reports. If the agencies recommend mitigation, the Permittee must submit all mitigation plans to the Division for incorporation

- 358.200.** No coal mining and reclamation operations will be conducted in a manner which would result in the unlawful taking of a bald or golden eagle, its nests, or any of the eggs.
- 358.300.** This section is addressed in 358.200.
- 358.400.** There are no wetlands and / or riparian areas within the area of potential disturbance.
- 358.500.** Each operator will, to the extent possible using the best technology currently available:
- 358.510.** All power and transmission lines will be

designed with the best technology available to safeguard raptors.

358.520. All structures; fences, conveyors etc., will be designed to allow free movement of large mammals except in those areas where it is necessary to preclude large animals for their own safety; example: power substations, oil storage area etc.

358.530. All structures; fences, conveyors etc., will be designed to allow free movement of large mammals except in those areas where it is necessary to preclude large animals for their own safety; example: power substations, oil storage area etc.

WordPerfect Document Compare Summary

Original document: K:\Lila\2016\L16-001 Ventilation Breakout and Removal of Part A and B References\Deficiencies Task 5081\Originals\Chapter 5.wpd

Revised document: K:\Lila\2016\L16-001 Ventilation Breakout and Removal of Part A and B References\Deficiencies Task 5081\Chapter 5 Edits.wpd

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**Horse Canyon Extension
Lila Canyon Mine**

**Chapter 5
Engineering**

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Chapter 5

500. ENGINEERING

510. Introduction

This section presents the engineering portion for the Lila Canyon Extension to the Horse Canyon Mine Reclamation Plan and is based upon previous publications, permit applications for the adjacent Sunnyside and South Lease areas and design which follows basic engineering standards. The objective of this chapter is to provide sufficient engineering design to support the mining and reclamation plan for the Lila Canyon Mine which is part "B" of the Horse Canyon Permit (ACT/007/013) and to satisfy the rules found in R645-301-500. All of the activities associated with the coal mining and reclamation operations are designed, located, constructed, maintained, and reclaimed in accordance with the operation and reclamation plan. The engineering section of the permit application is divided into the introduction, the operation plan, operational design criteria, reclamation plan, and performance standards. All design criteria associated with the operation and reclamation plan have been met.

511. General Requirements.

511.100 The permit application includes a description of the proposed coal mining and reclamation operations with appropriate maps, plans, and cross sections.

511.200 A description of the proposed mining operation and its potential impacts to the environment as well methods and calculations utilized to achieve compliance with design criteria is addressed within this chapter.

511.300 A description of the proposed reclamation plan is included in this chapter.

512. Certification

512.100. Cross Sections and Maps that require certification have been prepared by, or under the direction of, and certified by a qualified, registered, professional engineer, with assistance

from experts in related fields when needed. Cross Sections and Maps will be updated as needed or required by the Division. Listed below are some of the maps and cross sections that have been certified by a qualified registered professional engineer.

- 512.110.** A map showing the extent of known existing mine workings and the approximate year mined has been included and certified by a qualified registered professional engineer and included as Plate 5-1.
- 512.120.** All Surface facilities and operations are shown on the appropriate maps and have been certified by a qualified registered professional engineer.
- 512.130** Maps showing final surface configuration with cross sections have been included and certified by a qualified registered professional engineer. (See Plate 5-6, 5-7c, and Appendix 5-4)
- 512.140** Appropriated hydrology drawings and cross sections have been certified by a qualified registered professional engineer. (See Chapter 7)
- 512.150** Geologic cross sections and maps that are required to be, have been certified by a qualified registered professional engineer. See Chapter 6 and Plate 7-1B.
- 512.200** Plans and Engineering Designs which may include: Excess spoil piles, durable rock fills, coal mine waste, impoundments, primary roads and variances from approximate original contour. These Plans and Designs have been certified by a qualified registered professional engineer if appropriate.
- 512.210** Lila Canyon Mine is an underground operation, therefore it is anticipated that no excess Spoil will be produced. This section does not apply.
- 512.220** The professional engineer experienced in the design of earth and rock fills has certified that the durable rock fill

design will ensure the stability of the fill and that the fill meets design requirements.

- 512.230** The professional engineer experienced in the design of coal mine waste piles has certified the design of the coal mine waste disposal facility. (See Appendix 5-7)
- 512.240** Prudent engineering practices was used in the design and construction of impoundments in the permit area. The impoundment designs have been certified by a qualified registered professional engineer. (See Plate 7-6)
- 512.250** The professional engineer has certified the design and construction or reconstruction of primary roads as meeting the appropriate design criteria.
- 512.260** The operator is not requesting a variance from the approximate original contours (AOC).

513. Compliance With MSHA Regulations and MSHA Approvals.

- 513.100** Neither Coal processing waste dams or embankments are anticipated during the term of this permit. Therefore, this section is not applicable.
- 513.200** Planned impoundments and sedimentation ponds do not meet the size or other qualifying criteria of MSHA, 30 CFR 77.216(a). Therefore, this section is not applicable.
- 513.300** Underground development waste transported to the surface, coal processing waste and excess spoil will not be disposed of underground. However, material such as overcast material, rock falls, and slope material, not transported to the surface, may be disposed of underground according to the appropriate MSHA regulations.
- 513.400** Refuse piles meet the requirements of MSHA, 30 CFR 77.214 and 30 CFR 77.215 and all appropriate R645 regulations. (See Appendix 5-7)
- 513.500** Shafts, drifts, adits, tunnels, exploratory holes, entryways or other opening to the surface from the underground will be capped, sealed, backfilled or otherwise properly managed

consistent with MSHA, 30 CFR 75.1711.

- 513.600** Surface water discharges into the underground mine workings is not anticipated or planned, Therefore, this section is not applicable.
- 513.700** Surface mining within 500 feet to an active underground mine is not planned nor anticipated. Therefore, this section does not apply.
- 513.800** Coal mine waste fires plans will be submitted to MSHA and the Division for their approval prior to extinguishing any coal mine waste fires. (See Appendix 5-3)

514. Inspections

All engineering inspections, except the quarterly inspections of impoundments not subject to MSHA, will be conducted by a qualified registered professional engineer or other qualified professional specialist under the direction of the professional engineer.

- 514.100** Lila Canyon is an underground operation and it is not anticipated that any spoil will be produced. Therefore, this section does not apply.
- 514.200** Refuse Piles. A professional engineer or specialist experienced in the construction of similar earth and waste structures will inspect the refuse pile during construction.
 - 514.210** Regular inspections by the engineer or specialist will also be conducted during placement and compaction of coal mine waste materials. If it has been determined that a danger of harm exists to the public health and safety or the environment, more frequent inspections will be conducted. Inspections will continue until the refuse pile has been finally graded and revegetated or until a later time as required by the Division.
 - 514.220** The refuse pile inspections will be performed at least quarterly throughout construction and during the following construction periods:
 - 514.221** In addition to quarterly inspections, an inspection

- will be performed during foundation preparation which includes the removal of all organic material and topsoil;
- 514.222** Since no under-drain or protective filter systems are planned, this section is not applicable.
- 514.223** In addition to quarterly inspections, an inspection will be performed during the installation of the final surface drainage systems.
- 514.224** In addition to quarterly inspections, an inspection will be performed after the final grading and the facility has been revegetated.
- 514.230** The division will be provided a certified report prepared by, or under the supervision of, the qualified registered professional engineer after each inspection. The report will certify that the refuse pile has been constructed and maintained as designed and in accordance with the approved plan and R645 Rules. This report will include statements stating the appearances of instability, structural weakness, and other hazardous conditions if found. (See Appendix 5-1)
- 514.240** Since protective filters and under-drain are not required in the current design criteria this section is not applicable.
- 514.250** Required refuse pile reports will be retained at or near the mine site in an area convenient to the resident agent and the qualified registered professional engineer. Appendix 5-1 is an example of the refuse pile inspection form.
- 514.300** Impoundments
- 514.310** A professional engineer or specialist experienced in the construction of impoundments will inspect impoundments.

- 514.311** During construction inspections will be made on a regular basis and upon completion of the pond the inspections will be performed at least yearly. Inspections will continue yearly until the pond is removed or the performance bond is released.
- 514.312** After each inspection the qualified registered professional engineer will promptly provide to the Division, a certified report. This report will state that the impoundment has or has not been constructed and maintained as designed and in accordance with the approved plan and the R645 Rules. The report will include a discussion of any appearances of instability, structural weakness or other hazardous conditions. All so included in the report will be the 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.
- 514.313** Required impoundment inspection reports will be retained at or near the mine site in an area convenient to the resident agent and the qualified registered professional engineer. Appendix 5-2 is an example of the impoundment inspection form.
- 514.320** Since the pond contained in the Lila Canyon Project is less than 20 feet high and stores less than 20 acre-feet of water it is not subject to MSHA, 30 CFR 77.216. Therefore, this section does not apply.

515. Reporting and Emergency Procedures.

- 515.100** If a slide occurs, the operator will telephone DOGM to notify them of the situation and recommend remedial measures to be taken to alleviate the problem. Additional remedial measures required by DOGM will be implemented.
- 515.200** During impoundment inspections any potential hazards noted

will be reported to DOGM along with measures to be implemented to eliminate the hazard.

515.300 In the case of temporary cessation of operations the following will apply:

515.310 All provisions of the approved permit will be complied with during temporary cessation or abandonment.

515.311 In case of temporary cessation the operator will 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.

515.312 Since Lila Canyon Mine is an underground operation this section does not apply.

515.320 Prior to a temporary cessation of coal mining and reclamation operations which is expected to last longer than 30 days, or when a temporary cessation is extended longer than 30 days, the operator will submit to the Division a notice of intention to cease or abandon operations. The following will be included in the notice of temporary cessation.

515.321 The temporary cessation notice will contain the exact number of surface acres and the horizontal and vertical extent of subsurface strata included in the permit area. In addition a description of the reclamation activities accomplished and activities such as backfilling regrading, revegetation, environmental monitoring, underground opening closures and water treatment activities that will continue during the temporary cessation.

515.322 Since the Lila Canyon Mine is an underground operation this section does not apply.

516. Prevention of Slides: Since the Lila Canyon Mine is an underground

operation this section does not apply.

520. Operation Plan.

At first glance it would appear to a non-mining person that the best access to UEI's leases would be from the existing (sealed) Horse Canyon portals using the current Horse Canyon surface disturbance. However, the existing Horse Canyon site is not suitable for a large longwall operation. The old Horse Canyon Mine was not designed to produce 4.5 million tons as will be Lila. Some strategic pillars in the old mains were extracted upon retreat preventing any future access. The number of entries in the old works are not adequate for ventilation purposes. Portions of the old mine are flooded preventing reentry. The distance from the old portals to the current leases would result in unacceptable travel times for crews and supplies. Rehabilitating and maintaining an old mine is extremely hazardous and expensive. As a result of the conditions described above it has been determined that new portals at the Lila Canyon site is the most logical and only feasible access to the permittee's coal leases.

Mine Facilities List Lila Canyon Mine

A list of new structures and facilities follows:

Buildings

- 1) Office/Bathhouse
- 2) Shop Warehouse
- 3) Security Shack

Utilities

- 4) Mine Substation
- 5) Surface Power Lines
- 6) Water Treatment Plant
- 7) Potable Water Tank
- 8) Process Water tank
- 9) Sewer Tank
- 10) Drain Field

Mine Facilities

- 11) Ventilation Fan

- 12) 60-inch Conveyor from tunnels to Coal Stockpile
- 13) (ROM) Underground Belt from Stockpile to Crusher
- 14) 48-inch Conveyor from Crusher to Loadout Bin
- 15) Drop from Loadout Bin to Truck Loadout
- 16) Reclaim Tunnel, Escape Tunnel, Fan and Fan House
- 17) ROM Storage Pile, Coal Stacking Tube, 30 ton Rock Dust Silo
- 18) Crusher Screen Plant
- 19) Truck Scale and Loadout
- 20) Coal Loadout Storage Bin
- 21) Guardrails
- 22) Underground Pipes
- 23) Chain Link Fence

Support Facilities

- 24) Non-Coal Waste Area
- 25) Equipment & Supplies Storage Area
- 26) Topsoil Pile
- 27) Refuse Pile
- 28) Sediment Pond
- 29) Slope Access Road / Portal Access Road
- 30) Rock Slopes
- 31) Mine Facilities Road / Truck Loadout Road
- 32) Office/Bathhouse/Warehouse Asphalt Parking Area
- 33) Mine Parking
- 34) Fuel Tanks
- 35) Powder and Cap Magazines
- 36) Culvert locations are shown on Plate 7-2.

A description of new structures and facilities:

Office/Bathhouse

The office and bathhouse building is shown on Plate 5-2. This building will jointly house all support personnel such as accounting, administration, engineering, and safety and will provide a comfortable office environment for all employees. Bathhouse and toilet facilities will be found for all employees at this location. The bathhouse will provide a location for underground miners to change from clean street clothes to clothing suitable for underground use. The area will provide showers for employees for use after their scheduled work shifts so they can clean up prior to returning home. Both the bathhouse and office buildings will be of prefabricated construction and will rest on a concrete pad. The pad dimensions will be approximately 150' by 100'

by 12". The facility will be designed to accommodate up to 200 employees working rotating shifts.

Shop Warehouse

The shop warehouse building is shown on plate 5-2. Parts and supplies consumed during the mining process will be stored in the warehouse to be issued as needed. The shop area will be used to perform minor equipment repairs and overhauls. The shop warehouse will be a prefab modular type building approximately 100' by 150' and will rest on a 4" concrete pad.

Security Shack

The Security Shack shown of Plate 5-2, when used will provide security to the mine site. The security shack will be used primarily at times when the mine is not in production. Security may be provided to protect the public from hazards associated with a mine site and to protect company property from unauthorized use. The security shack will be approximately 10' by 20' by 8" and will be of prefab construction and will rest on a 4" concrete slab.

Mine Substation

The mine substation will be located as shown on Plate 5-2 will provide power to surface and underground areas of the mine property. The substation will comprise of approximately four transformers setting on a concrete pad approximately 20' by 20' by 12" and fully fenced. The total area of the substation is approximately 40' by 40'. Power will be fed into the transformers at 46 KVA and will be transformed down to usage voltages for both the surface and underground facilities. It is anticipated that voltages of 110, 220, 440 will be used on the surface and 12,470 volts will be utilized underground. The mine substation will be constructed in a way to fulfill all appropriate MSHA regulations.

Underground Power Lines

Within the disturbed area both surface and underground power lines will be utilized. Underground lines will be run where feasible. As builds will be provided. Underground Power Lines will be left in place upon reclamation.

Water Treatment Plant

The water treatment plant is located on the north-east side of the surface facility area. The plant will rest on a 15' by 15' slab. Process water will flow through the treatment plant at which time it will be treated and made suitable for potable water uses. The potable water will be stored in the potable water tank until it is used. The location of the water treatment plant can be found on Plate 5-2.

Potable Water Tank

Water treated by the water treatment plant and intended to be used as potable water will be stored in this 15' diameter by 20' high tank. The tank will set on a 15' by 15' concrete pad designed for adequate support of the tank. The location of the potable water tank can be found on Plate 5-2.

Process Water Tank

Process water, water to be used for mine use or to be treated for potable use, will be stored in this tank. The 15' diameter by 20' high process water tank will rest on a 15' by 15' concrete pad. Process water tank will be filled by using mine discharge water or may be hauled in from off site. The location of the process water tank can be found on Plate 5-2.

Sewer Tank

The sewer tank has been designed to facilitate 200 employees working on rotating shifts. The sewer tank will be located under the south end of the office and bathhouse parking area. The location of the sewer tank can be found on Plate 5-2. The design for the Sewer Tank can be found in Appendix 5-4.

Drain Field

The drain field has been designed to facilitate 200 employees working on rotating shifts. The drain field will be located at a lower elevation and south of the sewer tank. The location of the drain field can be found on Plate 5-2. The design for the drain field can be found in Appendix 5-4.

Ventilation Fan

The ventilation fan will be located on #0 Portal. The location of the portal and fan is shown on Plate 5-2.

60-inch Conveyor from tunnels to Coal Stockpile(Main Conveyor)

The Run of Mine underground belt will provide for a means for coal to be conveyed from the working faces to the run of mine coal storage pile on the surface. The belt will provide capacity to convey to the surface, all coal mined in the underground workings. Preliminary design suggests that the conveyor that extends from the bottom of the rock slopes to the stacking tube at the coal storage area, shown on Plates 5-2 and 5-8, will have the following specifications: 60" wide, speed approximately 700 fpm with a length of approximately 810 feet long. Since the ground beneath the conveyor will not be disturbed due to the steepness and remoteness of the area, this conveyor will be completely contained within a tube type structure.

(ROM) Underground Belt from Stockpile to Crusher/ Screen

The Reclaim conveyor will provide for a means for coal to be conveyed from the coal stockpile to the crusher. The belt will provide capacity to convey to the screen and crusher at a suitable rate for crushing and screening. Preliminary design suggests that the reclaim conveyor, shown on Plates 5-2 and 5-8, will have the following specifications: 60" wide, speed approximately 700 fpm with a length of approximately 670 feet long. The portions of the conveyor running on the surface will be covered.

60-inch Conveyor from Crusher to Loadout Bin

The Loadout conveyor will provide for a means for coal to be conveyed from the crusher to the loadout bin. The belt will provide capacity to convey to the loadout at the same rate as the Reclaim conveyor. Preliminary design suggests that the Loadout conveyor, shown on Plates 5-2 and 5-8, will have the following specifications: 60" wide, speed approximately 500 fpm with a length of approximately 230 feet long. The portions of the conveyor running on the surface will be covered.

Drop from Loadout Bin to Truck Loadout

Coal will be dropped from the loadout bin to the trucks being loaded. The drop rate will provide capacity to the trucks at a rate suitable for truck

loading.

Reclaim Tunnel, Escape Tunnel, Fans

Design for the escape and reclaim tunnels is not complete. Standard practice is to construct the tunnels from either concrete or corrugated metal. The reclaim tunnel is approximately 350' long with a 14' diameter. The escape tunnel will be approximately 300' long with a diameter of 4'. Appropriate safety and environmental concerns will be addressed upon detailed design. The preliminary layout is shown on Plates 5-2 and 5-8.

ROM Storage Pile

The run of mine storage pile receives coal directly from the underground works and provides storage for the coal until it is crushed and loaded into trucks for transportation to a unit train loadout. The coal from the underground run of mine belt will be dropped into a stacking tube located in the center of the run of mine storage pile. This tube will help reduce any fugitive dust. The stacking tube will be approximately 80' high and will allow for approximately 200,000 tons of open storage in the run of mine storage pile. A 30 ton rock dust bin will be located in this area. The run of mine storage pile is shown on Plates 5-2 and 5-8.

Crusher

The enclosed crusher will crush coal from the 8" minus down to a 2" minus size, at the rate of approximately 1000 tons per hour. The coal will be first screened then the oversized will be crushed. Crushed coal will be stored temporarily in a 500 ton storage bin located above the truck loadout. The crusher and screen locations are shown in Plates 5-2 and 5-8.

Truck Scale and Loadout

Coal will be reclaimed from the coal storage bin, weighed and then loaded into coal haul trucks for transportation to the various unit train loadouts. A small loadout shack will be constructed to provide cover and protection for the various equipment and controls need for the coal loading process. The truck scale and loadout are shown on Plates 5-2 and 5-8.

Coal Storage Bin

The coal storage bin is part of the truck loadout and is shown on Plate 5-2. The coal storage bin is where crushed coal is stored waiting to be loaded into coal haul trucks. The bin provides for surge capacity and allows for better control of crushing time. The coal storage bin provides for an enclosed dry location for temporary crushed coal storage. Coal is delivered from the crusher to the coal storage bin by use of a 60" covered surface conveyor running at a speed of approximately 700 FPM. The preliminary layout is shown on Plates 5-2 and 5-8.

Coal Stacking Tube.

The final design for the coal stacking tube is not yet complete. Preliminary design indicates that the stacking tube will be approximately 15' Diameter and approximately 80 feet high. Standard practice is to construct the tube of either concrete or steel. The preliminary layout is shown on Plates 5-2 and 5-8.

Culverts

A complete list and design for the culverts can be found in Appendix 7-4 Tables 9 and 10, and are shown on Plate 7-2. A summary of the culverts follows:

<u>Culvert</u>	<u>Length</u>	<u>Size</u>
DC-1	30'	18"
DC-2	65'	18"
DC-3	33'	18"
DC-4	135'	18"
DC-5	50'	18"
DC-6	80'	24"
DC-7	110'	18"
DC-8	85'	24"
DC-9	35'	18"
DC-10	55'	18"
DC-11	65'	18"
DC-12	50'	18"
DC-13	30'	24"
DC-14	60'	18"
DC-15	60'	18"
DC-16	60'	18"

DC-17	75'	18"
DC-18	35'	18"
DC-19	40'	18"
UC-1	480'	60"

Guard Rails

Approximately 1,520 feet of Guard rails will be installed on the mine access road according to the detailed engineering plan being prepared. Appropriate MSHA and UDOT requirements will be taken into consideration.

Underground Pipes

Locations of the underground pipes have yet to be determined. Once detailed engineering design is completed the underground pipes will be added to Plate 5-2 or other appropriate Plates. Under ground pipes will be left in place upon reclamation.

Chain Link Fence

Approximately 1,500' of a six foot high chain link fence will be constructed as shown on Plate 5-2. The fence will be constructed to protect the public, and provide security along the section of county road that runs adjacent to the property.

Non-Coal Waste Area

An area for non-coal waste has been identified on Plate 5-2. Non-coal waste such as papers, timbers, cans, and miscellaneous scrap that is brought to the surface will be disposed of in a metal bin or "dumpster" located in the non-coal waste area identified on Plate 5-2. Metal will be separated from other forms of trash for salvage. Material not salvageable will be transported to the East Carbon Development Corporation (ECDC) dump or other approved disposal site for permanent disposal. Once a dumpster has reached capacity, the full dumpster will be replaced with an empty dumpster, and then the full dumpster will be hauled by a contract hauler to the specified disposal site.

Equipment & Supplies Storage Area

The equipment and supply storage area is approximately 350' by 400'. This storage area will be used to store mine supplies and equipment from the time of delivery until they are needed underground. Supplies such as timbers, bolts, plates, rock-dust, pipes, resin, screens, concrete blocks, steel, cables, and numerous other materials may be stored in this area. Equipment both new and used will be stored in this area. Many various longwall pieces such as shields, pan-lines, shears, chains, head and or tail drives, transformers, belt drives, pumps and numerous other material will be stored in this storage area. This secure area provides for a good storage area for diesel, gasoline, hydraulic, and roadway chemicals. All oil tanks will have appropriately designed berms or retaining walls. The equipment and supplies storage area is shown on Plate 5-2. Any explosives will be stored here according to appropriate MSHA regulations.

Topsoil Pile

The topsoil pile has been located on the south west end of the surface facilities. The pile has been designed to contain adequate topsoil for redistribution according to the reclamation plan found in Chapter 5. The proposed location provides for good protection from wind contamination as well as protection from mine related activities. The location of the topsoil pile is shown on Plate 5-2.

Mine Development Waste Pile

A temporary mine development waste area has been designed to provide a location for the storage of underground development waste that is brought to the surface. Any underground development waste, other than rock slope material, will be placed in the temporary pile then blended back into the coal stream for sale. The rock slope material will be used as fill as per Appendix 5-7. The capacity of the temporary pile will only be a few hundred tons. The area for the rock slope material is shown on Plate 5-2.

Sediment Pond

The sediment pond has been design to provide for adequate sediment protection for the project area. All water running off the disturbed area will be routed into the sediment pond for treatment. The sediment pond has been designed according to the appropriate R645 regulations and the designs can

be found in Appendix 7-4 and Plate 7-6. Because the sediment pond does not fit into the requirement of 30 CFR 77.216(a) an MSHA number for the proposed pond is not required. The sediment pond is located on the southwest end of the property and shown on Plate 5-2.

Slope Access / Portal Access Road

The slope access road splits off the facility access road near the northeast corner of the equipment and supply storage area, and follows an alignment that takes into consideration grade and direct access. The slope access road will be used to provide access to the rock slopes which in-turn provide access to the underground workings. The slope access road will be used as access for all men, material and equipment need in the mine. Since the slope access road provides for frequent access for men, equipment and materials for a period of six months or longer the slope access road is classified as a primary road and will be paved. The slope access road will be designed, constructed, and maintained according to appropriate R645 regulations. The slope access road is shown on Plate 5-2.

Rock Slopes

Access to the underground workings of the Lila Canyon Mine will be provided by two rock slopes driven from the top of the Mancos shale up-dip to the intersection of the coal seam. One portal will provide for access for men, equipment and material to the mine. The second access slope will contain the run of mine belt line from the underground workings of the mine to the run of mine stock pile. There is a possibility that only one larger slope will be driven and then divided, to provide for two separate entries. The two 1,227 foot long slopes will slope up at approximately 12%, from a starting elevation of approximately 6150'. The intersection of the coal seam and the rock slope will take place at approximately 6,300 feet elevation. The length of the slopes were minimized by taking advantage of the coal seam dip which is approximately 12% to the east. The rock material removed from the slopes will be used as fill material for the surface facilities. The rock slope material / underground development waste will contain mostly shale, sandstone and mudstone. Traces of coal may be found but the amount will be insignificant. There are no known coal seams or significant rider seams found below the Sunnyside Seam in the Lila Canyon Portal Area. The rock slope locations are shown on Plate 5-2.

Mine Facilities Road / Truck Loadout Road

The mine facility road shown on Plate 5-2 begins at the edge of County Road 164 and allows for access to the various surface facilities. The road has been located in the most practical location taking into consideration grade, stability, and alignment. Employees will use this road to access the office & bathhouse facilities. Coal haul trucks will use this road to access the scales and truck loadout. All supplies will be hauled on a short portion of this road from the supply storage area to the slope access road. The road will be paved during construction of the facilities and before coal mining operations begin in order to minimize dust and provide good surface for heavy truck traffic as well as facility access. The facility access road will be approximately 24' wide to provide for two lane traffic and will have the appropriate drainage controls to insure long term life and low maintenance. The road has been constructed and will be maintained according to the appropriate R645-534 and R645-527 regulations.

Office/Bathhouse/Visitor Parking Area

Parking will be as shown on Plate 5-2. Parking facilities for office, mine, and warehouse employees will be provided jointly as shown. This area will also provide parking for all vendors, and visitors. The surface of the 220' by 350' area will be paved. The parking area is located and designed to allow for convenient and safe parking of personal vehicles. The sewer tank and drain field will be located on the north end of this parking area.

Mine Parking

A mine parking area will be provided as shown on Plate 5-2. The mine parking area is where all mine and mine related mobile equipment will be parked when on the surface. This is the location where the underground work crews will be loaded into man trips for transportation to the various work areas. The mine parking area will be paved. The mine parking area will be approximately 70' by 220'.

Fuel Tanks

Fuel tanks will be located in the Equipment & Supplies Storage Area and be installed as discussed under Equipment & Supplies Storage Area. A 1,500 gallon diesel tank, 500 gallon hydraulic tank and a 500 gallon gasoline tank will be needed.

Powder and Cap Magazines

Powder and cap magazines will be mobile temporary, and supplied by the explosive distributor. Upon reclamation the powder and cap magazines will be returned to the distributor.

As per the approved Air Quality Order all roads will be paved and the pad areas used by mobile equipment will be treated with water or dust suppressant, open stockpiles will be watered as conditions warrant.

- 521.** Included in this section are maps, cross sections, narratives, descriptions and calculations used to satisfy the relevant requirements. This section describes and identifies the lands subject to coal mining and reclamation operations covering the estimated life of the project.

521.100 This application includes the cross sections, maps and plans needed to present the relevant information required by the Division. This information includes the following:

521.110. Plate 5-1 Shows area previously mined and approximate dates of mining.

521.111 Plate 5-1 of part 'B' and 2-2 of part "A" shows the location and extent of known workings of inactive, or abandoned underground mines. The surface portals or mine openings to the surface are shown. Plates 5-1 and 2-2 of part "A" have been prepared and certified by or under the direction of a registered professional engineer.

Doelling lists several coal mines and mining activity in within or adjacent to the permit area. Doelling lists the Calkins prospect, the Lila Canyon prospect, and the Prentiss prospect. In addition Doelling lists several coal mines Prentiss, Utah Blue Diamond, Blue Diamond and Heiner Mines. The research has shown that the Prentiss, Utah Blue Diamond, Blue Diamond and Heiner Mines were engulfed by the Book Cliffs mine. The Lila Canyon prospect refers to the old Lila Canyon mine fan portals used to ventilate the Geneva (Horse Canyon mine. The Calkins prospect is believed to have been engulfed by the Geneva mine.

An outcrop fire has been detected in an area north of the exiting permit area "A". The fire is off the permit area and located in an area that has been sealed from the old horse canyon works. The outcrop fire is not anticipated to cause any problems with mining at the Lila Canyon Mine.

521.112 No surface mined areas are found within the permit area. Therefore, this section does not apply.

521.120 Three existing structures, a 48" and a 60" CMP culvert located near the new proposed sediment pond, and the Little Park Road can be found at the Lila Canyon Mine. The existing culverts are shown on plate 5-1A and the road on Plate 5-1. Existing Horse Canyon facilities are discussed in part "A" of this plan.

521.121 There are no buildings within 1000 feet of the proposed permit area for the Lila Canyon Mine, Part "B".

521.122 There are no subsurface man-made features, other than the culverts discussed in 521.200, within, passing through, or passing over the proposed permit area for Part "B".

521.123 Plate 4-1, as well as others, shows the existing county road 126 which is located partly within 100 feet of the proposed permit area. In Addition, the Little Park road is located above the surface facilities within the permit area. The Little Park road is also shown on plate 4-1

521.124 There are no known existing areas of spoil, waste, coal development waste, or non-coal waste disposal, dams, embankments, other impoundments, and water treatment and air pollution control facilities within part "B" of the proposed permit area. This section is not Applicable.

521.125 There are no existing sedimentation ponds, permanent water impoundment, coal processing

waste banks or coal processing waste dams near or within the permit area.

- 521.130** Landowner and right of entry maps are included in the permit application. These maps and cross sections show the following:
- 521.131** Plate 4-1 shows the surface ownership and Plate 5-4 shows the coal ownership of land included in or contiguous to the permit area.
- 521.132** The applicant has the legal right to enter and begin coal mining and reclamation operations on all areas shown within the permit area. The permit area is shown on Plates 5-3 and 5-4 as well as others.
- 521.133** Coal mining or reclamation operations are planned within 100 feet of a public road. There are no plans to relocate public roads.
- 521.133.1** Emery County has given permission to conduct coal mining or reclamation operations within 100 feet of the county road. (See Appendix 1-4)
- 521.133.2** The current permit does not propose any relocation of public roads. Therefore, this section is not applicable.
- 521.140** [See Appendix 5-9 for Ventilation Breakout information.](#) Mine maps and permit area maps and or cross-sections will clearly indicate the following:
- 521.141** Plate 5-1 shows the permit boundary and Plate 5-2 shows the disturbed area boundary. Additional subareas that might require additional permits are addressed in Section 112.800 and 4-1B.
- 521.142** The underground workings are shown on Plate 5-5.
- 521.143** The proposed disposal site for placing the slope rock is shown on Plate 5-2 as well as other

appropriate plates.

- 521.150** Plates 6-2, 6-3, and 6-4, show surface contours that represent the existing land surface configuration of the proposed permit area. [See Appendix 5-9 for Ventilation Breakout information.](#)
- 521.151** The Plates show the surface contours for all areas to be disturbed as well as over the total permit area. The Plates showing the surface contours has been prepared by or under the supervision of a registered engineer.
- 521.152** No previously mined areas are included within Part "B". Therefore this section does not apply.
- 521.160** The maps, plates, and cross sections associated with this chapter clearly show:
- 521.161** Proposed buildings, utility corridors, and facilities are shown on Plate 5-2 as well as others.
- 521.162** Area of land affected according to the sequence of mining and reclamation is shown on the appropriate plates.
- 521.163** Land for which a performance bond will be posted is shown on the appropriate plate. Plate 5-2 as well as others show the area for which the performance bond will be posted. All disturbed areas within the permit boundary has been bonded.
- 521.164** Coal storage and loading areas are shown on Plate 5-2 and certified as required. Additional information can be found in Appendix 5-4.
- 521.165** Topsoil, and waste piles are shown on Plate 5-2 as well as others.
- 521.166** The waste disposal areas are shown for non-coal waste and underground mine waste on Plate 5-2.
- 521.167** No explosives are expected to be stored on site.

However, if explosives are stored they will be stored as discussed in Section 520. on Plate 5-2.

- 521.168** Since Lila Canyon mine is an underground operation this paragraph is not applicable.
- 521.169** The refuse pile is shown on Plate 5-2 and discussed in Appendix 5-7.
- 521.170** Transportation facility maps describing roads, and conveyor maintained within the permit is shown with descriptions of roads, embankments, culverts, and drainage structures are presented in section 520 and are shown on Plates 5-2, and 7-2.
- 521.180** Support facilities are described in section 520 and are shown on Plate 5-2. Plate 5-2 is the official disturbed area boundary map.
- 521.190** Other relevant information required by the Division will be addressed.
- 521.200** Signs and markers will:
- 521.210** Signs and markers will be posted maintained, and removed by the person who conducts the coal mining and reclamation operations.
- 521.220** Signs and markers will be of uniform design that can be easily seen and read and be made of durable material and conform to local laws and regulations.
- 521.230** Signs and marker will be maintained during all activities to which they pertain.
- 521.240** Mine and Permit Identification Signs.
- 521.241** Mine and permit identification signs will be displayed at each point of access from public roads to areas of surface operations and facilities on permit areas.
- 521.242** Since Lila Canyon Mine is an underground operation, this section is not applicable.

- 521.243** Mine and permit identification signs where required, will show the name, business address, and telephone number of the permittee and the identification number of the permanent program permit authorizing coal mining and reclamation operations.
- 521.244** Mine and permit identification signs will be retained and maintained until after the release of all bonds for the permit area.
- 521.250** Perimeter Markers
- 521.251** The perimeter of all areas affected by surface operations or facilities before beginning mining activities will be clearly marked with perimeter markers.
- 521.252** Since Lila Canyon Mine is an underground operation this section is not applicable.
- 521.260** Buffer Zone Markers
- 521.261** Signs will be erected to mark buffer zones as required and will be clearly marked to prevent disturbance by surface operations and facilities.
- 521.262** Since Lila Canyon Mine is an underground operation this section is not applicable.
- 521.270** Topsoil Markers. Markers will be erected to mark where topsoil or other vegetation-supporting material is physically segregated and stockpiled.

522. Coal Recovery

Additional Details can be found in the R2P2 on file at the BLM Office.

Effective barrier and pillar designs are essential for safe and productive underground mining. Barrier pillars will be sized according to accepted engineering practices. One or more of the following methods may be used to properly size barrier pillars: Dunn's Rule, the Old English Barrier Pillar Law, Pennsylvania Mine Inspector's Formula, Ash and Eaton Impoundment

Formula, Pressure Arch Method, British Coal Rule of Thumb, North American Method, Holland Rule of Thumb, or Holland Convergent Method.

Regardless of the methods or care taken to properly size barrier pillars the true effectiveness on any design can only be determined by conducting full-scale in-mine performance evaluations. Mine experience and history in the local area will have as much influence on pillar sizes as does the engineering formulas.

Barrier pillars will be utilized to isolate the abandoned Horse Canyon Mine from the new Lila Canyon Mine. Barrier pillars will also be used to simplify ventilation, to provide independent escape routes and to possibly retain large quantities of mine water. Barrier pillars will be employed along the outcrop in order to maintain ventilation courses.

A barrier pillar where no second mining will be allowed within the barrier will be used to protect the escarpments. The width of the escarpment barrier will be determined by implementing a 21.5° angle of draw project downward from the surface to the coal seam. Development mining or first mining will be allowed within the escarpment barrier.

For longwall mining applications the abutment loading is of prime importance. Initial longwall pillars will be designed using the ALPS method. Again mine experience and history in the local area will have as much influence on pillar sizes as does the engineering formulas.

Mine pillars will be sized taking into consideration the coal strength, depth of cover, width and height of pillars using one or more of the following methodologies: Obert-Duvall, Holand-Graddy, Holland, Salamon-Munro, or Bieniawski. Again mine experience and history in the local area will have as much influence on pillar sizes as does the engineering formulas.

523. Mining Methods:

Mining will begin in Section 15, T16S, R14E, in the Sunnyside seam. Development of the Sunnyside 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 12% from the base of the cliffs.

Production during the first year is estimated to be 200,000 tons, the second through the fifth year production should be between 1,000,000 and 1,500,000 using continuous mining methods. If and when tonnage demand increases

to justify longwall mining, production could peak as high as 4,500,000 tons a year and continue at that level for the life of the mine.

Mine production will begin with the slope construction. Once the coal is encountered development will continue using continuous miners and various haulage types. Battery, cable, or continuous haulage may be used in conjunction with continuous miners in development. Continuous miners will account for all the production during the first two to five years. Mining will consist of driving mains, developing room and pillar panels and gate entries for future longwall mining.

The majority of the second mining will be performed using longwall equipment. However, in isolated areas room and pillar type of mining may be used in areas not suitable for longwall mining. Longwall panels are sited approximately parallel lengthwise to the strike with a slight up dip orientation to provide drainage for the development faces. This practice will be applied to the continuous miner panels wherever possible. (See plate 5-5)

Roof control and ventilation plans will be submitted to MSHA and approved prior to any underground mining activities.

An air quality permit from the State Division of Air Quality has been obtained and will be modified as needed.

Ventilation of the mine will be by an exhaust and or blowing type system. It has been estimated that 900,000 cfm will be required at full production. Intake air will be supplied by slopes and entries from the surface.

A water supply system will be installed. Potable water from an approved source will be hauled by truck and stored in a mine site storage tank located near the man and coal slope portals. Alternative sources for potable water are being considered. A treatment plant may be indicated. Process water will be hauled from the Price River or other approved source by truck and stored in another mine site storage tank. It is anticipated that once the old two entry development panel is encountered that adequate process water may be obtained from the old works. This process water will provide for dust control, water to the mine and fire suppression. Mine water will be used with the process water. See Appendix 7-3 (PHC) for water usage calculations.

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 at 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. Part 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.

Underground mining equipment to be used at Lila Canyon is typical of most room-and-pillar and longwall mine. A list of major equipment which may be used underground is listed below additional equipment not on the list may be used as needed.

- Continuous Miners
- Roof Bolters
- Battery Shuttle Cars
- Electric Shuttle Cars
- Diesel Ram Cars
- Feeder Breakers
- Continuous Haulage Units
- Battery Scoops
- Diesel Scoops
- Diesel Service Vehicles
- Diesel Material Haulers
- Diesel
- Belts and Terminal Groups
- Battery and Diesel Man Trips
- Longwall Shields
- Longwall Pan-lines
- Longwall Shears
- Longwall Stage-loaders
- Longwall Pumps
- Various Water Pumps
- Various Transformers and Switches
- Rock Drills
- Loaders

523.100 No Surface Coal Mining and Reclamation Activities are proposed to be conducted within the permit area within 500 feet of an underground mine, therefore this section is not applicable.

523.200 No Surface Coal Mining and Reclamation Activities are proposed with 500 feet of an underground mine, therefore this section is not applicable.

523.210 No Surface Coal Mining and Reclamation Activities are proposed to be conducted within the permit area within 500 feet of an underground mine, therefore this section is not applicable.

523.220 No Surface Coal Mining and Reclamation Activities are proposed to be conducted within the permit area within 500 feet of an underground mine, therefore this section is not applicable.

524. Blasting and Explosives: Surface blasting activities incident to underground coal mining is planned for the Lila Canyon mine during construction of the access slopes only.

524.100 Steps have been taken to achieve compliance with the blaster certification program and is described in this permit application.

524.110 Surface blasting involving 5 lbs of explosives or more will be conducted under the direction of a certified blaster.

524.120 Blasting certificates will be carried by the blasters or will be on file at the permit area during blasting operations.

524.130 The blaster and at least one other person will be present at the firing of a blast.

524.140 Persons responsible for blasting operations at a blasting site will be familiar with the blasting plan, if required, and site-specific performance standards and give 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.

524.200 Since the planned blasting does not meet the requirements of 524.211 or 524.212 a blast design is not included in the permit application. If in the future blasting falls under section 524.200 then a plan will be submitted to Division for approval.

524.210 Since the planned blasting does not meet the requirements of 524.211 or 524.212 anticipated blast designs are not required.

524.300 Since planned blasting requires more than 5 lbs of explosives

the preblasting survey is addressed where applicable in this permit application.

524.310 There are no dwellings or other structures located within one-half mile of the permit area owned by anyone but the operator. The operator will prepare the preblast survey if required. Notification procedures implied in this section are not applicable.

524.320 Since the operator is the only owner of structures and no dwelling exist within one-half mile of any part of the permit area this section is not applicable.

524.330 Because the operator is the only owner of structures or dwellings within one-half mile of any part of the permit area, this section is not applicable.

524.340 Because the operator is the only owner of structures or dwellings within one-half mile of any part of the permit area, this section is not applicable.

524.350 Because the operator is the only owner of structures or dwellings within one-half mile of any part of the permit area, this section is not applicable.

524.400 The blast schedule is as follows:

524.410 Since there are no residents within one-half mile of the projected blasting site this section does not apply.

524.420 All surface blasting will be conducted between sunrise and sunset unless nighttime blasting is approved by the Division.

524.430 Since there are no residents within one-half mile of the projected blasting site this section does not apply.

524.440 Since there are no residents within one-half mile of the projected blasting site a flexible blasting schedule is allowable. Surface blasting may take place anytime during daylight hours, unless approved differently by the Division.

- 524.450** Because of the remote location of the Lila Canyon Mine, over six miles from the nearest locality (Columbia), this section does not apply.
- 524.460** Since the town of Columbia is the nearest locality, and is over six miles distance from the permit area, this section does not apply.
- 524.500** The blasting signs, warnings and access control is described below.
- 524.510** Blasting signs will meet the specifications of R645-301-521.200. The following will apply.
- 524.511** Signs reading "Blasting Area" will be conspicuously place at the point where any road provides access to the blasting area.
- 524.512** The signs posted at all entrances to the permit area from public, roads, or highways will be placed in a conspicuous location and will state "Warning! Explosives in Use" and will clearly list and describe the meaning of the audible blast warning and all clear signals that are in use.
- 524.520** Audible warning and all-clear signals of different character or pattern will be given. Each person within the permit area will be trained in the meaning of the signals.
- 524.530** Access within the blasting area will be controlled until an authorized until the operator has reasonably determined the following:
- 524.531** No unusual hazards, such as imminent slides or undetonated charges, exist; and
- 524.532** Access to and travel within the blasting area can be safely resumed.
- 524.600** Adverse blasting effects are described as follows:

- 524.610** Blasting will 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.
- 524.620** Airblast Limits
- 524.621** Since all structures are either owned by the permittee and not leased to another person or are located over six miles distance from the permit area, this section does not apply.
- 524.622** Since all structures are either owned by the permittee and not leased to another person or are located over six miles distance from the permit area, this section does not apply.
- 524.630** Monitoring: Since all structures are either owned by the permittee and not leased to another person or are located over six miles distance from the permit area, this section does not apply.
- 524.640** Ground Vibration: Since all structures are either owned by the permittee and not leased to another person or are located over six miles distance from the permit area, this section does not apply.
- 524.650** Since all structures are either owned by the permittee and not leased to another person or are located over six miles distance from the permit area, this section does not apply.
- 524.660** Since all structures are either owned by the permittee and not leased to another person or are located over six miles distance from the permit area, this section does not apply.
- 524.670** Since all structures are either owned by the permittee and not leased to another person or are located over six miles distance from the permit area, this section does not apply.
- 524.680** Since all structures are either owned by the permittee

and not leased to another person or are located over six miles distance from the permit area, this section does not apply.

524.690 Since all structures are either owned by the permittee and not leased to another person or are located over six miles distance from the permit area, sections 524.620 through 524.632 and 524.640 through 524.680 do not apply.

524.700 Records of blasting operations will be maintained at the mine site for at least three years and will be available for inspection by the Division or the public. Blasting records will contain the following information.

524.710 Blasting records will include.

524.711 The name of the operator will be on the blasting record.

524.712 The location, date, and time of the blast will be recorded on the blasting record.

524.713 The name, signature, and certification number of the blaster will be recorded on the blasting record.

524.720 Since all structures are either owned by the permittee and not leased to another person or are located over six miles distance from the permit area, this section does not apply.

524.730 Weather conditions will be recorded on the blasting record.

524.740 A record of the blast will include the following:

524.741 The type of material blasted will be recorded on the blasting record.

524.742 Sketches of the blast pattern including number of holes, spacing, burden, decks, and delay pattern will be recorded on the blasting record.

- 524.743** The diameter and depth of holes will be recorded on the blasting record.
- 524.744** The type of explosives used will be recorded on the blasting record.
- 524.745** The total weight of the explosives used per hole will be recorded on the blasting record.
- 524.746** The maximum weight of explosives detonated in an eight-millisecond period will be recorded on the blasting record.
- 524.747** Information on the initiation system will be recorded on the blasting record.
- 524.748** The type and length of the stemming will be recorded on the blasting record.
- 524.749** Mats or other protections used will be recorded on the blasting record.
- 524.750** Since all structures are either owned by the permittee and not leased to another person or are located over six miles distance from the permit area a record of seismographic and airblast information is not required.
- 524.760** Since a blasting schedule is not required this section does not apply.
- 524.800** The operator will comply with the various appropriate State and Federal laws and regulations in the use of explosives.
- 525. Subsidence:** The permittee will comply with the appropriate R645-301-525 requirements.
- 525.100** Subsidence Control Plan
- 525.110** Plate 5-3 shows the location of State appropriated water and 5-3 (Confidential) shows the eagle nests that potentially could be diminished or interrupted by subsidence.

525.120 SUBSIDENCE POTENTIAL (See also Section 5.4 of Part “A”)

A review of renewable resources in and adjacent to the permit area found resources consisting of ground water, grazing, timber, and recharge areas. Subsidence from underground coal mines has been believed to affect overlying forest and grazing resource lands in the following ways:

- o Formation of surface fissures which intercept near surface soil moisture thus draining the water away from the root zone with deleterious effects.
- o Alterations in ground slope and destabilization of critical slopes and cliffs.
- o Modification of surface hydrology due to the general downward migration of surface water through vertical fractures.
- o Modification of groundwater hydrology including connection of previously separated aquifers, reduction in flows of seeps and springs which rely upon tight aquitards for their flow, and changes in recharge mechanisms.
- o Emissions of methane originating from the coal seam through open fissures to the surface or at least the base of the surficial soil which has been known to have deleterious effects on woody plants.

Because these renewable resources exist with and adjacent to the permit area, a subsidence control plan is required. This plan is presented in Section 525.400.

A great deal of baseline data is available from many mining settings to develop subsidence damage criteria for surface structures (Bhattacharya et al. 1984). The formation of cracks and fissures are the general effects of subsidence and can have minor deleterious effects on groundwater resources without any fissuring to the surface. In the arid areas of Utah, impacts to and modification of the groundwater regime can be disruption of flow from natural seeps and springs which rely on the permeability contrast of interbedded sandstones and shale for their flows. These water resources are generally near

surface occurrences and are essentially surface waters and subject to the same limiting damage criteria as surface water bodies. Subsidence damage to surface water bodies has been studied by a number of workers including Dunrud (1976), Wardell and Partners (1976), and U.S. Bureau of Mines (1977). The results of the Wardell and Partners studies of subsidence effects in a number of countries indicates that the limiting strain for the onset of minor impacts to surface waters is approximately 5×10^{-3} . The SME Mining Engineering Handbook also suggests a limiting extension strain value of 5×10^{-3} for pasture, woodland, range or wildlife food and cover.

Table 10.6.19 in the Mining Engineers Handbook suggests that the minimum safe cover required for total extraction of the coal resources under surface waters is approximately 60 times the seam thickness for coal beds at least 6 feet thick or approximately 450 feet. In their review of the foregoing, Singh and Bhattacharya (1984) recommended that the same limiting safe strain values and cover thickness ratios be used for protecting groundwater resources and recharge areas over coal mines. Where extension strain is greater than this limiting value, it is likely that surface fissures and cracks may develop. As the strain value decreases below the limiting value, the potential for surface damage decreases.

Figure 1 in Appendix 7-3 shows a typical subsidence profile. As shown in Figure 1, the zones are: a caved zone that occurs in the 6 to 10 times the thickness of the coal seam, a fractured zone which occurs 10 to 30 times the thickness of the coal seam, and deformation zone which occurs 30 to 60 times the thickness of the coal seam, and finally, a soil zone which occurs on the ground surface. The cover thickness of 1,000 to over 2,000 feet, over most of the mine area is also much greater than the limiting thickness of 630 feet recommended by International Engineers Inc. (1979) ($10.5' \times 60$).

The Lila Canyon mine will be a longwall operation. As projected, 15 longwall panels at various depths will be mined. The longwall panels are laid out with the gate roads running along the strike roughly north-south, which will result in the longwall shear cutting up and down the dip. The depth of cover over the longwall panels approaches but never gets less than 500 feet toward the southwest and increases to over 2500 feet

in the northeast. Only three of the 13 planned longwall panels are under less than 1,000 feet of cover. The remaining 10 panels are under 1,000 plus feet of cover. Maximum subsidence is expected to be approximately 9.5 feet in the areas approaching 500 feet of cover and less than 3' in the deeper cover areas. Extension strain varies from 12.4×10^{-3} in the 500 foot cover areas to $.9 \times 10^{-3}$ in the 2,500 foot cover areas. Extension strain values of 5.0×10^{-3} and above occurs in areas of approximately 1000' of cover and less.

A typical longwall panel at the Lila Canyon Mine will have dimensions of approximately 950 feet wide and up to 7,000 feet long and 2,000 feet deep. Using the methods described in the National Coal Board's *Subsidence Engineers' Handbook*, the S/m ratio for this geometry would be 0.38 where "S" is the maximum subsidence and "m" is the seam extraction thickness. For an average seam extraction thickness of 10.5 feet, the total subsidence would be 4.0 feet. However, as described above, the major impacts of this subsidence are due to extension strains and not total vertical subsidence. The prediction of average extension strain is accomplished with the use of the formula:

$$+E = 0.75 S/h \text{ where } S=\text{subsidence, and } h=\text{depth of cover}$$

NOTE: The .75 factor is only an average. The factor changes with various w/h ratios. Figure 15 found in NCB's Subsidence Engineers Handbook takes into account the w/h ratio.

The solution of this equation for the Lila Canyon Mine configuration discussed above produces a predicted, average extension strain of 1.5×10^{-3} which is less than the limiting strain of 5×10^{-3} for protecting surface waters, groundwater sources, pasture, woodland, range or wildlife food and cover. Thus, it is unlikely that the gradual compression expected over much of the subsidence area will have any deleterious effects on the overlying renewable surface resources.

The table below shows the expected subsidence amount and expected extension strain for longwall panels at various mining depths. These calculations were done for a flat multiple seam mining. There are adjustments for single seam mining and for dipping seams. However, these adjustments are minor and are not expected to result in significant changes in values.

**Maximum Subsidence
& Expected Extensive
Strain (NCB 1975)**

	Feet	Meters
Panel Width =	900	274
Seam Height =	10.5	3

Depth of Cover		Width to Depth (a)	Maximum Subsidence(S)		Factor NCB Fig. 15	Extension Strain (E)
<u>Feet</u>	<u>Meters</u>	<u>Ratio</u>	<u>Feet</u>	<u>Meters</u>	<u>Factor</u>	<u>x 10³</u>
500	152	0.9	9.5	2.9	.65	12.4
1000	305	0.75	7.9	2.4	.66	5.2
1100	335	0.71	7.5	2.3	.68	4.6
1200	366	0.68	7.1	2.2	.70	4.1
1300	396	0.65	6.8	2.1	.70	3.7
1400	427	0.59	6.2	1.9	.75	3.3
1500	457	0.54	5.7	1.7	.78	3.0
2000	610	0.38	4.0	1.2	.82	1.6
2500	762	0.28	2.9	0.9	.80	0.9

The most favored technique until recently has been the use of the empirical charts developed by the National Coal Board (NCB). The above calculations were obtained using the empirical charts developed by the National Coal Board (NCB). Comparisons, as stated in the SME handbook, of US subsidence data with NCB predictions highlight the following differences between coalfields in the US and UK: Most of the studies in the US are limited to the Eastern US coalfields with a very limited data base applicable to western conditions.

With the exception of Illinois, maximum subsidence factors observed in US coalfields are less than predicted by NCB.

The limit (draw angles in the US coalfields tend to be less than the 35 degree value generally accepted by NCB.

The points of inflection of the subsidence profiles over US coal mines are generally closer to the panel centerline compared to the NCB profile. This effect is dependent not only on the percentage of competent strata in the overburden but also on their locations relative to the ground surface and their thickness.

Surface strains and curvatures observed over US longwall panels have been shown to be significantly higher than NCB predictions, almost four times larger in many cases.

The pace at which subsidence occurs depends on many controls including the type and speed of coal extraction, the width, length and thickness of the coal removed, and the strength and thickness of the overburden. Observations of subsidence by Dunrud over the Geneva and Somerset Mines indicate that subsidence effects on the surface occurred within months after mining was completed, and the maximum subsidence was essentially completed within 2 years of the completion of retreat mining.

Dr. Roy Sidle found in his study of Burnout Creek that subsidence impacts to streams are temporary and self healing.

The Sidle Study is representative of the conditions found in the Lila area because:

- the lithology is very similar between the Book Cliffs and the Wasatch Plateau
- the cover thickness ranges from 600 - 800 feet which falls within the range expected at Lila, and
- the seam thickness of 8-10 feet is in the same range expected at Lila.

An Executive Summary of his study and published findings follows:

Title : Stream response to subsidence from underground coal mining in central Utah

5. Authors: Sidle-RC Kamil-I Sharma-A Yamashita-S

Short-term geomorphic and hydrologic effects of subsidence induced by longwall mining under Burnout Creek, Utah were evaluated. During the year after longwall mining, 0.3-1.5 m of subsidence was measured near impacted reaches of the mountain stream channel. The major channel changes that occurred in a 700-m reach of Burnout Creek that was subsided from 1992 to 1993 were: (1) extent glides; (2) increases in pool length, numbers and volumes;

(3) increases in median particle diameter of bed sediment in pools; and (4) some constriction in channel geometry. Most of the changes appeared short-lived, with channel recovery approaching pre-mining conditions by 1994. In a 300-m reach of the South Fork drainage that was subsided from 1993 to 1994, only channel constriction was observed, although any impacts on pool morphology may have been confounded by heavy grazing in the riparian reaches during the dry summer of 1994. Similar near-channel sedimentation and loss of pool volume between 1993 and 1994 were noted throughout Burnout Creek and in adjacent, unmined James Creek. Subsidence during the 3-year period had no effect on baseflows or near-channel landslides.

No major impacts of subsidence to the surface, caused by the underground mining methods proposed during the permit term are anticipated.

The coal seam is approximately 12.5 feet thick with only about 10.5 feet being extracted, and the depth of cover ranges from 0' to approximately 2,500'. The rocks overlaying the coal seam are sandstones and mudstones with some thin bands of coal. Due to the strength of the overburden, and depth of workings, even with full seam extraction, only minimal subsidence, if any, is anticipated.

Some surface expressions of tension cracks, fissures, or sink holes may be experienced but should be insignificant. The chances of subsidence-related damage to any perceived renewable resource is minimal.

All dirt roads above the mine are in areas in excess of 1,000 feet of cover or in areas where mining will not take place. The chance of subsidence negatively effecting these dirt roads is minimal. However, in the unlikely event that cracks, fissures or sink holes are observed as a result of subsidence, the road will remain accessible by regrading and filling in the cracks, fissures or sinkholes.

The unnamed ephemeral channel in the southwest corner of the permit area is located in an area where no mining is planned or over the top of a bleeder system that will not be second mined. The chance of subsidence negatively effecting this ephemeral channel

is minimal. However, in the unlikely event that cracks, fissures or sink holes are observed as a result of subsidence the channel will be regraded and the cracks, fissures or sinkholes will be filled in by hand methods due to its inaccessibility.

A small portion of Little Park Wash, which is ephemeral, has less than 1,000 feet of cover in the southwest corner of the permit area. The portion with less than 1,000 feet of cover runs diagonally across one longwall panel and then parallel to the bleeder system in the second longwall panel. In the unlikely event that cracks, fissures or sink holes are observed as a result of subsidence the channel will be regraded and cracks, fissures or sinkholes will be filled in. Since this stream channel is accessible and is traversable by 4 wheel drive, access for repairs would not be a problem. If any subsidence repairs cannot be fixed using hand methods, small earth moving equipment could be used.

DWR and BLM Wildlife Biologists, in consultation with the Division, have determined that any loss of snake dens to subsidence would be random and a minor impact to the population of snakes.

525.130

A survey was conducted within the proposed permit area and adjacent area and it was determined that limited renewable resource lands exist within the area surveyed. Limited areas were found which contribute to the long-range productivity of water supply or fiber products. No structures exist within the permit area in which subsidence, if it occurred, could cause material damage or diminution for reasonably foreseeable use. See Plates 5-5 and 5-3 for areas of potential subsidence. Identification and data for the State appropriated water supplies can be found in chapter 7 section 727.

All State Appropriated water rights within the maximum limit of subsidence that could be affected, are either owned by the Operator or by the BLM. The BLM has been notified of the water rights survey by means of the submittal of the permit application.

According to Mark Page (State Water Rights), there is not a water conversation district associated with Lila Canyon Mine.

525.200. Protected Areas

525.210. Since there are no public buildings or other facilities such as churches, school or hospitals, and since there are no impoundments with a storage capacity of more than 20 acre-feet, this section does not apply.

525.220. Since R645-301-525.210 does not apply, this section does not apply.

525.230. Since there are no planned operations under urbanized areas, cities, towns, and communities, or adjacent to industrial or commercial buildings, major impoundments, or perennial streams this section does not apply.

525.240. A detailed plan of the underground workings, including maps and descriptions 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, and areas of full extraction can be found in the R²P² on file with the BLM local and state offices.

525.300. Subsidence control.

525.310. Measures to prevent or minimize damage.

525.311 No attempt will be made to prevent subsidence in any area except where the escarpment near the outcrop is to be protected and to insure that subsidence remains within the permit area. The use of continuous miners in a pillar section as well as longwall technology provides for planning subsidence in a predictable and controlled manner. Some surface expressions of tension cracks, fissures, or sink holes may be

experienced but should be insignificant. The chances of subsidence related damage to any perceived renewable resource is minimal. The value and foreseeable use of the surface lands will not be affected by potential subsidence.

525.312 Since there are no buildings or occupied residential dwellings or structures within the Lila Canyon project area this section does not apply.

525.313 Room-and-pillar mining in addition to longwall methods will be used at the Lila Canyon Mine.

525.400. Since state-appropriated water supplies exist on the surface, 525.400 has been addressed.

525.410 Coal will be removed using a combination of continuous miner and long wall methods as described in sections 522 and 523. Sequence and timing for the development of underground workings are also discussed in sections 522 and 523.

525.420 Plate 5-5 shows the underground workings and depicts areas where first mining or partial mining will be utilized to protect the escarpment and raptor nests that may exist on the escarpment, and to insure that subsidence remains within the permit area. State-appropriated water rights are shown on Plates 5-3, 5-5 as well as Plate 7-1.

525.430 No major impacts of subsidence to the surface caused by the underground mining methods proposed during the permit term are anticipated.

The coal seam is approximately 12.5 feet thick with only about 10.5 feet being extracted, and the depth of cover ranges from 0' to approximately 2,300'. The rocks overlaying the coal seam are sandstones and mudstones with some thin bands of coal. Due to the strength of the overburden and depth of workings, even with full seam extraction, only minimal subsidence if any is anticipated.

525.440 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" horizontally and vertically. From this data a map will be created that will show subsided areas. Once per year a follow up aerial will be performed to determine the extent and degree of active subsidence. Subsidence monitoring will continue for a minimum of 5 years after the mining ceases. If at the end of the 5 year period the annual subsidence in any of the 3 prior years measures more than 10 percent of the highest annual subsidence amount, subsidence monitoring will continue until there are 3 consecutive years where the annual subsidence amount is less than 10 percent of the highest annual subsidence amount. If for three years in a row the subsidence is measured to be less than 10% of the highest subsidence year, subsidence will be determined to be complete, and no additional monitoring for that area will be required.

"A ground survey of the mine permit area 'where secondary extraction has occurred over the last year' will be conducted in conjunction with the quarterly water monitoring program." Identified features will be monitored until they are repaired or self-healed. The survey will be conducted on roads, adjacent to stock watering ponds, and in drainage channels where they cross tension areas relative to the underground extraction areas."

"The results of this survey will be documented quarterly in a written report which provides global positioning coordinates as well as the following information;

- A) a description of the identified subsidence related feature,
- B) length, and width measurements, and compass bearing,
- C) dated photographic documentation,
- D) located on a topographic overlay map of the

- underground disturbed area.
- E) if the feature is determined as significant, the Division will be notified within a 48 hour period.
 - F) A written report, compiling the four quarterly reports for the monitoring year, will be submitted as part of the Annual Report required by the Division.
 - G) The commitment “to restore the land where subsidence damage has affected the use of the surface” must be revised to read “to restore the land where subsidence damage has been determined as significant enough to require repair, as determined by the Division”.

Two areas of the permit have stream reaches with less than 1,000 feet of cover over the coal seam. As discussed in Section 525.120, it is not envisioned that subsidence will negatively impact these areas. During periods of 2nd mining under areas of intermittent or perennial streams, a ground survey will be conducted of the stream channels every two weeks. These ground surveys will be continued for a period of 3 months following the 2nd mining.

The ground survey will consist of walking and photographing the various areas of the surface over the mine where subsidence might occur. If evidence of subsidence is identified, the area of subsidence will be surveyed and the extent of the disruption identified. Depending on the extent and location of the damage, mitigation measures will be reviewed and implemented. Due to the fact that mitigation options change with time as new technology and measures are developed, better options may be implemented in the future. However, UEI provides a commitment that where subsidence damage affects uses of the surface, the land will be restored to a condition capable of maintaining the value and reasonable foreseeable uses which it was capable of supporting before the subsidence. The surface effects will be repairs as described in Section 525.500.

525.450 Subsidence control measures.

525.451. No backstowing or backfilling of voids used as a

- subsidence control measure is planned at this time. Therefore, this section is not applicable.
- 525.452.** Support pillars as a subsidence control measure is not anticipated at this time. However, an area of partial mining where an unmined coal block will be left for subsidence control is shown on Plate 5-5. First mining indicates an area where a block of coal is roomed leaving pillars for support with no mining of the remaining pillars. Partial mining as shown on Plate 5-5 indicates an area where a block of coal has been isolated without the rooms being developed. Both first mining and partial mining will leave support that can be used to control subsidence. If the partially mined area shown on Plate 5-5 is ever roomed out, the area now defined as partially mined would become an area defined as being first mined.
- 525.453.** An outcrop barrier of coal will be left to protect the escarpments at the outcrop. As per the R2P2 only first mining will be allowed within 200' of the outcrop. Mains, submains, and ventilation portals will be allowed within the outcrop.
- 525.454** No measures will be taken on the surface to prevent material damage or lessening of the value or reasonable foreseeable use of the surface.
- 525.460.** Anticipated effects of planned subsidence may include tension cracks, fissures, or sink holes. Areas of minimal ground lowering may be anticipated. The chances of subsidence-related damage to any perceived renewable resource is minimal.
- 525.470.** Since no urbanized areas, cities, towns, public buildings, facilities, churches, schools, or hospitals exist within the permit area this section does not apply.
- 525.480.** There are no plans to change or modify the mining plan to protect any springs or seeps. Springs with water rights will be monitored for flow and quality as described in Chapter 7 Section 731.211. UEI has committed to

provide for mitigation of any lost water rights as per Chapter 7 Section 727.

525.490. Other information specified by the Division as necessary to demonstrate that the operation will be conducted in accordance with R645-301-525.300 will be provided.

525.500. Repair of damage.

525.510. If effects of subsidence are confirmed, any material damage to the surface lands will be restored to the extent technologically and economically feasible. The land will be restored to a condition capable of maintaining the value and reasonable foreseeable uses which it was capable of supporting before the subsidence.

525.520. Since no structures exist within or adjacent to the permit area which could be damaged by subsidence, should it occur, this section does not apply.

525.530. The Little Park Road exists in the subsidence zone. In the unlikely event the road is damaged by subsidence, UEI will repair the damage as per Section 525.120.

525.600. Public Notice.

At least six months prior to mining, or within that period if approved by the Division, the underground mine operator will mail a notification to all owners and occupants of surface property and structures above the 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 location or locations where the operator's subsidence control plan may be examined.

526. A narrative explaining the construction, modification, use, maintenance and removal of the mine facilities follows. Additional information can be found in Appendix 5-4 and Chapter 8.

526.100 Mine Structures and Facilities.

526.110 The only existing structures are found in Horse Canyon (Part "A" of this permit) and are the remains of the United States Steel operation. Horse Canyon has received phase II bond release and the remaining

structures have been left in place for future use. Only three existing structures, a 60" and a 48" CMP culverts located near the new proposed surface facilities, and the County road on top of Little Park, can be found within the Lila Canyon Permit. The existing culvert is shown on plate 5-1A. The existing road on Little Park can be found on Plate 5-1 as well as most other plates showing the surface area of the Lila Canyon Permit. Several vehicle ways will be used for water and subsidence monitoring. These ways branch off the Little Park Road and generally follow the ephemeral drainages. The ways are shown on Plate 5-1 as well as most other plates showing the surface area of the Lila Canyon Permit. More detail of the existing Little Park Road can be found in Appendix 5-4.

- 526.111** The location of the existing culverts is shown on Plate 5-1A.
- 526.112** Most of the existing 48" culvert is outside the permit boundary and is the Counties responsibility. UEI will grade the site so that during reclamation and operations surface flows will be directed away from the 48" culvert. The 60" culvert is in poor condition and will be replaced by the county. UEI will add on to the culvert during the operation and reclamation phase. The bottom 30' is the responsibility of the County, the upper portion is the responsibility of UEI.
- 526.113** It is believed that the existing culverts were installed with the road construction around 1940.
- 526.114** Since the existing culvert is going to be removed upon construction of the sediment pond this section does not apply.
- 526.115** Since the existing culvert is going to be removed upon construction of the sediment pond this section does not apply. The County road and the culvert within the disturbed area boundary will be modified or reconstructed by the County.

526.115.1. Since the existing culvert is going to be

removed upon construction of the sediment pond this section does not apply. See Appendix 5-4 for existing road details.

526.115.2. Since the existing culvert is going to be removed upon construction of the sediment pond this section does not apply. See Appendix 5-4 for existing road details.

526.115.3. Since the existing culvert is going to be removed upon construction of the sediment pond this section does not apply. See Appendix 5-4 for existing road details.

526.115.4. Since the existing culvert is going to be removed upon construction of the sediment pond this section does not apply. See Appendix 5-4 for existing road details.

526.116 The only coal mining and reclamation operations that are planned within 100 feet of the County Road are office complex, sediment pond, topsoil pile, and security shack. The permit area adjacent to the county road will be fenced to protect the public from the sediment pond and other mine associated buildings. Other than fencing no additional measures are planned after the construction phase. During construction measures to control traffic on the County Road will be taken to protect the public from construction related hazards.

526.116.1. A cooperative agreement with Emery County as stated in Appendix 1-4 requires a six foot chain link fence to be constructed adjacent to the Lila Canyon Road to provide safety to the general public in the proximity to the mine site and mine related structures and activities.

526.116.2. At the current time there are no plans to relocate any public road.

526.200 Utility Installation and Support Facilities.

526.210 All coal mining and reclamation operations will 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 may pass over, under, or through the permit area, unless otherwise approved by the owner of those facilities and the Division. Since no existing services are found within the projected disturbed area, no negative impact to any service is anticipated.

526.220 The new support facilities are described in section 520 and in Appendix 5-4 and shown on plate 5-2 and will be operated in accordance with the mine reclamation plan. Plans and drawings for each support facility to be constructed, used or maintained within the permit area are found in Appendix 5-4, Plates 5-7A, 5-7B, and 5-8.

526.221 The new facilities designs shown in Appendix 5-4 prevents or controls erosion and siltation, water pollution, and damage to public or private property, and:

526.222 The new facilities designs shown in Appendix 5-4 minimizes damage to fish, wildlife, and related environmental values; and minimizes additional contributions of suspended solids to stream flow or runoff outside the permit area to the extent possible by using the best technology currently available.

Islands of undisturbed areas within the permit area will be visually monitored for coal fines deposition. If monitoring reveals coal fine deposition, then water sprays on the area from which the fines are originating will be warranted as per August 27, 1999 Approval Order.

526.300 Water pollution control facilities consist of sedimentation control and properly designed sewage systems.

The sedimentation control is accomplished by containing all disturbed area runoff in a properly sized sedimentation pond. Complete designs are presented in Appendix 7-4 and on Plate 7-6.

The sewage system will consist of a septic tank and drainfield. The system is shown on Plate 5-2. Complete designs are presented in Appendix 5-4.

The drain field design and layout is shown on plate 5-2 and details are shown in Appendix 5-4.

526.400 Since Lila Canyon Mine is an underground operation this section does not apply.

527. Transportation Facilities.

527.100 All new roads within the disturbed area have been classified as primary.

527.110 See Sections 527.120 and 527.130.

527.120 The Slope Access Road / Portal Access Road and the Mine Facilities Road / Truck Loadout Road will be used frequently for access for a period in excess of six months, and or will transport coal, they are classified as primary roads.

527.121 See 527.120 above.

527.122 See 527.120 above.

527.123 Since none of the new roads planned within the disturbed area will be retained for an approved postmining land use this section does not apply.

527.130 There are no ancillary roads within the disturbed area. .

527.200 A detailed design and description for each road, and conveyor to be constructed used, and maintained within the proposed permit area is included in Appendix 5-4. The roads are show on Plate 5-

2.

- 527.210** The specifications for each road width, road gradient, road surface, road cut, fills, embankments culverts, drainage ditches and drainage structures are shown on Plate 5-2 and in Appendixes 5-4 and 7-4.
- 527.220** Since no alteration or relocation of natural drainage ways is anticipated this section is not applicable.
- 527.230** Roads shall be maintained in manner that allows them to meet their design standards throughout their use.
- 527.240** If any of the roads on the disturbed area is damaged by a catastrophic event, the road will be repaired as soon as practical after the damage has occurred.
- 527.250** Steep cut slopes or requests for alternative specifications are not anticipated at this time therefore this section does not apply.

528. Handling and Disposal of Coal, Overburden, etc:

A narrative explaining the construction modifications, use, maintenance and removal of coal, overburden, excess spoil and coal mine waste.

- 528.100** Coal will be mined using continuous miners and longwall equipment. The coal will be transported from the face and deposited on the underground mine belts using shuttle cars or continuous haulage equipment. The coal will be transported by a series of conveyor belts from the section to the run of mine stockpile. The coal will be removed from the run of mine stockpile by a reclaim belt to an enclosed crusher/screen. Once crushed the coal will be conveyed to a storage bin from which it will loaded in to coal haul trucks for transportation to a unit train loadout.
- 528.200** Overburden: Lila Canyon is an underground operation and it is not anticipated that any material that overlays the coal seam, consolidated, or unconsolidated, other than topsoil, will be disturbed. Therefore, this section does not apply.
- 528.300** Spoil, coal processing waste, mine development waste, and noncoal waste removal, handling, storage, transportation, and disposal areas and structures are discussed below.

- 528.310** Excess Spoil: Since Lila Canyon is an underground operation it is not anticipated that any spoil will be generated. Therefore this section does not apply.
- 528.320** Coal Mine Waste: All underground development waste brought to the surface will be placed in the temporary rock pile and then blended back into the ROM product for sale. There will be no coal processing waste generated on the surface. Any oversized from the screens will be crushed and put back into the ROM stream. Portions of the rock slope material, not containing coal, will be used as structural fill for the shop/warehouse pad. The temporary mine development waste pile and slope rock disposal area are shown on Plate 5-2 and in Appendix 5-7.
- 528.321** Coal processing waste produced from the screen will not be returned to any abandoned underground workings. Any and all of the coal processing waste from the screen will be crushed and reintroduced into the ROM stream for sale.
- 528.322** Refuse Piles. Each pile will meet the requirements of MSHA, 30 CFR 77.214 and 30 CFR 77.215, meet the design criteria of R645-301-210, R645-301-512.230, R645-301-513.400, R645-301-514.200, R645-301-515.200, R645-301-528.320, R645-301-536 through R645-301-536.200, R645-301-536.500, R645-301-536.900, R645-301-542.730, R645-301-553.250, R645-301-746.100, R645-301-746.200, and any other applicable requirements.
- 528.323** Burning and Burned Waste Utilization.
- 528.323.1.** Coal mine waste fires will be extinguished by the person who conducts coal mining and reclamation operations, in accordance with a plan approved by the Division and MSHA. The plan will 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, will be involved in

the extinguishing operations. The coal mine waste fire plan can be found in Appendix 5-3. MSHA approval is not required unless you have an actively burning fire. (Phone conversation with Billy Owens MSHA Denver 5/31/05)

528.323.2. No burning or burned coal mine waste will be removed from the permitted disposal area.

528.330 Noncoal Mine Waste.

528.331 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 will be placed and stored in a controlled manner in a designated portion of the permit area. The noncoal mine waste will be placed in dumpsters and emptied on a as needed basis. The designated noncoal waste area is shown on Plate 5-2.

528.332 It is anticipated that final disposal of noncoal mine wastes will be at the ECDC facility near East Carbon City. Concrete will be disposed of in a specified area, refer to Plate 5-6 for this location. The disposal site will be located under the reclaimed coal stockpile. This area will receive the maximum fill during reclamation. Placement of this fill around the concrete will help to eliminate runoff. This will ensure that leachate and drainage does not degrade surface or underground water. The noncoal mine waste will be placed in dumpsters and emptied on a as needed basis.

528.333 The noncoal mine waste will be disposed of at the ECDC facility near East Carbon City.

528.334 Notwithstanding any other provision to the R645 Rules, any noncoal mine waste defined as "hazardous" under 3001 of the Resource Conservation and Recovery Act (RCRA) (Pub. L.

94-580, as amended) and 40 CFR Part 261 will be handled in accordance with the requirements of Subtitle C of RCRA and any implementing regulations.

528.340 A description of the disposal methods for placing underground waste and excess spoil generated at surface areas according to R645-301-211, R645-301-212, R645-301-412.300, R645-301-512.210, R645-301-512.220, R645-301-514.100, R645-301-528.310, R645-301-535.100 through R645-301-535.130, R645-301-535.300 through R645-301-535.500, R645-536.300, R645-301-536.600, R645-301-542.720, R645-301-553.240, R645-301-745.100, R645-301-745.300, and R645-301-745.400 is covered in sections 535, and 536.

528.350 A description of measures to be employed to ensure that all debris, acid-forming and toxic-forming materials, and materials constituting a fire hazard are disposed of in accordance with R645-301-528.330, R645-301-537.200, R645-301-542.740, R645-301-553.100 through R645-301-553.600, R645-301-553.900, and R645-301-747 is included.

528.400 Dams, embankments and other impoundments. See Section 700 and Appendix 7-4.

529. Management of Mine Openings:

The permit application includes a description of the measures to be used to seal or manage the openings within the proposed permit area. New slope or drift openings required to be sealed shall be sealed with solid, substantial, noncombustible material for a distance of at least 25 feet into such openings. The closure design for portals, slopes, and drifts, can be found in Appendix 5-6, [and Appendix 5-9](#).

529.100 Shafts or other exposed underground opening when no longer in use will be cased, lined, or otherwise managed as approved by the Division. All openings exposed by mining operations within the permit area will be permanently closed unless approved for water monitoring.

529.200 For the purposes of Underground Coal Mining and Reclamation Activities:

529.210 Mine entries which are temporarily inactive, but have a further projected useful service under the approved permit application, will 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 will be periodically inspected and maintained in good operating condition by the person who conducts the activity.

529.220 Since no portals are projected to return underground development waste, coal processing waste or water to the mine, this section does not apply. There is no current need to return any waste to the underground workings.

529.300 Section 529 does not apply to holes drilled and used for blasting.

529.400 No openings have been identified for use to return coal processing waste to underground workings. Therefore this section is not applicable.

530. Operational Design Criteria and Plans.

531. General plans for the sediment pond and refuse pile are found within this section.

532. Sediment control measures can be found in Chapter 7.

532.100 The smallest practicable area will be disturbed during the life of the project. Progressive backfilling, grading, and prompt revegetation of applicable will be completed as per R645-301-353.200.

532.200 Backfilled material will be stabilized to promote a reduction of the rate and volume of runoff in accordance with R645-301-537.200, R645-301-552 through R645-301-553.230, R645-301-553.260 through R645-301-553.420, R645-301-553.600, and R645-301-553.900.

533. Impoundments.

533.100 Since no impoundments meeting the criteria of 30 CFR

77.216(a) this section does not apply.

- 533.200** The only impoundment planned for this site is the sediment pond. The sediment pond is a temporary structure. A detailed design for the Sediment ponds can be found in Appendix 7-4, Section 3.1 and on Plate 7-6.
- 533.210** The sediment pond will be incised, except for the dam/road embankment. This embankment will be reconstructed and compacted to at least 95%. A detailed design for the Sediment ponds can be found in Appendix 7-4, Section 3.1 and on Plate 7-6.
- 533.220** Where fill is to be placed, natural ground shall be removed 12" below the structure. A detailed design for the Sediment ponds can be found in Appendix 7-4, Section 3.1 and on Plate 7-6.
- 533.300** Rip-rap or other protection (culverts, concrete) will be placed at all inlets and outlets to prevent scouring. A detailed design for the Sediment ponds can be found in Appendix 7-4, Section 3.1. Also see Plate 7-6.
- 533.400** External slopes of the impoundment will be planted with an approved seed mix to help prevent erosion and promote stability. A detailed design for the Sediment ponds can be found in Appendix 7-4, Section 3.1. A detailed design for the Sediment ponds can be found in Appendix 7-4, Section 3.1 and on Plate 7-6.
- 533.500** This section does not apply, there are no vertical highwalls associated with this impoundment.
- 533.600** Since no impoundments are planned that meet the criteria of MSHA, 30 CFR 77.216(a) this section does not apply.
- 533.700** Design and construction requirements, as well as operation and maintenance requirements are detailed in Appendix 7-4, Section 3.1.

534. Roads. The designs for surface roads can be found in Appendix 5-4.

- 534.100** The roads have been designed, located, constructed and will be maintained to:
- 534.110** The roads have been designed, located, constructed and will be maintained to prevent or control damage to public or private property.
 - 534.120** Nonacid or nontoxic-forming substances will be used in road surfacing.
 - 534.130** The designs for the roads can be found in Appendix 5-4.
 - 534.140** The reclamation plan for the roads can be found in section 542.600.
 - 534.150** The roads have been designed to prevent or control erosion, siltation and air pollution.
- 534.200** Appropriate limits for grade, width, and surface materials have been used in the design of the roads.
- 534.300** Primary Roads. Primary roads will meet the requirements of R645-301-358, R645-301-527.100, R645-301-527.230, R645-301-534.100, R645-301-534.200, R645-301-542.600, R645-301-542.600, and R645-301-762, any necessary design criteria established by the Division, and the following requirements. Primary roads will:
- 534.310** The roads will be located insofar as practical, on the most stable available surfaces.
 - 534.320** The roads will be surfaced with rock, crushed gravel, asphalt, or other 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;
 - 534.330** The roads will be routinely maintained to include repairs to the road surface, blading, filling potholes and adding replacement gravel or asphalt. It will also include revegetating, brush removal, and minor reconstruction of road segments as necessary.

534.340 Culverts if required will be designed, installed, and maintained to sustain the vertical soil pressure, the passive resistance of the foundation, and the weight of vehicles using the road.

535. Spoil: It is anticipated that no spoil will be produced at the Lila Canyon Mine therefore this section is not applicable.

536. Coal Mine Waste: The proposed Lila Canyon Mine could produce 2 separate types of coal mine waste:

1. Normal coal processing waste or refuse and;
2. Underground development waste (rock slope material).

All underground development waste brought to the surface will be placed in the temporary rock pile and then blended back into the ROM product for sale. There will be no coal processing waste generated on the surface. The rock slope material / underground development waste will be examined and tested as necessary to determine acid- or toxic-forming potential.

536.100 All underground development waste, other than the rock slope material, will be brought to the surface and will be placed in the temporary rock pile and then blended back into the ROM product for sale. There will be no coal processing waste generated on the surface.

536.110 The refuse pile will be designed to attain a minimum long-term slope stability safety factor of 1.5. See Appendix 5-7.

536.200 Underground development waste brought to the surface will be deposited according to the plan described in Appendix 5-7.

536.300 Since no spoil fills will be generated this section does not apply.

536.400 Since there will not be any impounding structures constructed of coal mine waste this section does not apply.

536.500 As discussed in Section 536 and 536.300, it is proposed to dispose of the rock slope material / underground development waste within the rock disposal area and be used as structural fill

as shown on Plate 5-2.

536.510 It is not anticipated that coal mine waste materials from activities located outside the permit area be disposed of in the permit area. Therefore this section does not apply.

536.520 It is not anticipated that coal mine waste will be brought to the surface then taken back underground for disposal therefore this section does not apply.

536.600 In areas where slope rock or coal processing waste is deposited, the topsoil will be removed and stored in the topsoil stockpile area until reclamation.

536.700 It is not anticipated that coal processing waste will be returned to abandoned underground workings therefore this section does not apply

536.800 Since no coal processing waste banks, dams, or embankments are planned for the Lila Canyon Mine therefore, this section does not apply.

536.900 Refuse Piles. (See Appendix 5-7) The refuse pile is designed to meet the requirements of R645-301-210, R645-301-512.230, R645-301-513.400, R645-301-514.200, R645-301-515.200, R645-301-528.322, R645-301-528.320, R645-301-536 through R645-301-536.200, R645-301-536.500, R645-301-536.900, R645-301-542.730, R645-301-553.250, R645-301-746.100 through R645-301-746.200, and the requirements of MSHA, 30 CFR 77.214 and 30 CFR 77.215.

537. Regraded Slopes.

537.100 Each application will contain a report of appropriate geotechnical analysis, where approval of the Division is required for alternative specifications or for steep cut slopes under R645-301-358, R645-301-512.250, R645-301-527.100, R645-301-527.230, R645-301-534.100, R645-301-534.200, R645-301-534.300, R645-301-542.600, R645-301-742.410, R645-301-742.420, R645-301-752.200, and R645-301-762.

540. Reclamation Plan. (See Appendix 5-8 for reclamation plan.)

541. General.

- 541.100.** The operator is committed to performing all reclamation as in accordance with R645 rules.
- 541.200.** N/A. The operator is not involved in surface mining activities.
- 541.300.** The operator is committed to the removal of all equipment facilities and structures upon cessation of mining activities.
- 541.400.** The operator will address all reclamation activities as referenced in Chapter 5 of this document.

542 Narratives, Maps and Plans.

- 542.100.** See Table 3-3 time table based on project reserves markets and life of mine.
- 542.200.** The perimeter of the disturbed area contains approximately 42.6 surface acres within the disturbed area but only 33.86 acres will be disturbed leaving 8.74 acres of undisturbed islands within the disturbed area. The following R645 regulations will give detailed description and reclamation procedures to address these areas of disturbance. The reclamation plan for the sediment pond and drainage control structures can be found in Appendix 7-4.

Topsoil amounts can be found in Section 232.100 and are calculated from Plate 203. Concrete amounts can be calculated from the text in Section 520. Coal Mine Waste volumes can be found in Appendix 5-7. Volumes were calculated using a Cad system.

- 542.300.** Included.
 - 542.310.** Included. (See Plates 5-6 & 7-7)
 - 542.320.** There will not be any surface facilities left post mining.

- 542.400.** Not applicable. No surface facilities will remain post bond liability period.
- 542.500.** A reclamation time table is included as Table 3-3.
- 542.600.** All roads within the disturbed area will be reclaimed immediately after they are no longer needed for mining and reclamation operations.
- 542.610.** The time table of reclamation activities will enable the roads to be removed concurrently with reclamation activities. So, no closures specific to traffic would be anticipated.
- 542.620.** All bridges and culverts will be removed concurrent with reclamation.
- 542.630.** All disturbed areas will be ripped and top soiled prior to revegetation activities in compliance with all applicable R645 regulations. (See Appendix 5-8)
- 542.640.** Road surfacing materials such as sand and gravel, which are not suitable for revegetation establishment will be buried on site and covered with a minimum of two feet of material that would support vegetation. Concrete will be disposed of in the designated area and covered with four feet of cover. Asphalt will be disposed of off site, either in a landfill or sent to a recycling facility.
- 542.700.** Final Abandonment of Mine Openings and Disposal Areas.
- 542.710.** Appendix 5-6 depicts a typical seal that will be constructed at all mine openings. [Appendix 5-9 describes work to be done at the Ventilation Breakouts.](#)
- 542.720.** No excess spoil is anticipated at this time.
- 542.730.** All underground development waste brought to the surface will be placed in the temporary rock pile and then blended back into the ROM product for sale. There will be no coal processing waste generated on the surface.

542.740. Disposal of Noncoal Mine Wastes.

542.741. All non coal waste will be temporarily stored on site in approved waste bins and commercially picked up and transported to an approved disposal site. Non Coal waste generated during reclamation (such as concrete structure, buried culverts, utility lines, septic systems etc.) will be buried in the refuse disposal area and covered with a minimum of four feet of fill.

542.742. No noncoal waste will be stored on site or disposed of on site during the life of the mine.

542.800. A detailed cost break down is included in Chapter 8. Appendix 8-1 relative to bonding.

550 Reclamation Design Criteria and Plans. Each permit application will include site specific plans that incorporate the following design criteria for reclamation activities.

551. All underground openings will be sealed as detailed in Appendix 5-6, and Appendix 5-9.

552. Permanent Features.

552.100. In course of reclamation, areas that have been recontoured and top soiled will be “pock-marked” creating small basins that will facilitate vegetation establishment as well as minimizing erosion.

552.200. No permanent impoundments will be left post reclamation.

553. The operator will comply with all regulations applicable to underground mining activities relative to backfilling and grading as required by R645 regulations.

Some minor cut slopes along the reclaimed road may be left after reclamation due to the difficulty and inability to reclaim all material pushed over the side while making the road cut. See plate 5-7B-2 cross section 16+00 for details. UEI will make reasonable efforts to minimize the cut slopes being left.

553.100. Disturbed Areas. Disturbed areas will be backfilled and graded to:

553.110 The operator will obtain a post mining topography similar in form as what existed premining.

553.120 Since Lila Canyon is an underground operation, no spoil piles will be created. Minor highwalls may be created with the development of the rock slope portals. Upon completion of mining these entries will be seal as per Closure for Mine Openings Appendix 5-6 and all highwalls will be eliminated during the reclamation phase of the operation. Plate 5-9 shows the proposed portal plan. During reclamation, suitable material 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.

553.130 All fill slope will have a static safety factor of 1.3 as shown in Appendix 5-5.

553.140 Erosion and water pollution will be minimized on site by the use of drainage control structures (burms, channels and silt fence) and the use of small depression, soil tackifiers, mulch and sediment pond design. No water is anticipated leaving the reclaimed site prior to adequate treatment in the form of retention and/or filtration that does not meet and/or exceed UPDES standards.

553.150 The post mining land use of wildlife and domestic grazing should be enhanced to some degree with the revegetation of a more desirable seed mix and

a vegetative cover in excess of what was present premining.

553.200 Spoil and Waste.

553.210 All underground development waste brought to the surface will be placed in the temporary rock pile and then blended back into the ROM product for sale. There will be no coal processing waste generated on the surface. Any oversized from the screens will be crushed and put back into the ROM stream.

553.220 Since no spoil will be produced this section does not apply.

553.221 All vegetation and /or organic material will be removed prior to any coal mine waste being stored.

553.222 All useable topsoil or topsoil substitute will be removed from the structural fill and refuse areas prior to use. Table 2-1 shows estimates of salvageable soil by soil type based on current NRCS soil inventories. The location of the soil storage are shown on Plate 5-2. This material will be spread over the recontoured structural fill and refuse areas prior to seeding and mulching.

553.223 Since no spoil will be produced this section does not apply.

553.230 All recontoured areas will be compacted to minimize slippage. The area will then be overlaid with topsoil and ripped. In addition the area will be "pock-marked" to minimize the potential for erosion as well as enhance revegetation establishment. It is not anticipated that soil will be disturbed in areas too steep for equipment to operate.

553.240 The structural fill area will have slopes of less than 8% upon final recontouring and revegetated to

enhance the post mining land use of grazing and wildlife habitat.

553.250 A need for a refuse pile at Lila Canyon is not anticipated.

553.260 The operator will commit to all applicable R645 regulations relative to disposal of coal processing waste.

553.300 All underground development waste brought to the surface will be placed in the temporary rock pile and then blended back into the ROM product for sale. There will be no coal processing waste generated on the surface. Any oversized from the screens will be crushed and put back into the ROM stream.

553.400 Cut-and-fill terraces may be allowed by the Division

553.410 No cut and fill terraces will be required.

553.420 No terraces will be required for post mining land use.

553.500-540 and 553.600-553.650.500

The only area that falls under these provisions are the reclaimed Horse Canyon mine which lies in the north west portion of the lease area and is addressed under approved MRP Act #0013 (Part "A").

553.700-553.900

This operation will only involve underground mining and as such the above referenced regulations do not apply.

560. Performance Standards. Coal mining and reclamation operations will be conducted in accordance with the approved permit and requirements of R645-301-510 through R645-301-553.

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Revised document: K:\Lila\2016\L16-001 Ventilation Breakout and Removal of Part A and B References\Deficiencies Task 5081\Chapter 7 Edits.wpd

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**Horse Canyon Extension
Lila Canyon Mine**

**Chapter 7
Hydrology
11-006**

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Chapter 7

700. HYDROLOGY

710. Introduction

711. General Requirements

- 711.100** The existing hydrologic resources of the proposed Lila Canyon Mine area are detailed under section 720.
- 711.200** The proposed operations and potential impacts to the hydrologic balance are described in Sections 728 and 730.
- 711.300** All methods and calculations utilized to achieve compliance with hydrologic design criteria and plans are described in Section 740 and Appendix 7-4.
- 711.400** Applicable performance standards
- 711.500** Reclamation hydrology is described in Section 760 and in Appendix 7-4.

712. All cross sections, maps and plans required by R645-301-722 as appropriate, and R645-301-731.700 have been prepared and certified according to R645-301-512.

713. Impoundments will be inspected as described under Section 514.300:

A professional engineer or specialist experienced in the construction of impoundments will inspect the impoundment.

Inspections will be made regularly during construction, upon completion of the construction, and at least yearly until removal of the structure or release of the performance bond.

The qualified, registered professional engineer will promptly, after each inspection, provide to the Division, a certified report that the impoundment has been constructed and maintained as designed and in accordance with the approved plan and the R645 Rules. The report will include discussion of

any appearances of instability, structural weakness or other hazardous conditions, 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. (See Appendix 5-2 for the inspection form).

A copy of the report will be retained at or near the mine site.

There are no impoundments at this site subject to MSHA, 30 CFR 77.216; therefore, weekly inspections are not required.

Impoundments not subject to MSHA, 30 CFR 77.216 will be examined at least quarterly by a qualified person designated by the operator for appearance of structural weakness and other hazardous conditions.

720. Environmental Description

721. General. The following information will present a description of the existing, pre-mining hydrologic resources within the proposed permit and adjacent areas. This information will be used to aid in determining if these areas will be affected or impacted by the proposed coal mining activities.

The proposed Lila Canyon Mine is located, in the southwestern portion of the Book Cliffs in Emery County, Utah, approximately 2 miles south of the old Horse Canyon Mine, formerly operated by Geneva Steel Company. The proposed mining will be in the Upper (and possibly Lower) Sunnyside Seam of the Blackhawk Formation.

Existing hydrologic resources of the area consist of: Surface water resources - intermittent by rule with ephemeral flow streams; and Groundwater resources - springs and seeps and perched, isolated aquifers. These resources have been evaluated using hydrologic data from the Horse Canyon Mine, water level piezometers, and seep/spring inventory data of the proposed mine and adjacent areas. Plates 7-1 and 7-1A show the locations of the surface drainages, springs and seeps, and piezometers.

722. Cross Sections and Maps

722.100 Subsurface Water. The locations where subsurface water, including springs and seeps, have been identified are presented on Plates 6-1 and 7-1 and data results are included in Appendix 7-1. Relevant cross sections of subsurface water, geology, and drill holes are shown on Plate 6-1. Where sufficient data are available, the seasonal head differences are presented on contour maps (see Figure 7-2A) and on a piezometer hydrograph plot (see Figure 7-2B).

722.200 Surface Water. Location of all streams and stockwatering ponds or tanks in the area of the mine are shown on Plate 7-1. There are no perennial streams, lakes or ponds known to exist within the proposed permit or adjacent areas.

A new diversion work was thought to have been constructed by the BLM in 2004 at the confluence of the Right Fork of Lila Canyon and Grassy Wash. Water from this diversion was directed to the stock pond located in Section 28, T. 16 S., R 14 E. Figure 1 in Appendix 7-9 shows the location of the diversion and the alignment of the diversion channel to the stock pond. Also, the location of the overflow channel back to Grassy Wash is also presented on the figure. However, the BLM was not involved in the pond improvements. Recent site investigation 2006 shows that the diversion structure described in Appendix 7-9 has been breached and no flow now reaches the pond from Grassy Wash. No other ditches or drains are known to have been constructed in the area of the mine.

722.300 Baseline Data Locations. Locations of all baseline data monitoring points are shown on Plate 7-1. Baseline water quality and quantity data is included in Appendix 7-1.

722.400 Water Wells. Three wells and three piezometers have been identified in the permit and adjacent areas. Two wells are located within the alluvium of lower Horse Canyon Creek. Three water piezometers were drilled in the area, IPA #1, IPA #2 and IPA #3, to monitor mine water levels. Drill hole S-32 was drilled and converted to a water monitoring hole by Kaiser in 1981. The details

of these wells and piezometers are discussed in Section 724.100 of the application. The location of all these wells and piezometers is shown on Plate 7-1. No information on any other wells has been identified.

722.500 Contour Maps Contour Maps of the proposed disturbed area and mining areas are included as Plates 5-2A, ~~5-2B~~, 7-1 and 7-2 and Appendix 5-9. These maps use U.S.G.S. based contours and accurately represent the proposed permit and adjacent areas. Disturbed area maps present greater detail from low-level aerial photography, for greater detail, and are tied to relevant U.S.G.S. elevations to ensure correlation between the maps.

723. Sampling and Analysis

All water quality analyses performed to meet the requirements of R645-301-723 through R645-301-724.300, R645-301-724.500, R645-301-725 through R645-301-731, and R645-301-731.210 through R645-301-731.223 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 performed to meet the requirements of R645-301-723 through R645-301-724.300, R645-301-724.500, R645-301-725 through R645-301-731, and R645-301-731.210 through R645-301-731.223 will be conducted according to either methodology listed above when feasible. “Standard Methods for the Examination of Water and Wastewater” is a joint publication of the American Water Works Association, and the Water Pollution Control Federation and is available from the American Public Health Association, 1015 Fifteenth Street, NW, Washington, D.C. 20036.

724. Baseline Information

This section presents a description of the groundwater and surface water hydrology, geology, and climatology resources to assist in determining the baseline hydrologic conditions which exist in the permit and adjacent areas. This information provides a basis to determine if mining operations can be expected to have a significant impact on the hydrologic balance of the area.

724.100 Ground Water Information. This section presents a discussion of baseline groundwater conditions in the permit and adjacent areas. The data set consists of piezometer, spring and seep inventory data, mine discharge, and mine inflow information from the abandoned Horse Canyon Mine. Appendices 7-1 and 7-6 provide data through the 2002 sampling period. All of these data and other recent data are available in the DOGM electronic database. The data, provided in Appendices 7-1 and 7-6 and the DOGM electronic data base, were obtained from multiple sources, including (but not limited to) on-site sampling efforts, the Horse Canyon Mine P.A.P. filed by

Geneva Steel and annual reports, U.S. Geological Survey publications, and various consultant reports. Since not all monitoring parties were required to adhere to UDOGM or SMCRA rules, the laboratory parameters varied between reports. However, the data are still considered valid and appropriate for determining baseline conditions within the permit and adjacent areas. The location of the sampling points are presented on Plates 7-1 and 7-1A.

History of Data Collection. The U.S. Geological Survey conducted a water quality study in Horse Canyon from August 1978 until September 1979 during the time that U.S. Steel operated the mine. Samples were taken monthly from the Horse Canyon Creek and analyzed for most major ions and cations and field parameters. Metals, eight nitrogen species and other minor chemical constituents were taken on a quarterly basis or less.

Between January 1981 and April 1983, baseline water quality data was collected for four surface water/spring sites B-1, HC-1, RF-1 and RS-2, and 3 UPDES Discharge Points, 001 (Mine Discharge), 002 (Mine Discharge) and 003 (Sewer Plant) , on the Horse Canyon permit area. Between 14 and 19 samples were taken and analyzed during the monitoring period depending on the site. The parameters that were analyzed were derived from Section 783.16 in the regulations. DOGM monitoring guidelines were not in force at that time.

Two other sites, RS-1, and RS-2, were sampled once a year during 1978, 1979, and 1980 and analyzed for most major chemical constituents. In addition, springs H-1, H-6, H-18, and H-21 were sampled once by JBR and analyzed for the major constituents in 1985. Third quarter data for 1989 were collected for B-1, HC-1, RF-1, and RS-2 and sampled for most of the parameters in DOGM's guidelines.

Sample sites B-1, HC-1, RF-1 and RS-2, along with the UPDES Discharge Points 001A and 001B, have been monitored quarterly since 1989 in accordance with the approved water monitoring plan for the Horse Canyon Mine (Part A). The results of this monitoring have been submitted to the Division each year with the Annual Report and or have been entered into the Divisions electronic data base.

Baseline monitoring was also conducted on the proposed Lila Canyon Mine extension area by Earthfax Engineering in 1993-1995. Some 60 sites were identified and monitored. This data is presented in Appendix 7-1.

The operational water monitoring program committed to the permit application was implemented in July, 2000. Data will be collected from new monitoring sites L-1-S through L-4-S. L-5-G has yet to be installed. These sites are typically dry and no quality data has been gathered as yet. Sites L-6-G through L-10-G have been monitored for baseline in 1993, 1994, and 1995. These sites, along with piezometers IPA-1, IPA-2 and IPA-3, were monitored in December 2000 to determine if they were still viable and to establish a current baseline that will be continuous with operational monitoring.

Sites L-11-G and L-12-G were added in October 2001 to replace sites L-6-G and L-10-G. Sites L-13-S, L-14-S, L-15-S, and L-18-S are being used to determine flow characteristics of the Williams Draw Wash, Wash below L-12-G, Little Park Wash, and Stinky Springs Wash.

Sites L-6-G, L-10-G and L-15-S were determined to either provide no flow data or data that was less representative than the replacement sites and will be suspended from sampling in the 1st quarter of 2003.

Wells. The wells in the mine area consist of two water supply wells, three water level piezometers, and an exploration borehole converted to a monitoring well.

Two wells are located within the alluvium of lower Horse Canyon Creek, near the Horse Canyon Mine. These wells area completed in the aerially small, alluvial aquifer at the mouth of Horse Canyon which contains groundwater likely collect from infiltration of surface flows from the upper Horse Canyon area. As indicated in Section 722.400, the well located near the main Horse Canyon surface facilities, identified as Horse Canyon well on Plate 7-1A, is still open, although not operational at this time. The well was investigated and it was determined that it would not be useful as a piezometer. The pump is sitting on the top of a concrete cap encapsulating the top of the well. The site could not be used as a piezometer without removing the pump. This well will be donated to the College of Eastern Utah as part of the Post Mine Land Use Change. The well located near the road junction, identified as MDC well on Plate 7-1A, is an abandoned well owned by Minerals Development Corporation. This well has been sealed to the operator's best knowledge. No hydrologic data is presently available from either of these wells.

Three water level piezometers were drilled as part of plans to access the Kaiser South Lease by I.P.A. These piezometers were designated IPA-1, IPA-2 and IPA-3, and are located in the Lila Canyon Permit area (see Plate 7-1). IPA monitored these sites for water depth from 7/94 to 4/96. These

monitoring results are included in Appendix 7-1 and monitoring points and measured water levels are shown on Plate 7-1. It should be noted that the monitoring of these holes was done over the 2 3/4 year period to provide baseline data for the South Lease by I.P.A. Monitoring of water depths at these points by UtahAmerican commenced in December 2000 and continued through present. As indicated by the data in Appendix 7-1, the water levels in the holes show very little fluctuation. Levels change from less than 1.2' to a maximum of 21.2' over an eight year monitoring period. Figure 7-2A and 7-2B present the seasonal fluctuations of the water levels as contour maps and hydrographs. Using these water levels, an estimate of the projected water level assuming that the zones from the individual piezometers are connected is shown on Plate 7-1 and the monitoring results are included in Appendix 7-1 - Baseline Monitoring.

The piezometers were installed to provide depth of water only. It is impossible to drop a bailer 1000 feet and withdraw a water sample without contaminating the sample. It has been suggested that sampling pumps be installed on these wells. Appendix 7-11 discusses the difficulties of using pumps and bailers in these piezometers. Due to limited pump capabilities in a 2-inch diameter well such sampling is not feasible. Therefore the depth and diameter of the piezometers holes make it impossible to use them for baseline quality sampling.

Drill holes S-26, S-27, S-28, and S-31 were cased in 3" PVC pipe with bottom perforations for water monitoring; however, cement seals were faulty, allowing the PVC pipe to fill with cement. Drill hole S-26 was reported dry in the week prior to cementing.

It has been reported by Kaiser that holes within one and one-quarter miles east of the cliff face were drilled with air, mist and foam and did not detect any water in the subsurface with the exception of drill hole S-32. No apparent increase in fluid level could be attributed to groundwater inflow from these holes, some of which were open for two weeks. Exploration drill holes in the South Lease property south of Williams Draw did not encounter groundwater within 1 to 1.25 miles of the coal outcrop. Exploration drill holes in the South Lease property, south of Williams Draw, did not encounter groundwater within 1 to 1.25 miles of the coal outcrop.

S-32 is located approximately three miles south of Lila Canyon and is separated from Lila by at least two known fault systems. The drill log along with the Chronology of Development and Pump tests are included in Appendix 6-1. Water levels measured are shown in the "Chronology of Development". Water quality analysis for S-32 is also included in Appendix

6-1. These water quality data are representative of the completion zone of the well (Upper Sunnyside Coal Seam and zone beneath the coal). The location of S-32 is shown on Plate 7-1. The Permittee visited S-32 in 2002 and attempted to measure water levels, but found that piezometer S-32 was unusable.

Spring and Seep Data. JBR Consultants Group (1986) conducted a spring and seep inventory of the Horse Canyon area during the fall of 1985. During the study, no springs or seeps were located within the disturbed area or near the proposed surface facilities. Within and adjacent to the permit area, 19 springs and seeps were found. Flows occurred from either sandstone beds located over shales or from alluvium. The flow rates from the springs varied from less than 1 gpm to about 10 gpm. Table 7-1 shows the flow rates and field data for each site. Sample results are listed in Appendix 7-6.

Based on the data, nine of the springs occurred from alluvial deposits in the stream channels or in colluvium. Nine of the remaining springs discharge from sandstone located above less permeable shale. Spring (H-92) was developed by excavating into bedrock. The discharge from this spring is through a pipe.

An additional spring and seep survey was conducted in the area, including the proposed Lila Canyon Mine area, by Earthfax Engineering in 1993 through 1995. Results of this survey are included in Appendix 7-1 of this permit. This is the most consistent and most recent data; therefore, this data has been used for baseline monitoring in Appendix 7-1.

All of the spring and seep sites identified from the various surveys are presented on Plate 7-1A. The geologic source for the springs can be determined by comparing Plates 6-1 and 7-1 and 7-1A. Additionally, the elevation of the sampling points can be estimated from the topographic base map. All groundwater use (seeps and springs) within the permit and adjacent areas is confined to wildlife and stock watering.

It should be noted that a number of sample sites and monitoring holes have been noted in previous submittals. Sites A-26 and A-31 were mentioned in the Horse Canyon Mine Plan; however, these sites were drilled in 1981, and no data is available as to location and/or water quality data. These sites are considered non-usable for this plan. Sites H-21A, H-21B, H-18A, H-18B, HC-1A and an unidentified spring 1000' southwest of HCSW-2 have been mentioned; however, no sample data or pertinent information is available for these sites, and they have been removed from Plates 7-1 and 7-1A. Plates 7-1 and 7-1A have therefore been revised to show only seep/spring and

other pertinent hydrologic data points for which adequate, reliable data is available for the plan.

Water rights for the mine and adjacent areas are addressed in Section 722.200 of this P.A.P.

Table 7-1 1985 Spring and Seep Survey Results							
Spring ID	Temp (C°)	pH	Conduct. (umhos.)	Flow (gpm)	Occurrence	Use	Sampled
H-1	7	8.1	950	2	SS over Shale	wildlife	yes
H-2	10	8.0	1111	2	Colluvium	wildlife	no
H-3	-	-	-	<<1	Alluvium	wildlife	no
H-4	9	7.7	1229	1	Colluvium	wildlife	no
H-5	10.5	7.7	1359	1	Alluvium	wildlife	no
H-6	9	7.9	1366	10	SS over Shale	cattle	yes
H-7	9.5	7.6	1985	<1	SS	cattle	no
H-8	12	7.8	1997	<1	SS	wildlife	no
H-9	11	7.7	1919	2	Alluvial	cattle	no
H-10	11	7.9	2150	1	Alluvial	cattle	no
H-11	9.5	7.8	1227	2.5	Alluvium	cattle	no
H-13	11	7.1	1596	4.5	Colluvium	cattle	no
H-14	7	7.5	2040	2	SS over Shale	cattle	no
H-18	7	7.9	1381	9	Alluvium	wildlife	yes
H-19	8	8.2	645	3.5	SS over Shale	developed	no
H-20	14	8.3	777	2.5	SS over Shale	none	no
H-21	14	8.3	968	6	SS over Shale	wildlife	yes
H-22	5	8.3	322	1	SS over Shale	none	no
H-92	-	-	-	<<<1	SS over Shale	none	no

Mine Inflow Information. Based on the historic record, water was encountered underground in the Horse Canyon Mine, resulting in outflows from portal areas of approximately 0.2 cfs or 90 gpm. The size of the flows from pumping or from old portal discharges is more the result of the large size of the mine (approx. 1500 ac), rather than the result of intercepting a localized high flowing aquifer. If the flow is distributed over the mine area, the average inflow is about 0.6 gpm per acre. The water encountered was likely discharge from perched aquifers or saturated sandstone lenses encountered during mining, not uncommon in mines in the Blackhawk Formation.

According to mining records of U.S. Steel (previous owner), groundwater was monitored within the Horse Canyon mine in several locations. Generally, the underground flows occurred from roof drips or areas where entries encountered sandstone lenses. As discussed in the Blackhawk Formation description, the inflows were similar to inflows found in other mines along the Book Cliffs. This is thought to represent an interception of an isolated saturated zone in the subsurface. Generally, a saturated, perched sandstone lense which overlies the coal seam is intersected by the mining operation. This provides a flow path for the isolated water in the sandstone lense to drain into the mine. Over time as the volume of water in the sandstone lense decreases, the rate of discharge also decreases. Eventually, the inflow ceases as the available water in the lense is fully drained. This drying up of the inflow is indicative of a very limited recharge to the deep strata in area, which is consistent with the known horizontal and vertical hydraulic conductivity of the Blackhawk Formation.

Flows which issued from rock slopes and gob areas, where roof collapse may have occurred, were also small. These area would have exposed numerous points for inflow from sand stone lenses, roof bolts, and fractures within the formation. Therefore, it would be likely that if there were large amounts of water stored within the formation, the inflows from these area would have been significantly greater. The lack of these flows from these areas of the mine are a further indication that limited water was stored in the formation and that the recharge to the formation from overlying strata was also limited.

During the period from 1957 to 1962, an exploration test entry was mined south from the Geneva Mine into the Lila Canyon Area. This entry encountered in-place water, which was allowed to collect in short cuts made into the down dip entry which was sufficient to keep excess water from working areas. The exploration entry was terminated when the Entry fault was encountered (see Plate 7-1). More than two months was spent drilling to ascertain the nature of the fault and locate the coal seam. During this

period, there is no mention in the records of excess water or that water was encountered in the Entry fault area.

There is no estimate of water quality retrieved while mining the exploration entry other than mentioned above. However, water flow and seeps were reported to be in the range of 1 to 24gpm.

Only when the mine neared the Sunnyside Fault was significant water encountered. The water was initially pumped for use in the water supply system for the mine. When inflows increased beyond in-mine needs, to keep the workings near the Sunnyside Fault from flooding, the mine pumped water collected from this area from the workings during the period 1980 through 1983, prior to suspending operations. The development plan for the mining within the Lila Canyon extension is planned to avoid the Sunnyside Fault. Therefore, the amount of water to be encountered underground will be limited.

The rate of inflow into the Horse Canyon Mine is not precisely known. In U.S. Steel's Permit Application Package (PAP) (1983) they estimated the average discharge from the mine to be 0.2 cfs. Lines and Plantz (1981, p. 32) also estimated the discharge from the mine to be 0.2 cfs and mentioned that the discharge was intermittent. It is not known, however, if this represents a constant average flow or the average flow rate during discharge periods. The mine was using an unknown volume of water within the mine for dust suppression and other operational needs.

According to the I.P.A. Mining and Reclamation Plan for Horse Canyon, Kaiser Coal re-entered the mine in 1986. They found that at the intersection of the Main Slope and 3rd level, at the rotary car dump, there was water in the bottom of the dump. The water level in the dump was described in the Horse Canyon P.A.P. as being "about 30 feet below the floor (personnel communication, 1990)". U.S. Steel monitoring site 2 Dip, a sump where water collected, is very near this location and has an elevation of 5,827 feet. Therefore, the water level in the rotary dump would be at a level of about 5,800 feet. No other water levels were obtained during 1986.

In 1993, BXG also re-entered the Horse Canyon Mine. They reported water levels at the rotary car dump at approximately 5870. It is not known if this reported level was for the same locations, but it is assumed to be the close to the same location. Due to the extended period without pumping, this water level is probably representative of the level of water collected in the rest of the mine. Therefore, to be conservative, it is assumed that the Geneva exploration entries driven south from the Horse Canyon Mine into the

proposed Lila Canyon mining area do contain water since the tunnels elevation is approximately 5855 feet.

The Horse Canyon Mine has been closed and the surface area reclaimed. With no significant inflow to the old workings, no discharges are occurring from any of the portal areas nor are expected in the future. It is known however, that water has collected in the old entries. As future mining activities, for the proposed Lila Canyon Mine, will be occurring near this area of collected water in the old exploration entry workings, it is likely that some of this water will be intercepted by the proposed Lila Canyon Mine (see Plate 7-1). Water may then have to be pumped from the mine. Because of undulating floor and unknown void areas, it is impossible to determine the amount of water that would be pumped. The rate of pumping, if any, would be determined by the water discharge system design. All water discharged from the mine would be discharged at UPDES Site # 002A which is Site L-5-G, and will meet all UPDES standards. DOGM has specified planning to include a mine discharge of 500 gpm maximum.

An inspection of the Horse Canyon area following mining has shown no diminution of reasonably foreseeable use of aquifers. Since mining ceased in 1983, subsidence should have occurred within two years. However, no deterioration of the aquifers in the area was identified. Mining has not yet begun on the Lila Canyon site; however, since the structure and groundwater regime is similar to the Horse Canyon area, no diminution or deterioration of groundwater resources is expected in this area.

As the mining in the Lila Canyon Mine will be from the same seam and the adjacent strata are the same and the over and underburden are the same, occurrences of ground water in the Lila Canyon Mine are expected to be similar to the Geneva Mine (Horse Canyon). The water quality is expected to be the same as the water encounter in the Horse Canyon Mine. Samples taken underground from the Horse Canyon Mine (MRP part "A" Appendix VI-1) to the north of the Lila Canyon Mine and from well S-32 (MRP part "B" Appendix 7-1) by Kaiser to the south of the Lila Canyon Mine show the water from the level of the coal seam to be a calcium, sodium-sulfate type water. Therefore, it is likely that the water from the strata between these two points from the same strata will be very similar.

Inflows of water encountered while mining are expected to reduce to seeps or dry up in a short period of time. If a significant water inflow is encountered, the water, which is not needed for underground operations, will be collected, treated as necessary, and pumped to the surface for discharge under the terms of the UPDES permit.

Groundwater Systems. In the Lila Canyon Lease area, the groundwater regime consists of two separate and distinct multilayered zones. The upper zone consists of the Wasatch Group which includes of the Colton Formation, the undifferentiated Flagstaff Limestone-North Horn Formation, and the Price River Formation. These formations contain groundwater in isolate, perched aquifers. These perched zones are classified as aquifers because they supply groundwater in sufficient quantities for a specific use (as specified by R645-100-200). The lower zone consists of the Blackhawk Formation (where the coal seams are located). This formation consist of low-permeable strata which contain groundwater in isolated saturated zones. Based on the definition in the State coal mine regulations (R645-100-200), there is no aquifer in the lower saturated zone, because the water is not developed for a specific use nor does the strata transmit sufficient water to supply water sources. Additionally, there is no discharge from this zone along any fault or fracture or in any adjacent canyons. The two zones are separated by the Castlegate Sandstone. This zone is a porous, fairly clean sandstone. According to Fisher, et.al. (1960), the Castlegate Sandstone does not have any shales, clays, siltstones, or mudstones. The lower zone is underlain by the Mancos Shale, a very impermeable marine shale.

Geologic conditions in the permit and adjacent areas are described in detail in Chapter 6 of this P.A.P. Though discussed in several publications for the general Book Cliffs area, formal aquifer names have not been applied to any groundwater system in the permit and adjacent areas because the geometry, continuity, boundary conditions, and flow paths of the groundwater systems in the area differ somewhat from the general published discussions. However, the data do suggest that groundwater systems in each of the bedrock groups are sufficiently different from each other to justify the informal designation of groundwater systems based on bedrock lithology. Thus, the informal designation of the Upper zone - Colton, Flagstaff/North Horn, and Price River and the Lower zone - Castlegate, Blackhawk, and Mancos groundwater systems is adopted herein.

The majority of groundwater in the permit and adjacent areas generally occurs within isolated, perched aquifers in the upper zone overlying the coal-bearing Blackhawk Formation. In the lower zone groundwater occurs in isolated saturated zones in the Blackhawk Formation. Hydrogeologic conditions within the permit and adjacent areas are summarized below:

Upper Groundwater Zone

Colton Formation. The Colton Formation outcrops in the northeast portion of the permit and adjacent areas. This formation consists predominantly of fine-grained calcareous sandstone with occasional basal beds of conglomerates and interbeds of mudstone and siltstone. Data presented in

Plates 7-1 and 7-1A and Appendices 7-1 and 7-6 indicate that 16 springs issue from the Colton Formation within the permit and adjacent areas. The elevations and location of these springs vary greatly within the formation, indicating that the springs are isolated from each other and that they are not part of one aquifer.

Waddell et al. (1986) evaluated the discharge of springs in the formation for the period of June to September 1980. The measured discharge rate generally declined during the 4-month period of evaluation. This suggests that the groundwater system has a good hydraulic connection with surface recharge and that most of the annual recharge quickly drains out of the system. The limited flow indicates that the recharge is limited to small areas above the spring and not to a deeper groundwater system.

Groundwater issuing from the Colton Formation has a total dissolved solids ("TDS") concentration of 300 to 600 mg/l (as measured by specific conductance and laboratory analyses of TDS). The pH of this water is slightly alkaline (7.5 to 8.1). Insufficient data are available to describe seasonal variations in these parameters.

The water is a calcium-magnesium-bicarbonate type (see Appendix 7-1). The data also indicated total iron concentrations of <0.04 to 4.89 mg/l. Total manganese concentrations ranged from <0.01 to 1.29 mg/l.

Undifferentiated Flagstaff-North Horn Formation. The Flagstaff-North Horn Formation outcrops across much of the northern and central portion of the permit area. This formation consists of an interbedded sequence of sandstone, mudstone, marlstone, and limestone. Most springs and a major portion of the volume of groundwater discharging from the permit and adjacent areas issue from the Flagstaff-North Horn Formation. According to Plates 7-1 and 7-1A and Appendices 7-1 and 7-6, 36 springs issue from the Flagstaff-North Horn Formation within the permit and adjacent areas.

Groundwater discharge rates for springs issuing from the Flagstaff-North Horn Formation are greatly influenced by seasonal variations in precipitation and snowmelt, with most discharge corresponding to the melting of the winter snow pack during the spring months. Discharge is highest following the spring snowmelt and decreases to a trickle by the fall (Appendices 7-1 and 7-6). Many springs issuing from the Flagstaff-North Horn Formation have been noted to dry up each year.

Waddell et al. (1986), found that most of the annual recharge to the Flagstaff-North Horn Formation drains out of the system within about two months,

while the remainder of the annual recharge drains out prior to the next snowmelt recharge event.

The groundwater regime in the Flagstaff-North Horn Formation appears to be influenced predominantly by the combined effects of lithology and topographic expression. Because the Flagstaff-North Horn Formation forms the upland plateau of the permit and adjacent areas, this formation is capable of receiving appreciable groundwater recharge from precipitation and snowmelt.

Waddell et al. (1986) concluded that the Flagstaff-North Horn groundwater system consists of isolated, perched water bearing lenses rather than a continuous perched aquifer. They indicate that approximately 9 percent of the average annual precipitation recharges the Flagstaff-North Horn groundwater system and that recharge water entering the Flagstaff-North Horn Formation moves downward until it encounters low permeability lenses of shale or claystone layers in the lower portion of the formation, where almost all of the water is forced to flow horizontally to springs.

Data presented in Appendices 7-1 and 7-6 indicate that groundwater issuing from the Flagstaff-North Horn Formation has a TDS concentration range of 400 to 700 mg/l. This water tends to be slightly alkaline and, similar to conditions encountered in the overlying Colton Formation, is of the calcium-magnesium-bicarbonate type.

The data presented in Appendices 7-1 and 7-6 indicate that the total iron concentration of groundwater discharging from springs in the Flagstaff-North Horn Formation is generally less than 0.04 to 0.15 mg/l. Total manganese concentrations in Flagstaff-North Horn groundwater are generally less than 0.03 mg/l. These data do not exhibit seasonal trends.

Price River Formation. The Price River Formation consists of interbedded mudstone and siltstone with some fine-grained sandstone and carbonaceous mudstone. Within the permit area, 17 springs have been found issuing from the Price River Formation as indicated based on data presented in Plates 7-1 and 7-1A and Appendices 7-1 and 7-6. Flows from these springs are limited in quantity and generally show a seasonal decrease with time, being high in the spring and reduce to very low or dry conditions in the summer. Such fluctuations indicate that these springs originate from limited recharge areas. Therefore, these springs are also part of a series of isolated, perched saturated zones or lenses and not part a regional aquifer system. Transmissivity in the Price River Formation is estimated by Waddell (1986) to be 0.07 ft²/day or 0.00013 ft/day. Based on specific conductance

measurements collected from these springs, the TDS concentration of water issuing from the Price River Formation varies from about 750 to 850 mg/l. The water is slightly alkaline, with a pH of 7.9 to 8.9.

Lower Zone

Castlegate Sandstone. The Castlegate Sandstone consists of a fine- to medium-grained sandstone that is cemented with clay and calcium carbonate. The outcrops of this sandstone form prominent cliffs in the area. No springs were identified in this formation, suggesting that it is not a significant aquifer. The absence of springs is of great significance, since this formation is situated between the overlying Upper groundwater zone (in the Colton, Flagstaff/North Horn, and Price River Formations) and the underlying lower zone (in the Blackhawk Formation). This lack of springs indicates that there is separation between the upper and lower groundwater zones. Most likely this zone is the result of two factors: 1) clay horizons in overlying formations inhibit vertical recharge from groundwaters in the Flagstaff-North Horn Formations, and 2) the exposed recharge area of the Castlegate Sandstone is limited primarily to areas of steep cliff faces.

Blackhawk Formation. The Blackhawk Formation underlies the Castlegate Sandstone and consists of interbedded sandstone, siltstone, shale, and coal. The lower Sunnyside coal seam, to be mined by UtahAmerican, is located in the upper portion of the Blackhawk Formation.

Across the formation, with the exception of the Sunnyside Sandstone, most of the individual sandstone bodies are discontinuous. This results in areas that are saturated; i.e. sandstone lenses; and areas that are dry; i.e. siltstone and shale sections. This discontinuous nature results in the typical pattern found in the mines of the Wasatch Plateau and the Book Cliffs. For this upper portion of the Blackhawk Formation, no regional aquifer has been identified. As mining advances an isolated area of saturation (perched aquifer) is encountered by the entry or by roof bolting or fractures due to subsidence. As the water from these isolated saturated zone drains into the mine it starts at an initially high rate and over time as the limited extent of the zone is emptied, the rate of flow decreases. Some zones which are laterally connected are able to reach a consistent inflow which is a balance for the recharge to the system with the outflow to the mine entry.

The hydraulic conductivity of the lower zone is believed to be about 0.01 to 0.02 ft/day, similar to values reported by Lines (1985) from the Wasatch Plateau for similar lithologies. Structural dip in the Lila Canyon area is about 6 to 7 degrees to the east. The gradient of the lower zone in the Horse Canyon/Lila Canyon area is probably less than 2 degrees.

The IPA water level piezometers (Plate 7-1) were completed within the first formation with identifiable water below the coal seam, the Sunnyside Sandstone of the Blackhawk Formation. EarthFax Engineering supervised the drilling of the monitoring bore holes for IPA. In all three piezometers, immediately below the coal seam, a mudstone layer was encountered. Above the mudstone layer no significant water had been identified. Below the mudstone layer, a sharp transition to a sandstone layer was encountered. This sandstone layer was identified as the Sunnyside Sandstone. Water was identified as occurring from the sandstone layer in each of the piezometers. According to the EarthFax completion logs, the screened zones in the piezometers were located within the Sunnyside Sandstone layer and a cement-bentonite seal was placed from the top of the sandstone layer to the ground surface of the piezometer. Thus, the water level measured in the piezometers is indicative of the conditions found within the sandstone layer.

Data collected from the piezometers (Appendix 7-1) indicate that the water in the sandstone is under pressure. In IPA 1, the water level is approximately 590 feet above the completion zone. In IPA 2, the water level is about 810 feet above the screened level. While, IPA 3 has a water level approximately 250 feet above the completion level.

Additionally, water levels in IPA 2 and 3 varied by approximately 2 feet during the period of July 1994 through April 1996, but showed no consistent trend. IPA 1 showed a rise of 5.6 feet over the same period. Measurements collected in 2001 indicated that the water levels in IPA 2 and 3 were 1 to 2 feet higher than the last time it was measured nearly 5 years earlier, while IPA 1 showed a rise of 16 feet. For the period since 2001, no trend has been identified for IPA 2 and 3, while IPA 1 has continued a slow increase. Although an increase in water levels has occurred during the period of record, this increase is not considered significant.

As the piezometers are completed in the same saturated zone, the piezometric surface shows that groundwater in the Sunnyside Sandstone to be moving to the northeast, into the Book Cliffs (see Plate 7-1). The gradient of the piezometric surface is approximately 0.011 ft/ft. The seasonal fluctuations between fall and spring are almost undistinguishable. Based on the tabulated data (Appendix 7-1), the fluctuation range is less than 0.5 feet between summer and fall readings. Figures 7-1 and 7-2 attempt to show these variations in contour map and piezometer hydrographs.

The water level piezometers show water levels above the lower zone containing the coal seam in area of the mine. However, as reported in the Castlegate Sandstone section, no springs or water bearing zones were

identified in the spring and seep inventories or in the drilling of the water level piezometers in the formation. Therefore, indicating that the piezometer monitored zones are under pressure and that the water identified in the upper zone is perched and isolated from the lower groundwater zone.

While the water in the Sunnyside Sandstone is under pressure, there was no indication during drilling that the coal seam was saturated. Similar conditions have been identified in other mines in the Wasatch Plateau and the Book Cliffs. It is likely that the water within the Sunnyside Sandstone will not affect mining unless the confining mudstone layer is breached.

It is possible that mining will intercept some water as it progresses down dip. However, as discussed previously regarding mine water inflows to the Horse Canyon Mine, it is expected that water quantities and quality will be similar to that encountered in the Horse Canyon Mine. While some pumping is likely for water from the isolated saturated zones within the lower groundwater zone; since the water in the upper groundwater zone appears to be perched aquifers 200 to 500 feet above the coal seams, no adverse effects on usable surface sources are expected.

No springs have been identified as issuing from the Blackhawk Formation (see Appendices 7-1 and 7-6 and Plates 7-1 and 7-1A).

The quality of groundwater in the Blackhawk Formation is characterized by the water quality of data collected from inflows to the Horse Canyon Mine, which is completed in the lower portion of the Blackhawk Formation. Both mines will be completed in the same coal zone. Therefore, the quality of the water encountered in the Lila Expansion is expected to be similar to the water encountered in the Horse Canyon Mine. These data indicate that Blackhawk Formation groundwater has a mean TDS concentration range of 1400 to 2400 mg/l and is of the calcium, sodium-sulfate type. These waters are chemically distinct from groundwater in overlying groundwater systems.

Quality and quantity of underground water is the most difficult to ascertain due to geologic variables such as faults, fractures, channel sands and isolation of these particular features when water is encountered in order to gain reliable samples. Underground water tends to be co-mingled with water from other places in the mine and water pumped through the mines for mine equipment and dust suppression. Thus, care needs to be taken to obtain representative samples. Specific undisturbed water samples of the subsurface inflows are not known to have been collected. However, the quality results reported in the Horse Canyon records are consistent with in-mine samples from adjacent mines.

The dissolved iron concentration of groundwater flowing into the Horse Canyon Mine has historically been less than 0.5 mg/l and is generally less than 0.1 mg/l (see Appendices 7-1 and 7-6). The total iron concentration of this water has historically been less than 0.7 mg/l and generally less than 0.1 mg/l. The total manganese concentration of Blackhawk Formation water (as measured in the Horse Canyon Mine) has historically been less than 0.05 mg/l and is typically less than 0.03 mg/l (see Appendices 7-1 and 7-6).

Mancos Shale. The Mancos Shale is exposed south and west of the permit area. This formation is a relatively impermeable marine shale and is not considered to be a regional or local aquifer. Groundwater samples collected from two monitoring sites located in Stinky Spring Canyon approximately 2 miles southeast of Lila Canyon Mine have a TDS concentration in the range of 2200 to 4200 mg/l and are of the sodium-sulfate-chloride type (Appendix 7-1). The flow rate for these two springs is less than 1 gpm, indicating the impermeable nature of the source formation. In the 1981 baseline study for the Kaiser Steel south lease permit document, Kaiser indicated that no springs were identified below the coal seam along the face of the Book Cliffs. Therefore, at that time, these springs were not flowing. Total iron concentrations ranged from 0.35 to 11.8 mg/l. Total manganese concentrations ranged from 0.05 to 0.29 mg/l. Chemical compositions of other parameters are consistent with waters from the Mancos Shale in the Book Cliffs area. The change in water type, from sodium-bicarbonate in the overlying Blackhawk Formation to sodium-sulfate-chloride in the Mancos, and the increased iron and manganese concentrations indicate that the Big and Little Stink spring waters are not from the same source, but are isolated waters from different recharge sources.

The two springs, which are located stratigraphically near the top of the Mancos Shale, appear to be fault related. As shown on Plate 7-1a, there is an east-west trending fault zone that is located within the canyon where Big and Little Stink Springs are located, referred to as the Central Graben. These two springs are located on the southern side of the northern fault of the graben. Due to the isolated nature of this graben block, being down dropped relative to the surrounding strata, within the highly impermeable Mancos Shale, it is unlikely that these springs are connected to any other water sources within the permit area. Further, the water quality and flow of the these springs, as discussed above, also indicate an isolated nature of the waters. Based on these results, the waters from Big and Little Stinky Springs are considered are from a localized, isolated saturated zone, but not part of a regional aquifer or an extensive saturated zone.

Recharge and Discharge Relations

Recharge in the permit and adjacent areas occurs from precipitation to the exposed strata. Plate 7-1a shows the major zone of recharge. This recharge

area corresponds to the outcrop and exposure of the Colton/Flagstaff-North Horn Formations. No perennial surface water streams or surface water bodies exist within the permit or adjacent areas which contribute water to the groundwater systems. The majority of infiltration is a near surface occurrence into the alluvial fills within the drainages. The deeper sediments underlying the drainages (Blackhawk and Mancos) consist of low transmissivity strata which would prohibit the vertical movement of groundwater.

Recharge rates were calculated by Waddell and others (1986, p. 43) for an area in the Book Cliffs. Waddell estimated recharge at about 9 percent of annual precipitation. Lines and others (1984) indicate the mean annual precipitation along the Book Cliffs in the area of the Horse Canyon Mines is about 12 inches, indicating a recharge rate of just over 1 inch per year.

The recharge and discharge areas for local isolated, perched aquifers in the upper zone (Colton, Flagstaff-North Horn and Price River Formations) generally lie within the drainage areas of Horse and Lila Canyons. These local systems are complex in that they are discontinuous and lenticular in nature and highly dependent on topography. Recharge water from precipitation or snowmelt enters the Colton or Flagstaff-North Horn Formations and moves downward until it encounters low permeability shale or claystone layers or lenses in the formations, where almost all of the water is forced to flow horizontally to springs. The springs exhibit substantial variability in discharge in response both to spring snowmelt events and to drought and wet years. Discharge rates as great as 20 gpm have been recorded from the springs during the high-flow season, and discharge rates as low as 1 gpm are not uncommon during late summer. The effects of the drought occurring in the late 1980s and early 1990s are clearly evident in the flow records.

Recharge to the lower zone including the Castlegate Sandstone, Blackhawk Formation, and Mancos Shale is of limited magnitude, due to the limited area of exposure of the formations to steep outcrops and the presence of low-permeability units in overlying North Horn and Price River Formations. Additionally, the clay layers in the upper Blackhawk, which contain approximately 80 percent clays, siltstones, mudstones, and shales, are all highly restrictive to vertical groundwater movement (Fisher and others, 1960). Further, no surface water bodies are present to act as supply sources to the deep ground water system.

Recharge to the lower zone probably occurs primarily from vertical movement of water through the overlying formations and is probably greatest where surface fractures intersect the topographic highs where the upper zone formations outcrop. The rate of recharge to the lower zone is very slow.

The lack of a significant recharge source results in limited discharge areas. The largest portion of recharge to the lower zone is in the Castlegate Sandstone and upper member of the Blackhawk Formation with some leakage from the upper zone where the greatest number of springs are identified.

The Sunnyside fault zone is the major feature throughout much of the Sunnyside Mining District. Having a north-northwest strike, the fault zone extends from West Ridge to the Horse Canyon Mine. South of the Horse Canyon Mine the faults are not mapped at the surface. South of Horse Canyon, the faults are believed to be east of the Lila Canyon extension.

At the south end of the Lila Canyon Extension, a series of east-west trending faults have been mapped. These faults form the structure known as the Central Graben. The graben is a down dropped block relative to the adjacent strata.

Faults may effect flow, direction and magnitude of both lateral and vertical flows. However, the area is abundant with plastic or swelling clays that can seal faults and fractures inhibiting both lateral and vertical flows. As discussed in the mine inflow section, significant groundwater was only encountered in the Horse Canyon Mine as mining approached the Sunnyside fault zone. To prevent such inflows at the Lila Canyon extension, the mining plan attempts to avoid the fault zone. Also, exploratory mining by U.S. Steel, during the period 1952 to 1960, encountered the east-west trending Entry fault in the proposed Lila Canyon area. After extensive exploration, no significant water was encountered from the east-west trending fault.

Assuming mass-balance and stable hydrologic conditions, recharge will equal discharge over the long term. The relatively rapid groundwater discharge from the upper zone formations as compared with the underlying lower zone formations suggest that the stratigraphically-higher water discharges are local and are not hydraulically connected with the lower zone. Waddell et al. (1986) conclude that the perched nature of the upper zone formations protect them from the influence of dewatering of the coal-bearing zone unless the upper zone is influenced by subsidence.

Groundwater resources in the permit area are limited due to the small surface area and low recharge rates. There is not enough base flow from groundwater discharge to maintain a perennial flow in Horse Canyon Creek or Lila Canyon.

The upper groundwater zone produces low volume spring flows from up-dip exposures of bedrock and overlying alluvium. Some spring discharges from this zone have been developed and are used for livestock and wildlife. The lower groundwater zone has very limited discharges that are used for wildlife, generally during the early spring. Based on the location of these lower zone points and the vertical separation (500 feet) between the coal seam and the points, there is no possibility of mining impacting the springs.

Due to the lenticular, discontinuous, and vertically separated water bearing zones in the upper zone, it is not possible to develop a potentiometric surface or to show water level variations within these discontinuous aquifers. As described above, the nature of the discharge from the springs with time has been identified. Also, it is not possible, due to the discontinuous nature, to map the extent of the upper water bearing zones.

724.200 Regional Surface Water Resources. The permit area exists entirely within the Horse Canyon, Lila Canyon, and Little Park Wash watersheds. The regional drainage patterns are generally north-south with steep canyons which are incised in the Book Cliffs escarpment. Stream flows within the region, generally, are the result of snowmelt runoff or summer thunderstorms. Water is not abundant as evapotranspiration exceeds precipitation.

Permit Area Surface Water Resources

Within the permit area, the surface water resources consist of three main drainages: Horse Canyon Creek, Little Park Wash, and Lila Canyon. 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 flows southwest to Grassy Wash, then south to the Marsh Flat Wash and the Price River (see Plate 7-1).

Surface water sampling data are available in Appendix 7-2 and in the DOGM electronic database. The data were obtained from multiple sources, including (but not limited to) on-site sampling efforts, the Horse Canyon Mine P.A.P. filed by Geneva Steel and annual reports, U.S. Geological Survey publications, and various consultant reports. Since not all monitoring parties were required to adhere to UDOGM or SMCRA rules, the laboratory parameters varied between reports. However, the data are still considered valid and appropriate for determining baseline conditions within the permit and adjacent areas. The location of the sampling points are presented on Plates 7-1 and 7-1A.

Based on field observations (described in Appendix 7-7) and flow data obtained during the collection of water-quality samples within the permit and adjacent areas, Horse Canyon Creek is considered intermittent by rule with ephemeral flow within the permit area. Lila Canyon and Little Park Wash, based on the size of the drainage area (greater than 1 sq. mi.), are defined by regulation as intermittent but have been shown to be intermittent by rule with ephemeral flow (see Appendix 7-7). Several smaller tributaries of these streams within the permit and adjacent areas are ephemeral by flow pattern and by rule.

Horse Canyon, Little Park and Lila Canyon flow during the spring snowmelt runoff period and also 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. Flows in Horse Canyon, generally, are limited to the early spring period (Lines and Plantz, 1981). By mid to late spring, usually no flow is evident in Horse Canyon Creek, below the minesite or Lila Canyon.

Over the period of record, 1981 through present, there have been both wet and dry periods. From 1983 through 1984, the area had high precipitation. In the late 1990's through the present, a drought has been evident in the area. Over this period of record, the flows in the streams have increased and decreased based on the available water. Also, during both of these periods, flows in Horse Canyon Creek during the summer and fall are generally not evident below the mine site. Only flows from summer thunderstorms upstream of the site have resulted in flows below the mine. This indicates that while surface water resources may fluctuate, the fluctuations are not great enough to change the response of the stream to overcome the hydraulic and geologic characteristics of the area.

During most years, the snowmelt peak is the highest peak flow for the drainages. Under certain circumstances, when a significant summer thunderstorm occurs over the drainages, the runoff event can be quite large. In the area of the springs, there are sections with continuous flow, where the channel has cut into the perching layer of the spring. The flows from the springs continue a short distance downstream of the spring location; however, there is no base flow contribution within the channel itself. The only flow is a result of the spring discharge and this is absorbed by the channel fill indicating a losing stream reach. There are no indications that any other reaches of Lila Canyon or Little Park Wash are perennial. Since the spring of 2000, both areas have been observed numerous times (at least quarterly) and no flow has even been noted in either drainage. Normally, this would indicate an ephemeral drainage, however, since the drainage areas are

greater than one square mile and exhibit no consistent flows, they are classified by regulation as intermittent.

The ephemeral nature of the streams make it difficult to document the high and low flow periods. Generally, the seasonal flow pattern for the drainages consists of dry channels until a thunderstorm or rapid snowmelt occurs. Then there is a short duration of flow within a portion of the channel. Following the passing of the storm or melting of the snow the runoff quickly decreases and the channel is again dry until the next event.

Such an event was documented in March 05 near the monitoring station L-11-G reported in the DOGM database 05/06/05. This was flow from a snowmelt event. An attempt was made to get to the monitoring point, but the access to the site was inaccessible due to deep snow across the road up Lila Canyon. Access was available only a short distance (couple of hundred feet above the Horse Canyon Access road). A water sample was taken at the upper most point that could be accessed. This was an area that typically would have been dry with no flow. The flow recorded was 7.5 gpm and a water quality sample was taken. The data are presented in the DOGM database.

A number of perched springs do exist in the tributaries of the upper reaches of the Little Park Wash drainage; however, the flows from the springs dry-up or infiltrate into the alluvial fill of the canyons within 50 to 200 feet of the source, before reaching the main drainage channel. The springs and seeps in the area have been sampled, as indicated in this application, as part of the baseline and spring/seep inventories. Therefore, they provide an estimate of the quality of the flow within the drainages.

Precipitation in the area generally consists of either high-intensity, localized thunderstorms or area wide, frontal storms. Table 7-1A presents rainfall-runoff model simulation results of both the 6-hour and 24-hour rainfall events of the drainages in the site area, to simulate each kind of storm. Appendix 7-10, Figure 1 presents the location of the drainages for the simulation results in Table 7-1A. Appendix 7-10 also presents the simulation calculation results. These peak flow results show that for short duration events with small return periods (5 years or less), there is little or no runoff from the watersheds. Additionally, due to the localized character of the thunderstorms, the storms affect only a part of the watershed and the limited runoff that does occur is lost to channel losses (infiltration, evaporation, transpiration) within the portion of the watershed that is not affected by the rainfall event. As the return period of the storm increases, storms have greater intensity and tend to cover larger areas, which likely affects most if

not all of the watershed. Therefore, flows tend to increase. Intense rainfall may cause heavy flooding, but likely only affect small areas and do not result in large volumes of runoff.

For the long duration, frontal type storms, the entire watershed is covered for each event. The frontal precipitation events tend to produce only limited amounts of flow in the local ephemeral washes for the short return periods. With the increase in the return period, the flow events tend to be larger. This is due to the contribution from the entire watershed.

Each flow event in an ephemeral channel is separate and distinct. The stream flow is directly proportional to the amount of precipitation or snow-melt runoff, and the water quality varies greatly depending on the amount of flow. The duration of these runoff events is generally short. For thunderstorm events, the flow is generally less than a few hours. Duration of runoff from the frontal runoff events is moderate in length, generally on the order of 11 to 14 hours. Based on the end of rainfall from the watershed model simulations, the runoff would generally end within 3 to 5 hours. Therefore, if a sampler were not on-site during the event, it is unlikely that any flow would be observed.

Table 7-1A

**PEAK FLOW SIMULATIONS OF UNDISTURBED DRAINAGES
IN THE LILA CANYON MINE AREA**

Watershed ID	Return Period	2yr (cfs)	5yr (cfs)	10yr (cfs)	25yr (cfs)	50yr (cfs)	100yr (cfs)
WS1.1	6 hr	0	0	1.39	5.54	9.98	17.18
	24 hr	0.65	3.22	9.31	22.68	39.50	59.77
WS1.2	6 hr	0	0	1.21	6.43	12.77	22.18
	24 hr	0.86	3.82	9.45	20.66	33.99	49.70
WS1 Total	6 hr	0	0	2.37	11.78	22.68	38.79
	24 hr	1.50	6.62	16.96	39.59	67.46	100.70
WS7 Total	6 hr	0	0	2.23	10.43	19.63	33.75
	24 hr	1.29	6.04	15.85	36.15	60.94	90.24

Table 7-1A

PEAK FLOW SIMULATIONS OF UNDISTURBED DRAINAGES
IN THE LILA CANYON MINE AREA

Watershed ID	Return Period	2yr (cfs)	5yr (cfs)	10yr (cfs)	25yr (cfs)	50yr (cfs)	100yr (cfs)
WS8 Total	6 hr	0	0	0.85	3.60	6.59	11.34
	24 hr	0.43	2.09	5.76	13.64	23.46	35.09
WS9 Total	6 hr	0	0	3.46	16.17	30.46	52.36
	24 hr	2.01	9.38	24.59	56.08	94.53	139.99

Table 7-1A

**PEAK FLOW SIMULATIONS OF UNDISTURBED DRAINAGES
IN THE LILA CANYON MINE AREA**

Watershed ID	Return Period	2yr (cfs)	5yr (cfs)	10yr (cfs)	25yr (cfs)	50yr (cfs)	100yr (cfs)
Little Park 6.1	6 hr	0	0	1.63	6.48	11.66	20.08
	24 hr	0.76	3.76	10.88	26.5	46.16	69.84
Little Park 6.2	6 hr	0	0	0.93	3.70	6.66	11.47
	24 hr	0.44	2.15	6.21	15.14	26.36	39.89
Little Park 6 Cumulative	6 hr	0	0	2.56	10.18	18.33	31.54
	24 hr	1.20	5.91	17.09	41.63	72.52	109.74
Little Park 6.3	6 hr	0	0	0.32	1.21	2.15	3.70
	24 hr	0.14	0.70	2.17	5.47	9.75	14.92
Little Park 5.1	6 hr	0	0	0.31	1.00	1.73	2.93
	24 hr	0.11	0.59	2.41	7.85	15.16	23.59
Little Park 5.2	6 hr	0	0	0.73	2.75	4.87	8.38
	24 hr	0.32	1.59	4.92	12.40	22.10	33.82
Little Park 5 Cumulative	6 hr	0	0	2.82	11.34	20.41	35.22
	24 hr	1.77	8.54	24.80	61.16	107.32	163.42
Little Park 4.1	6 hr	0	0	0.75	2.58	4.47	7.65
	24 hr	0.29	1.49	5.31	14.72	28.04	43.72
Little Park 4.2	6 hr	0	0	0.76	3.01	5.42	9.33
	24 hr	0.36	1.75	5.06	12.32	21.46	32.47
Little Park 6.4	6 hr	0	0	0.23	0.86	1.53	2.64
	24 hr	0.10	0.50	1.55	3.90	6.95	10.64

Table 7-1A

**PEAK FLOW SIMULATIONS OF UNDISTURBED DRAINAGES
IN THE LILA CANYON MINE AREA**

Watershed ID	Return Period	2yr (cfs)	5yr (cfs)	10yr (cfs)	25yr (cfs)	50yr (cfs)	100yr (cfs)
Little Park 6.5	6 hr	0	0	0.90	3.58	6.45	11.10
	24 hr	0.42	2.08	6.02	14.66	25.53	38.63
Little Park 4 Cumulative	6 hr	0	0	6.17	24.81	44.74	77.12
	24 hr	2.93	14.01	40.73	101.08	178.91	269.04
Little Park 6.6	6 hr	0	0	0.87	4.44	8.64	14.92
	24 hr	0.58	2.60	6.58	14.58	24.18	35.52
Little Park 3.1	6 hr	0	0	2.35	8.86	15.72	27.03
	24 hr	1.03	5.13	15.87	40.00	71.27	109.07
Little Park 3.2	6 hr	0	0	1.00	4.65	8.76	15.07
	24 hr	0.58	2.70	7.08	16.14	27.20	40.29
Little Park 3 Cumulative	6 hr	0	0	9.73	42.29	77.65	133.01
	24 hr	5.08	23.46	65.66	162.22	284.24	430.10
Little Park 6.7	6 hr	0	0	0.76	4.53	9.00	15.63
	24 hr	0.60	2.69	6.66	14.57	23.96	35.04
Little Park 2.1	6 hr	0	0	0	1.84	4.30	7.79
	24 hr	0.17	0.81	2.54	7.96	14.23	24.90
Little Park 2.2	6 hr	0	0	0.64	3.68	7.15	12.35
	24 hr	0.48	2.16	5.45	12.07	20.02	29.40

Table 7-1A

**PEAK FLOW SIMULATIONS OF UNDISTURBED DRAINAGES
IN THE LILA CANYON MINE AREA**

Watershed ID	Return Period	2yr (cfs)	5yr (cfs)	10yr (cfs)	25yr (cfs)	50yr (cfs)	100yr (cfs)
Little Park 2 Cumulative	6 hr	0	0	11.07	54.40	100.57	168.92
	24 hr	6.59	29.31	80.68	192.12	329.11	493.91
Little Park Total	6 hr	0	0	11.56	58.64	110.02	183.99
	24 hr	7.24	31.45	84.30	199.12	340.37	508.74

To determine the extent of the protection of these runoff waters, the downstream state appropriated waters were evaluated. As listed in Table 7-2 and shown on Plate 7-3, the downstream water rights are held by the BLM and consist of 91-2617, -2618, -2619, -2620, -2621, -2646, -2665, -4516, -4646, -4648, and -4649. As reported in Table 7-2, most of these rights have no flow and no use associated with them. According to the State Engineers web site, these rights have not yet been evaluated to determine if there is sufficient water to meet the right. Many of these rights are located on the stream and some are for stock ponds to be located off stream. However, in reviewing these locations, except for 91-2621, no stock ponds have been located in these areas. The BLM pond located at the location of water right 91-2621 had some improvement work conducted in 2004 (see Appendix 7-9). However, the BLM was not involved in the pond improvements. Recent site investigation shows that the diversion structure described in Appendix 7-9 has been breached and no flow now reaches the pond from Grassy Wash.

There are two water rights for isolated stock ponds in the head waters of Stinky Spring Canyon, 91-4648 for Dryden Reservoir located in the SE/4, SW/4, Section 14, T16S, R14E and 91-4649 for Sams Pond located in the NW/4, NE/4, Section 23, T16S, R14E (see Plates 7-1 and 7-3). Both of the water rights are owned by the BLM and have a maximum capacity of 3 ac-ft. No records have been found that these ponds were constructed. Based on the maximum capacity of the ponds, it is expected that these ponds would be about one half acre in size, assuming a depth of 5 feet. Field inspection of the quarter sections found no ponds along the ephemeral drainages and review of aerial photos of the area also did not reveal any ponds in the area. Based on the locations for

the water rights, the area for water right 91-4648 is shown in a photograph presented in Attachment 1 of Appendix 7-7 (Photo 93 - Page 28). As can be seen, there is no stock pond in this area. The area for water right 91-4649 is shown in photographs taken in the area (see Figure 7-5) indicated in the water right of the pond. No pond has been found. The only thing found in the designated area is an area of grass in the pinyon juniper.

Based on water rights flow values and the lack of a specified use, it is assumed that the State Engineer and the BLM had planned to develop range improvements in the area, but the lack of water made this effort unsuccessful. Given the lack of use for these downstream channels, it does not appear that a significant concern exists for the downstream waters.

Surface waters in this part of the Book Cliffs drain to the Price River. The Price River flows to the Green River which, in turn, flows to the Colorado River. It is anticipated that only during extremely long duration, high-intensity thunderstorms that flow from the ephemeral and intermittent drainages within the permit area would reach the Price River. Due to the length of channel and the limited volume of runoff, the majority of flow is lost to channel losses, as indicated in Appendix 7-9.

Lines and Plantz (1981, p. 33) conducted three seepage surveys of Horse Canyon Creek in 1978 and 1979. The results of the surveys show no consistent trends through time. Mine discharges created difficulties in interpretation of the data because there was no indication of whether the mine was or was not discharging water at the time of the surveys. However, Horse Canyon Creek below the mine is a losing stream, due to the visual observation of low flows decreasing downstream of the mine (professional observations, Thomas Suchoski, 1979-1980 & 1984-86). Flow in the channel adjacent to the mine facility entry portal on several occasions during mine inspections during the spring period were approximately 4 to 6 inches deep, with a flow width of 15 to 20 feet. Downstream of the mine in the area of the roadside refuse pile, the flow would be 2 to 3 inches deep with a flow width of 10 to 12 feet. Channel slopes in both areas were similar. No diversions are present along this reach of the channel to reduce the flow. Therefore, the channel flow decrease is the result of infiltration and evaporation of the water within the channel.

The Lila Canyon drainage is normally dry, flowing only in response to precipitation runoff or rapid snowmelt. The mine facilities will be located in the Right Fork of Lila Canyon.

In January 2004, an assessment of the geomorphic character of the Lila Canyon channel, downstream of the proposed mine site, was conducted to address

DOGM comments. A series of channel cross-section measurements were taken and the bed and bank materials visually observed. During this evaluation, it was discovered that a diversion structure had been installed just above the confluence of the Right Fork of Lila Canyon and Grassy Wash (see Appendix 7-9 and Figure 7-3). This diversion structure diverted all flow from the drainage and conveyed it by diversion channel to a stock pond located in the SW/4, SW/4 of Section 28, T. 16 S., R. 14 E. Subsequently, it was thought that the improvements were part of a BLM range improvement project. This structure significantly modified the drainage pattern for this area. Flows that previously would have flowed into Grassy Wash would now be detained in the stock pond. However, in discussions with BLM personnel, it was discovered that the BLM was not involved in the pond improvements. Recent site investigation shows that the diversion structure described in Appendix 7-9 has been breached and no flow now reaches the pond from Grassy Wash.

The closest perennial stream to the permit area is Range Creek. The drainage is located approximately 6 miles east of the proposed Lila Canyon permit area boundary (see Plate 7-1a).

Range Creek is in a broad, south-southeast oriented drainage that has been eroded into the Roan Cliffs. A western extension of the Roan Cliffs (Patmos Ridge) lies between Range Creek and the Book Cliffs. The proposed Lila Canyon operation is on the west side of Patmos Ridge. 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 Formation. 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 further south, along the Price River.

Argument has been made that Range Creek receives recharge from a regional aquifer which is likely from the lower saturated zone that the Lila Canyon Mine will be mining or that the overlying perched upper zone might be drained by the mining activities and affect the flows contributing to and in Range Creek.

To address these concerns, the following issues were evaluated. An evaluation of the elevation difference between the saturated ground-water zone in the Blackhawk Formation and stream flows in the Range Creek drainage was conducted, especially for the reaches nearest the permit area. Also, the thickness and composition of the strata between the coal seam and the creek was conducted. Further, the potential for diminishment of spring and tributary

flows to the Range Creek drainage resulting from subsidence impacts within the recharge area to the overlying strata was evaluated.

If the deeper ground water in the Blackhawk Formation were to flow following either the gradient indicated by the piezometers (see Figure 7-1) or geologic dip (see Plate 7-1B), the water would flow well below Range Creek (800 to 1,200 feet) in the reaches nearest the Lila Canyon Mine and for many miles downstream.

Additionally, the thick section of strata between Range Creek and the Blackhawk Formation would impede hydraulic interaction between any deep ground water and the surface (Plates 7-1A and 7-1B). It is estimated that the vertical separation between the Blackhawk and Range Creek at the base of the Colton would be about 1,200 feet.

A review of U.S. Geological Professional Paper by D.J. Fisher, C.E. Reeside and J.B. Erdman, 1960, **Cretaceous and Tertiary Formation of the Book Cliffs, Carbon and Emery Counties, Utah**, which evaluates the composite stratigraphy in the Horse Canyon area, was conducted. The lithology descriptions were reviewed and a total of the percentage of shale, siltstone and mudstone (less permeable layers), for each strata identified by the authors, was generated to get an idea of the ability of each strata to restrict flow throughout the stratigraphic column.

Colton Formation		
Upper Sandstone Unit	1,300 ft.	
% Shale		23.1
Shale Unit	960 ft.	
% Mudstone		82.9
Lower Sandstone Unit	1,128 ft.	
% Shale and Mudstone		34.8
North Horn–Flagstaff, Undifferentiated		
Shale beds	237 ft.	
Mudstone	181 ft.	
Limestone	21 ft.	
Siltstone	25 ft.	
Clay	7 ft.	
Sandstone beds	99 ft.	
%Shale, Clay, Siltstone, and Mudstone		79.0
Price River Formation		
Upper Unit	299 ft.	

% Shale		43.8
Lower Unit	234 ft.	
% Shale and Siltstone		43.8
Castlegate Sandstone	160 ft.	
% Shales, Clays, Siltstones or Mudstones		0
Blackhawk Formation		
Upper Shale Unit	170 ft.	
Middle Sandstone Unit	0 ft.	
Middle Shale Unit	102 ft.	
Lower Sandstone Unit	200 ft.	
% Shale		52.5

Based on the stratigraphic column in the area, the overall percentage of less permeable strata is 47 percent. Looking at the distribution of the less permeable strata, the majority is in the upper lithographic units. The Colton and North Horn-Flagstaff contain about 1940 feet of less permeable units, while the Price River and Blackhawk contain about 480 feet. Therefore, there is little potential for water to move vertically between the upper and lower zones. The main direction of water movement will be horizontally within the strata.

Further, the elevation of Range Creek in the area of concern ranges from 6890 to 5740 feet (see Plate 7-1A). The coal seam exposure along the Book Cliffs ranges from 5,500 to 6,000 feet. Therefore, for water to flow from the coal seam to Range Creek the flow would need to overcome a hydraulic head difference of 200 plus feet, just based on the initial elevation and not accounting for dip of the formations. There is insufficient head and no source of water to provide the driving head for such conditions.

In regard to subsidence affecting the potential recharge to the springs and tributaries to Range Creek, as described in Chapter 5, Section 525, the subsidence limits from the proposed mining are required to be limited to the area of the permit boundary. Therefore, the recharge area to Range Creek that the mine might affect is limited to that portion of the recharge area within the permit boundary.

To determine the recharge area to Range Creek, a review of the relationship of the proposed permit area, location of Range Creek and the geology in the area, as shown on Plate 7-1A, in the reach nearest to the proposed mine, was conducted. As is evident on Plate 7-1A, the Little Park drainage has eroded through the Colton and North Horn Formations and into the Price River Formation, while the Range Creek drainage has not eroded through the Colton

Formation. Based on this and the previous discussion of the high percentage of low permeable strata within the Lower Colton and North Horn-Flagstaff formations, there is limited potential for recharge to the springs and tributaries from areas below the bottom of the Colton Formation. Figure 7-3 presents a representation of the likely characterization of the method of recharge to these springs. The potential impact area from the mine is, therefore, that portion of the permit area that is east of the Horse Canyon and Little Park drainages which is above the Colton - North Horn-Flagstaff contact within the area of maximum subsidence.

Based on a projection of the direction of dip (N68°E), the recharge area of the Range Creek drainage that might be affected by the mine would be from just north of Little Horse Canyon south to Cherry Meadow Canyon. Figure 7-4 presents a localized view of this area with recharge potential along the west side of the Range Creek drainage. The total recharge area to this portion of the Range Creek drainage is approximately 18,150 acres.

Based on a review of Figure 7-4, the portion of the permit boundary that meets the potential impact area criteria is approximately 183 acres. Therefore, the percentage of the recharge area that might be intercepted by catastrophic subsidence is 1.0 percent. As catastrophic subsidence is unlikely due to the cover over the coal seam for most of this area (2,000ft +) (see Figure 7-4), this percentage is conservatively high. Such a small percentage would not be measurable within the Range Creek drainage.

If such an occurrence were to happen, based on the hydraulic conductivity (0.1gpd/ft²) and porosity (0.25) of the formation and the anticipated gradient (0.1ft/ft), the average linear velocity of flow through the formation would be about 0.006ft/day. This results in an estimated duration, for the reduced recharge to move laterally through the Colton Formation and reach the Range Creek drainage, to be about 8,700 to 11,300 years.

As a result of the five to six miles horizontal distance from proposed permit area to Range Creek (see Plate 7-1a) and the isolating effects of the over 1,000 feet of low-permeability, isolating strata between the coal seam and the creek elevation (see Plate 7-1B and Table above) and the limited potential impact of subsidence damage to the recharge area, it is not likely that the Lila Canyon Mine will adversely effect Range Creek. Due to these conditions, no baseline or other sampling has been gathered nor is anticipated on Range Creek.

Additional concerns have been raised regarding the potential impact that water extracted from the Blackhawk Formation as a result of the mining activities would have on the downstream drainages, specifically the Price and Green Rivers.

Initial evaluation indicates that the distance within the Blackhawk Formation between the mine and the Price River is over 12 miles. This distance alone would preclude any significant impact.

As further evidence, as discussed in Appendix 7-3, it is difficult to determine the amount of water that will be extracted by the mining activities. For design purposes, DOGM has required that a value of 500 gpm be used. This is thought to be very conservative. If this volume were extracted, the yearly total would be about 800 ac-ft per year. As there are no significant springs that discharge from the Blackhawk Formation, the loss of this flow would be minimal. Also, as discussed in Appendix 7-3, the addition or loss of this flow would result in a 0.9% flow change to the Price River and a 0.02% flow change to the Green River. In both cases, this flow change would be less than could be measured by standard methods.

The Horse Canyon drainage is monitored in accordance with the approved monitoring plan for the permit. There has been only one sample taken in the Lila Canyon and no samples taken in Little Park Wash because only limited flow has been observed during the monitoring activities. Factors that contribute to the lack of data are: accessibility to the sites during the winter period and immediately after summer rain storm events is generally not possible, due to safety issues and a physical lack of flow. Concerns have been raised that evidence of flow has been seen in the drainages over the course of the year, therefore, why hasn't a water quality sample been collected. The following sections address the concerns of access and safety, physical lack of flow, and monitoring methods.

Access and Safety. Safety issues have hampered field work on several projects in the area. When the soils in the area get wet from a light rain, that would not generate a flow event, they become very slick and pose access and safety issues. During the IPA drilling, EarthFax had significant difficulty in getting equipment and vehicles up and down the access road following several small rain storms. In one case, they had one of their vehicles slide into the embankment rocks along the Horse Canyon access road (drop in the area was about 400 feet).

In the conditions of heavier rains, access during rainstorms through the channels in the area is dangerous. During the avian study for the Westridge mine, Mel Coonrod (EIS) and Frank Howe (DWR) were caught in a channel during a rainstorm and lost their vehicle to flooding. This occurred on Nine Mile Creek at the Dry Canyon crossing in March or April of 2000. Conditions in this drainages are similar to drainages within the Lila Canyon Permit Area.

During winter and early spring periods, there have been times when the access road has been blocked with several feet of snow making access with the field equipment impossible.

UAE's position is that collection of environmental data is not worth of the loss of life or limb. Therefore, when the conditions are unsafe, the site is labeled inaccessible. At all other times, the sites are visited and if no flow is encountered it is reported as such.

Physical Lack of Flow. The lack of flow data in the sampling effort is not a failure of the sampling effort. The lack of flow at these sample sites is data which documents the normal conditions in the site area. If the streams were flowing 50 percent of the time, it is likely that the sampling efforts would encounter flow on an infrequent basis. However, if the flow for the short return periods is extremely small or none existence, it will be difficult to obtain and provide samples of these events. This lack of flow shows that the drainages do not have a base flow component and there is no regional aquifer discharging to the deeply incised canyons and drainages in the area. The sequence of sampling efforts have demonstrated further, that there are no long-term flow events occurring in the mine permit area or adjacent areas. Also, spring photographs show disturbances in the stream channels from the previous fall period sampling efforts, indicating that for some years no flow occurred from the fall to spring measurement events. Additionally, the peak flow simulation results presented in Table 7-1A show that for small return periods, 2 to 5 year events, runoff flows are not expected and that the duration of any flow events would be of extremely limited duration.

Therefore, a pattern has been identified of a set of drainages that only flow in direct response to precipitation or rapid snow melt. The flow events are localized, sporadic events with no consistent sequence and timing and are extremely limited in duration. For ephemeral drainages in the area, these are the variations and distributions in flow that can be expected and are seen at other mines. Under the definitions in the rules, the seasonal variation would then be the isolated snowmelt in various reaches of the channels in the spring period, and the isolated peak flow from a thunder storm that would have enough intensity to result in a runoff event. Based on the runoff simulations in Table 7-1A, for the larger precipitation events, the flows can be significant.

U.S. Steel conducted water quality monitoring of the Horse Canyon drainage. These monitoring efforts were conducted prior to the development of DOGM's present Water Monitoring Guidelines, and as a result the data is quite limited. The most recent results of these water monitoring efforts are presented in Appendix 7-2 and historic results are included in the DOGM electronic database.

The data collected from Horse Canyon follows the same pattern documented by Waddell, et.al. (1986). The pattern shows that the TDS concentrations for surface waters on the lower Blackhawk and out onto the Mancos Shale range from 1000 mg/l and increase to 2,000 to 2,500 mg/l. Additionally, the highest concentrations of suspended sediment will occur during high-intensity runoff from thunderstorms, and the lowest concentrations will occur during low flow or snow melt events.

Therefore, because of the similarity of the water quality data, the water quality expected from the drainages in the area of the proposed mine will be similar to the water quality found in the Horse Canyon drainage.

Monitoring Methods. Monitoring efforts did not include remote or automatic sampling efforts because of inherent problems attempting to implement these methods for this application. It has been suggested that crest-staff gauges, single-stage samplers, ISCO instruments, etc. could be used to collect samples. These are methods that the USGS uses for developed remote sampling sites. However, none of the UEI sampling sites are developed. In the case of crest gauges, for these methods to be reliable and feasible, the sites need to be developed with concrete or bedrock lined channel sections. For the channel configurations at the UEI sites, the channel bottoms generally consist of movable beds. These are channels that change configuration from storm to storm. As a result of channel erosion and deposition, the stage discharge relationship of the channel changes with each storm event. Therefore, while the crest gauge would indicate that a flow event may have occurred, the ability to determine what the flow rate was is greatly compromised. To be able to overcome this, it would be necessary to construct lined channel sections in remote channel areas. In some cases, this would require the construction of access ways and cement trucks to haul in the materials necessary. This would likely cause more damage than it is worth.

Single stage and automatic samplers have problems with holding time on many water samples being exceeded, routine clogging of the inlets to the sampler, and acceptability or reliability of the data. Holding time exceedence would occur when a storm event occurred immediately after a prior sampling visit and resulted in a sample being collected. As a result, the sample would remain in an unpreserved and unrefrigerated state for the duration of the period until the site was next visited. In the hot summer conditions, common in the area, the water quality of unpreserved and unrefrigerated samples would not be representative of the water in the drainage during the flow event. Changes to water quality parameters would be expected with changes in temperature of the sample, concentration due to evaporation of the sample, and extended contact of the water with the sediment collected in the sample bottle. Therefore, for the

majority of parameters in the monitoring guidance list, the water quality data would not be usable for determining the baseline or impact conditions.

Maintenance problems have been common problems with the use of remote samplers. Generally, these samplers work fairly well in perennial sampling environments. However, in ephemeral environments where the flows tend to be "flashy" - short duration events which carry a heavy sediment and debris load, these samplers encounter significant problems with plugging of the inlets or sampler damage or destruction.

The use of stage or automatic samplers on ephemeral streams does not meet the USGS sampling protocols and are not a depth integrated sample. According to the Shelton (1994), there are no protocols for adequately sampling an ephemeral stream and ephemeral streams are not included in the national water-quality assessment program. Australian water quality monitoring guidelines suggest that automatic samplers are not appropriate for sampling parameters that change with time (A-NZECC, 2000). ADOT (2005) removed all automatic samplers from their monitoring program. Only grab samples are allowed and ADOT will not accept any data collected by any automatic samplers. Recent information provided to ADOT indicates that automatic samplers are unreliable and impractical in arid climate conditions in Arizona. As the conditions in the arid climate in Southeastern Utah are similar to the Arizona conditions, similar difficulties and problems will be encountered and the data will have the same difficulties.

Several samplers were installed as part of the Westridge Mine sampling efforts. The samplers have problems with plugging and malfunctions on a regular basis and need constant maintenance. They are still in use, because they were required, however, the data are of limited value (Karla Knoop, personal communication, 2006). Single stage and automatic samplers were also installed as part of the Smoky Hollow baseline data collection efforts. Similar maintenance and malfunction problems were identified as part of the Smoky Hollow sampling efforts (Richard White, personal communication, 2006).

Radio Frequency telemetry (RF) sensing equipment has also been considered. However, as most of the monitoring sensors require line of sight and these sites are in remote, incised canyons or drainages, that was not considered a viable option.

As a result of these difficulties, it was determined that these methods would not provide any better data than was already being collected. The concerns with what conclusions erroneous or questionable data would generate versus limited good data lead to the decision that these methods would not be used.

724.300 Geologic Information Detailed geologic information of the permit and adjacent areas is included in Section 600, with specific strata analyses, as required, in Section 624.

724.310 Probable Hydrologic Consequences. The geologic data indicate that no toxic- or acid-forming materials are known to exist in the coal or rock strata immediately below or above the seam (see Section 624.300). The probable hydrologic consequences of the proposed operation will be discussed in Section 728 and Appendix 7-3 of this application.

724.320 Feasibility of Reclamation. The geologic data in Section 600 provides sufficient detail to allow: the evaluation of whether toxic- or acid-forming materials are expected to be encountered in mining; subsidence impacts; whether surface disturbed areas are designed to be constructed in a manner that will allow for reclamation to approximate original contour; and whether the operation plans have been design to ensure that material damage to the hydrologic balance does not occur outside of the permit area. These issues are evaluated in the R645 rules and discussed in Section 728 of this application.

724.400 Climatological Information

724.410 Climatological Factors

724.411 Precipitation The closest weather recording station to the Lila Canyon Mine is located at Sunnyside, Utah. Based on the relatively close proximity and similar locations (west exposure of the Book Cliffs) the data from this station is representative of the type, intensity and duration of the precipitation at the site area and will be used to verify precipitation amounts and other weather conditions for the Lila Canyon Mine.

Precipitation data from the Sunnyside station has been gathered from 1971 to 2005, showing an average annual precipitation of 14.74 inches. The information was downloaded from the Western Regional Climate Center, as shown on Table 7-1B. The distribution of precipitation shows that September and October average the highest totals. Based on a 1-day precipitation event or less, the probability of precipitation is generally less than 20 percent for an event with 0.01" and less than 5 percent for an event with greater than 0.50" (see Table 7-1C). This indicates that the precipitation events are generally light and consist of infrequent small storms.

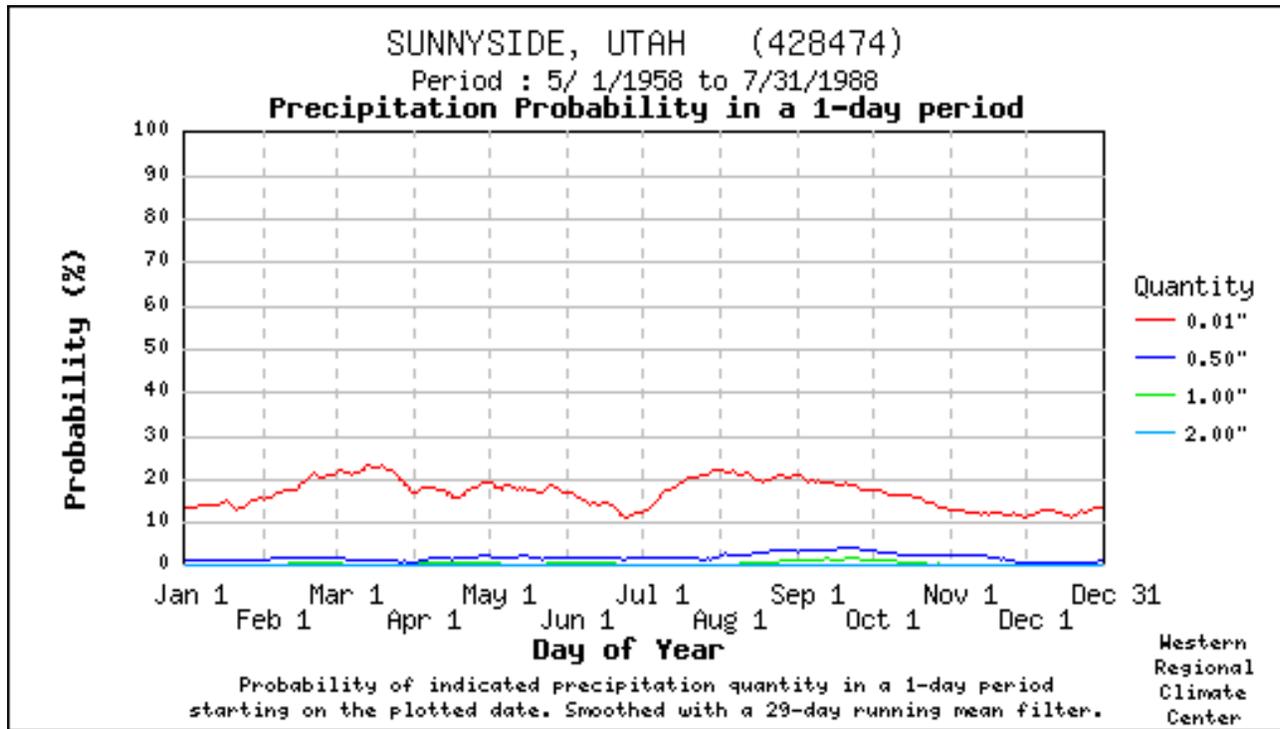
A rain gauge will be installed at the site, once construction and operations start, to comply with the reporting requirements of the air quality permit.

724.412 Winds. The average direction of the prevailing winds is West to East, and the average velocity is 2.74 knots.

Table 7-1B

Sunnyside, Utah (428474) Period of Record Monthly Climate Summary													
Period of Record: 1971 - 2000													
	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann.
Average Max. Temp(F)	33.7	38.4	44.1	54.0	63.5	76.2	82.4	80.3	71.3	58.3	42.8	34.9	56.8
Average Min. Temp(F)	13.9	17.5	21.8	30.0	38.3	47.2	53.6	52.2	44.7	34.6	22.8	15.3	32.8
Average Total Precip (in.)	0.80	1.01	1.30	1.22	1.22	0.85	1.46	1.50	1.80	1.67	1.14	0.78	14.74
Unofficial values based on averages/sums of smoothed daily data, Information is computed from available daily data during the 1971-2000 period. Smoothing, missing data and observation-time changes may cause these 1971-2000 values to differ from official NCDC values. This table is presented for use at locations that don't have official NCDC data. No adjustments are made for missing data or time of observation. Check NCDC normals table for official data.													

TABLE 7-1C



724.413 Temperature. Mean temperatures in the proposed mine area range from a high of 58.0 degrees F to a low of 33.4 degrees F. See Table 7-1B.

724.420 Additional Data. Additional data will be supplied if requested by the Division to ensure compliance with the requirements of R645-301 and R645-302.

724.500 Supplemental Information N/A - The determination of the PHC in Section 728 does not indicate 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.

724.700 Valley/Stream N/A - The proposed plan does not include mining or reclamation operations within a valley holding a stream or in a location where the permit area or adjacent area includes a stream which meets the requirements of R645-302-320.

725. Baseline Cumulative Impact Area Information

725.100 Hydrologic and Geologic Information Hydrologic and geologic information for the mine area is provided in Sections 600, 724 and in the PHC Determination in Appendix 7-3. This information includes the available information gathered by the applicant. Additional information is available for the areas adjacent to the proposed mining and adjacent areas from state and federal agencies.

725.200 Other Data Sources As indicated above, additional information is available for the cumulative impact area. In addition to the base line data for the proposed mining, additional pertinent hydrologic data is available from adjacent mines and permits and government reports.

725.300 Available Data Necessary hydrologic and geologic information is assumed to be available to the Division in this P.A.P.

726. Modeling Where ever possible actual surface and ground water information is supplied in this application. However, the following models were used to supplement the data.

Storm 6.2, a program to calculate runoff flows was used to calculate runoff from some disturbed area drainage areas.

Hydroflow Hydrograph program by Intelisolve was used to simulate the runoff and routing from the undisturbed drainages above the proposed mine. As discussed in Section 724.200 of the MRP, the flow simulations provide an understanding of the types and kinds of flow responses that can be expected from the watersheds of the proposed mine area.

A simulation of transmission losses to determine potential impacts from mine water discharge to the Price River and fishery was completed using a spreadsheet based on the NRCS channel loss evaluation.

727. Alternate 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 those rights are shown on Plate 7-3, based on the location provided for the water right. A description of each of the rights, including the name of the water right owner, point of diversion, source of the water, along with the allotted flow and the designated use of the water is tabulated in Table 7-2. Due to the limited volume of water available, the condition of most of the spring and stock pond facilities is very poor. Based on the water rights, for the area

of the mine, the use is limited to stockwatering of less than 250 animal units.

Table 7-2						
LILA CANYON MINE AREA						
Water Rights						
Water Right/Owner	cfs	gpm	ac.ft.	Source	Use	Point of Diversion
91-557 Eardley, Joseph K.	0	-	0	So. Fork Horse Canyon Creek	Stockwatering	SW 34, T. 15 S, R. 14 E.
91-557 Eardley Joseph K.	0	-	0	So. Fork Horse Canyon Creek	Stockwatering	NE 34, T. 15 S, R. 14 E.
91-1903 State of Utah	0.08	36	0	Spring	Stockwatering	SE 35, T. 15 S, R. 14 E.
*91-148 IPA	0.30	135	0	U. G. Tunnel	Other	NW 3, T. 16 S., R. 14 E.
*91-149 IPA	0.10	45	0	U. G. Tunnel	Other	NW 3, T. 16 S., R. 14 E.
*91-150 IPA	0.10	45	0	U. G. Tunnel	Other	NW 3, T. 16 S., R. 14 E.
*91-4959 CEUF	0.00	-	5.00	Redden Spring	Mining	NE 3, T. 16 S., R. 14 E.
91-2616 BLM	0	-	0	Stream	Stockwatering	NW 3, T. 16 S., R. 14 E.
*91-183 CEUF	0.8	359	0	Horse Canyon Creek	Domestic, Other	SE 1/4 3, T.. 16 S., R. 14 E.
91-185 Minerals Devel. Co.	0.0190	9	0	Well	Domestic, Other	NW 9, T. 16 S., R. 14 E.
91-618 Mont Blackburn	0.0110	5	0	Mont Spring	Stockwatering	NE 11, T. 16 S., R. 14 E.
91-2615 BLM	0	-	0	Stream	Stockwatering	NW 10, T. 16 S., R. 14 E.
91-617 Mont Blackburn	0.0110	5	0	Leslie Spring	Stockwatering	NW 11, T. 16 S., R. 14 E.

Table 7-2						
LILA CANYON MINE AREA						
Water Rights						
Water Right/Owner	cfs	gpm	ac.ft.	Source	Use	Point of Diversion
91-4650 BLM	0	-	0	Tributary to Flat Wash	Stockwatering, Other	SW 9, T. 16 S., R. 14 E.
*91-399 IPA	0.050	22	0	Unnamed Spring	Mining, Other	SE 12, T. 16 S., R. 14 E.
91-2537 BLM	0.0120	5	0	Spring	Stockwatering	SE 12, T. 16 S., R. 14 E.
91-2521 BLM	0.0110	5	0	Cottonwood Spring	Stockwatering	NE 13, T. 16 S., R. 14 E.
91-4648 BLM	0.00	-	0	Unnamed Wash	Stockwatering, Other	SW 14, T. 16 S., R. 14 E.
91-4649 BLM	0	-	0	Unnamed Wash	Stockwatering, Other	NE 23, T. 16 S., R. 14 E.
*91-810 IPA	0.050	22	0	Unnamed Spring	Mining, Other	SE 24, T. 16 S., R. 14 E.
91-2517 BLM	0.0110	5	0	Pine Spring	Stockwatering	SE 24, T. 16 S., R. 14 E.
91-2618 BLM	0	-	0	Stream	Stockwatering	NW 27, T. 16 S., R. 14 E.
91-2619 BLM	0	-	0	Stream	Stockwatering	SE 28, T. 16 S., R. 14 E.
91-2620 BLM	0	-	0	Stream	Stockwatering	SE 28, T. 16 S., R. 14 E.
91-2621 BLM	0	-	0	Stream	Stockwatering	SW 28, T. 16 S., R. 14 E.
91-2617 BLM	0	-	0	Stream	Stockwatering	SE 27, T. 16 S., R. 14 E.
91-4646 BLM	0	-	0	Wash	Stockwatering, Other	SW 33, T. 16 S., R. 14 E.
91-2518 BLM	0.110	5	0	Williams Spring	Stockwatering	SE 8, T. 17 S., R. 15 E.

Table 7-2						
LILA CANYON MINE AREA						
Water Rights						
Water Right/Owner	cfs	gpm	ac.ft.	Source	Use	Point of Diversion
91-4516 BLM	0	-	0	Little Park Wash	Stockwatering, Other	SW 7, T. 17 S., R. 15 E.
91-4705 BLM	0	-	0	Bear Canyon	Stockwatering, Other	NW 7, T. 16 S., R. 15 E.
91-4621 BLM	0.0150	7	0	Kenna Spring	Stockwatering, Other	NE 8, T. 16 S., R. 15 E.
91-4701 BLM	0	--	0	Nelson Canyon	Stockwatering, Other	NW 17, T. 16 S., R. 15 E.
91-2519 BLM	0.0110	5	0	Unnamed Spring	Stockwatering, Other	SE 18, T. 16 S., R. 15 E.
*91-808 IPA	0.050	22	0	Unnamed Spring	Mining, Other	SW 18, T. 16 S., R. 15 E.
91-2538 State of Utah	0.0120	5	0	Unnamed Spring	Stockwatering	SW 18, T. 16 S., R. 15 E.
91-4701 BLM	0	-	0	Nelson Canyon	Stockwatering, Other	SE 17, T. 16 S., R. 15 E.
91-2539 BLM	0.0120	5	0	Pine Spring	Stockwatering	SW 19, T. 16 S., R. 15 E.
91-4703 BLM	0	-	0	Nelson Canyon	Stockwatering, Other	NW 21, T. 16 S., R. 15 E.
91-4703 BLM	0	-	0	Trib. to Nelson	Stockwatering, Other	NE 29, T. 16 S., R. 15 E.
91-4381 State of Utah	0.0150	7	0	Spring	Stockwatering,	NW 32, T. 16 S., R. 15 E.
91-2520 BLM	0.0110	5	0	Unnamed Spring	Stockwatering	NW 32, T. 16 S., R. 15 E.
*91-809 IPA	0.0500	22	0	Unnamed Spring	Mining, Other	SE 31, T. 16 S., R. 15 E.
91-2535 BLM	0.0120	5	0	Unnamed Spring	Stockwatering	SE 31, T. 16 S., R. 15 E.

Table 7-2						
LILA CANYON MINE AREA						
Water Rights						
Water Right/Owner	cfs	gpm	ac.ft.	Source	Use	Point of Diversion
91-2646 (Cove #1)	0	0	0	Wash	Stock Watering	NE 06, T.16S., R. 14E.
91-2665 ((Big Pond)	0	0	0	Wash	Stock Watering	NE4 05, T.17S., R. 14E.

Any State-Appropriated water supply that may be damaged by mining operations will either be repaired or replaced. As soon as practical, after proof of damage by mining in Lila Canyon, of any State-Appropriated water supply, UEI will replace the water. Water replacement may include sealing surface fractures, piping, trucking water, transferring water rights, or construction of wells. The preferable method of replacement will be sealing of surface fractures effecting the water supply. As a last resort UEI will replace the water by transferring water rights or construction of wells.

As noted in the table, the majority of rights are owned by UEI for industrial use. Other rights owned by the B.L.M. or individuals are primarily for stockwatering.

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

728. Probable Hydrologic Consequences (PHC) Determination

728.100 PHC The Probable Hydrologic Consequences (PHC) Determination is provided as a separate document in Appendix 7-3. This determination indicates minimal (or no) 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.

728.200 Basis for Determination The PHC is based on baseline hydrologic, geologic and other information such as public records and adjacent mine plan data statistically representative of the site (see Appendix 7-3).

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 stratas between the mining 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 U.P.D.E.S. requirements.

Water in this area is primarily used for stock or wildlife watering. Any impacts to the small surface springs or seeps as a result of mining would likely be offset by the emergence of new seeps or springs due to fracturing, mine water discharge or replacement of water rights as described under Sections 525, and 731.800.

728.300 Findings

728.310 Adverse Impacts. Potential adverse impacts of the operation on the hydrologic balance include:

- (1) Increased sediment loading;
- (2) Diminution or interruption of water supplies on water rights;
- (3) Discharge (pumping) 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 (Appendix 7-3). Based on information provided in this plan to mitigate or otherwise control these impacts, the Probable Hydrologic Consequences determination is that of minimal (or no) negative impacts. (see Appendix 7-3)

728.320 Acid/Toxic Forming Materials (see Appendix 7-3)

728.330 Impacts On:

728.331 Sediment Yield (see Appendix 7-3)

728.332 Water Quality Parameters (see Appendix 7-3)

728.333 Flooding and Streamflow Alteration In the event that sufficient volumes of water are encountered underground that necessitate pumping, the applicant will take the following steps:

- (1) Water will be held in sumps as long as possible to promote settling;
- (2) Water will be sampled prior to discharge to ensure compliance with UPDES standards;
- (3) Prior to mining receiving channel morphology parameters and erosion impacts will be evaluated prior to discharging to any drainage and at least quarterly during pumping to determine what, if any, streamflow alteration is occurring;
- (4) If adverse impacts to the receiving stream are noted, steps will be taken, with Division input and approval, to minimize or eliminate those impacts.

(Also see Appendix 7-3)

728.334 Water Availability (see Appendix 7-3)

728.335 Other Characteristics (see Appendix 7-3)

728.340 Surface Mining Activity N/A - Underground Mine

728.400 Permit Revision To be reviewed by the Division.

729. Cumulative Hydrologic Impact Assessment (CHIA)

729.100 CHIA Assessment provided by Division.

729.200 Permit Revision To be reviewed by the Division.

730. Operation Plan

[See Appendix 5-9 for hydrology rules associated with the Graben Breakouts.](#)

731. General Requirements This will be an underground mine with approximately 42.6 acres of surface disturbance for mine site facilities and roads. Runoff from the disturbed minesite area is proposed to be controlled by a system of ditches and culverts which will convey all

disturbed area runoff to a sediment pond for final treatment prior to discharge.

This permit application includes a plan, with maps and descriptions, indicating how the relevant requirements of R645-301-730, R645-301-740, R645-301-750 and R645-301-760 will be met. Each of these sections are addressed in this Chapter, along with relevant Maps and Appendices.

731.100 Hydrologic-Balance Protection

731.110 Ground-Water Protection In order to protect the hydrologic balance, coal mining and reclamation operations will be conducted according to the plan approved under R645-301-731 and the following:

731.111 Ground-Water Quality Ground-water quality will be protected by the plan described in Section 731 and the following:

- (1) Minimizing surface disturbance and proper handling of earth materials to minimize acidic, toxic or other harmful infiltration to ground-water systems. Appendix 6-2 of the MRP presents acid and toxic results from a series of roof and floor samples from the areas north and south of the proposed mine. The samples of the S-24 and S-25 drillholes show the quality of the roof and floor strata located to the south of the proposed operation, while the Lila Fan Portal roof and floor samples show the quality of the strata north of the proposed mine. These samples identified only minor issues with one or two samples for revegetation issues. The recommendations were that these samples would not be a problem when mixed with the surrounding rock. No acid conditions were identified in any of the rock samples. As these samples bracket the mine property and the quality is similar to quality found at other mines along the Book Cliffs and none of these mines have an acid or toxic issue, then it is likely that the rock in the proposed mine area will have the same characteristics.;
- (2) Testing (as-necessary) to ensure stockpiled materials are non-acid and non-toxic;

- (3) Controlling and treating disturbed area runoff to prevent discharge of pollutants into ground-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 U.P.D.E.S. discharge standards;
- (5) Establishing where ground-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).

731.120 Surface-Water Protection In order to protect the hydrologic balance, coal mining and reclamation operations will be conducted according to the plan approved under 731 and the following:

731.121 Surface-Water Quality Surface-water quality will be protected 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 prevent water pollution.

Surface-water quality protection is proposed to be accomplished by the plan described in Section 731 and the following methods:

- (1) Minimizing surface disturbance and proper handling of earth materials to minimize acidic, toxic or other harmful infiltration to ground-water systems. Appendix 6-2 of the MRP presents acid and toxic results from a series of roof and floor samples from the areas north and south of the proposed mine. The

samples of the S-24 and S-25 drillholes show the quality of the roof and floor strata located to the south of the proposed operation, while the Lila Fan Portal roof and floor samples show the quality of the strata north of the proposed mine. These samples identified only minor issues with one or two samples for revegetation issues. The recommendations were that these samples would not be a problem when mixed with the surrounding rock. No acid conditions were identified in any of the rock samples. As these samples bracket the mine property and the quality is similar to quality found at other mines along the Book Cliffs and none of these mines have an acid or toxic issue, then it is likely that the rock in the proposed mine area will have the same characteristics. Also, the rock from the access tunnels will be similar to the rock samples for the floor;

- (2) Testing (as-necessary) 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 U.P.D.E.S. 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).

731.122 Surface-Water Quantity Surface water quantity and flow rates will be protected as described in Section 731.

731.200 Water Monitoring The water monitoring program has been implemented since July, 2000. Baseline data has been collected from both surface and groundwater monitoring sites. These sites established the current baseline data set that has been approved by the Division as representing the current surface and groundwater conditions.

Preceding each five year permit renewal, ground (springs) and surface waters will be sampled for baseline parameters, same as listed in Tables 7-4 and 7-5. Sampling of ground and surface waters will be conducted according to the operational monitoring plan, even if the monitoring has been temporarily suspended. It has been determined that minimal monitoring is required based on the anticipated impacts and no appropriated surface water use downstream.

731.210 Ground-Water Monitoring The ground-water monitoring plan is based on results of the Baseline Study and PHC determination. Based on results of these studies, the only ground water expected to be affected in the permit area is that which has been identified as springs or seeps and that which may be expected from perched aquifers encountered by the planned mining. Since no portals are presently discharging on or adjacent to the permit area and since current mining has not encountered water, no underground water is presently available for sampling. Therefore, selected springs are sampled under the Ground Water Monitoring Plan.

If ground water is encountered in future mining, of a quantity which requires discharge, the water will be monitored in accordance with requirements of this section and a monitoring plan will be proposed at that time.

For purposes of the water monitoring program, springs and seeps are considered ground water and will be monitored as such.

731.211 Ground-Water Monitoring Plan Based on information in the PHC determination (Appendix 7-3), and as indicated above, the only ground water resources on or adjacent to the permit area that can be monitored at this time are springs and seeps. See Appendix 7-6 for a detailed description of the water monitoring locations.

There are a total of 11 ground water monitoring sites proposed for this property (see Table 7-3). Station L-5-G is

the potential mine discharge point, and will be monitored at least monthly, or as discharge occurs, in accordance with U.P.D.E.S. Permit requirements (see Table 7-4).

Stations L-7-G, L-8-G, L-9-G, L-11-G, and L-12-G are significant springs or seeps located over the area of proposed mining. These springs will be monitored on a quarterly basis for parameters listed in Table 7-5.

Station L-6-G is in the vicinity of two listed water right springs, Mont Spring and Leslie Spring. These springs are within the same small drainage, and may in fact be the same spring. Close examination of spring/seep and baseline monitoring stations show only one site in this drainage with any consistent flows - site H-18; therefore, this site was originally chosen to monitor the Mont and Leslie Springs area. However in recent years L-6-G has been dry and a new wet area upstream of L-6-G, Location L-11-G, has been added to replace site L-6-G. Sampling at L-6-G was suspended as of the First Quarter of 2003.

Monitoring site L-7-G is intended to monitor a listed site known as Cottonwood Spring. Once again, a close examination of water rights information along with spring/seep and baseline monitoring has shown only one site in this area with any consistency - site #9; therefore, this is the site chosen for monitoring of Cottonwood Spring.

L-8-G is an unnamed spring that matches Earthfax sample site 10.

L-9-G is known as Pine Spring. There are two locations that are identified as Pine Spring. These are water rights 91-2517 and 91-2539, which are part of the same water right filing. In the spring and seep inventories there has never been any flow identified in the area of 91-2517 as the site is located off of the stream channel. It is assumed that the filing for 91-2517 is a duplicate but the location is wrong. There have been numerous seep/spring notations in the local area, but the only consistent flowing site is 91-2539; this is the site that will be monitored for Pine Spring. (In a recent archeological study, the location of the site that has been monitored as L-9-G was determined using GPS coordinates. The location for this site was determined to be

different than what was plotted on the Plates 7-1, 7-1A, and 7-3. Based on this new data, the location of the spring has been updated.)

L-10-G is also an unnamed spring that matches Earthfax sample site 14. Since this site is located over 1 mile south of the permit area, it has been replaced with L-12-G which is a more appropriate site to monitor. Monitoring of site L-10-G was suspended as of the First Quarter of 2003.

L-11-G is located in the bottom of the upper reaches of Lila Canyon. This is in the same drainage as the Mont and Leslie Springs water right locations. In recent years L-6-G (H-18) has been dry. However, there has been some minimum flow observed approximately one hundred yards above L-6-G where L-11-G was established.

L-12-G is an unnamed spring which had been developed but is now abandoned.

L-13-S, L-14-S, L-15-S, and L-18-S are sites being monitored to assist in characterization of the various drainages.

L-16-G and L-17-G are seeps being monitored in Stinky Spring Canyon. These sites were not identified during baseline surveys and are believed to exist intermittently and are not always evident. These two seeps appear to be an important source of water for Bighorn sheep specifically in the early spring.

L-20-G is a seep located north of the permit boundary along a tributary to Little Park Wash. It was identified in the original spring and seep survey and will now be monitored.

It should be noted that data has been gathered on the various seeps/springs as part of the original baseline inventory for the South Lease by I.P.A. The data was gathered over the years 1993, 1994 and 1995 and was stopped. In the second quarter of 2001 water monitoring continued.

The seep/spring inventory data is shown in Appendix 7-1 and locations are shown on Plate 7-1. Proposed water monitoring sites are shown on Plate 7-4.

IPA-1, -2 and -3 are groundwater piezometers in the Little Park Wash area. These holes will be checked quarterly for water depth only. Monitoring of these sites will continue until the mining or subsidence renders them unusable.

At a minimum, total dissolved solids or specific conductance corrected to 25 degrees C, pH, total iron, total manganese and water levels will be monitored, on all points except IPA-1, -2 and -3.

731.212 Monitoring Reports During periods of active monitoring, 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.

731.213 Waiver of Monitoring N/A - No waiver is requested.

731.214 Ground-Water Monitoring Duration Ground-water monitoring will continue through mining and reclamation until bond release.

The Division may approved modifications to the monitoring plan if, based on the monitoring data, it finds:

731.214.1 “The coal mining and reclamation 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,

731.214.2 until “Monitoring is no longer necessary to achieve the purposes set forth in the monitoring plan approved under R645-301-731.211.”

Therefore, UEI requests that the ground water monitoring plan be modified as follows:

One spring to the north of the northern edge of the permit boundary named Quaker Spring, will be monitored for two years to develop a baseline data set. It will be designated as L-20-G. Following the baseline data collection its monitoring will follow the operational monitoring schedule for the upper springs (shown on Table 7-3).

As baseline for the ground water conditions has been described by the monitoring to date for the Lila Canyon permit area, UEI will discontinue monitoring of the monitoring well water levels until mining intercepts the projected regional piezometric surface, as shown on Plate 7-1, and the springs and seeps until just before second mining takes place within the mine permit area. If mining encounters the regional piezometric surface, then water level monitoring will be resumed. Two years before second mining is anticipated to enter into an area that could affect the surface waters, then monitoring of the wells and springs and seeps will resume and the data compared with the baseline. All surface water monitoring will not start at the same time. Monitoring will resume as the second mining enters an area where the mining could affect the surface waters.

UEI recognizes the Division’s concerns for springs, L-G-16 and L-G-17, located at the top of the Mancos Shale, below the escarpment. While concerns of the use of these springs for wildlife have been suggested, UEI does not believe that the wildlife are using these waters. The TDS values have been excessive which are believed to limit or preclude the use of this water by wildlife. At the Division’s request, these sampling sites will continue to be monitored, while additional evaluation of wildlife use is made.

The existing baseline data shows the current ground water conditions for the permit area. No significant groundwater impacts have been identified from current first mining activities. Continuous additional monitoring will only

unnecessarily duplicate costs for data that has already been collected.

Also, it is desired that the monitoring during the first quarter not be continued. During the data collection period, there have been few first quarter periods when it was feasible to gain access to the upper elevations of the Book Cliffs and when access was available to the top during these periods, the snow cover in the canyons prevented access to the spring locations and the springs which were accessed were frozen. Therefore, it would be realistic to recognize the existing field conditions and adjust the monitoring plan accordingly.

The monitoring plan would be modified to require monitoring during the spring, summer and fall quarters.

731.215 Monitoring Equipment 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 when no longer needed.

731.220 Surface Water Monitoring Surface water monitoring will be conducted in accordance with the plan described in this section.

Based on results of the PHC determination, baseline study and other available information, numerous small springs and seeps exist within, and adjacent to, the permit area. In addition, ephemeral drainages in the area flow in response to snow melt and precipitation events. The proposed surface water monitoring program will monitor the significant surface water sources, including drainages above and below the disturbed mine site area, and all point-source discharges (i.e. sediment pond). Seeps, springs and potential mine water discharge will be monitored in accordance with the Ground Water Monitoring Plan in the previous section.

It should be noted that field sheets in Appendix 7-2 refer to a point HC-2, while Bar Graphs and Spreadsheets refer to a station B-1. It has been determined that these are the same point. The site is designated B-1 on Plate 7-1, with a red HC-2 in parenthesis. The electronic data inventory (EDI) also shows both B-1 and HC-2 designations for this site.

Another HC-2 site is listed in the seep/spring inventories in Appendix 7-6 and in the baseline data in Appendix 7-1. This station is also occasionally referred to as H-2 in the seep/spring inventories (Appendix 7-6). It has been determined that the H-2 and HC-2 sites referred to in these two appendices are the same station. The station location is shown on Plate 7-1, where it is designated H-2 with a green (HC-2) in parentheses.

There is one other station with confusing designations in the data from Appendix 7-2 and 7-6 - station HCSW-1. This station has 3 different designations in the data - HCSW-1, HSW-1, and HC-1. The point is shown as HC-1 on Plates 7-1 and 7-4; however, a note has been added to Plate 7-1 to show the station is also called (HCSW-1), to eliminate confusion. It should also be noted that there is a seep/spring site designated as H-1 on Plate 7-1. This is not to be confused with any of the above listed HC, HSW or HCSW sites.

These are the only known duplication or wrong designation of sample site numbers. It appears that different samplers or companies conducting seep/spring inventories occasionally used different designations for the same sites - the main problem being the use of H-# or HC-# for the same location, in some instances. Every effort has been made to refine the station identifications and locations on Plate 7-1 to reflect the sampling data provided in Appendices 7-1, 7-2 and 7-6. Wherever a site has 2 different designations, both are shown with one in parentheses.

Table 7-3 presents a list of proposed surface water monitoring sites. Based on the two years of surface water sampling at locations CG-2, CG-3, CG-4, CG-5, CG-6, and CG-7 which characterized the drainages as Intermittent by rule with ephemeral flow or ephemeral, which matched the description of these drainages provided in the PAP, these sampling locations will no longer be sampled. Additionally, the surface water sites for these drainages are also requested to be discontinued as explained below in Section 731.224.2.

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", Table 7-4,

“Surface Water Monitoring Parameters”, and Table 7-5 “Ground Water Monitoring Parameters”.

In any active quarter, a minimum of three unsuccessful attempts will be made by using either 4 wheel drive vehicles or ATV's to access all water monitoring sites prior to reporting any site as “No Access”. However, safety and common sense will prevail while making these attempts.

Monitoring reports will be submitted to the Division at least every 3 months, within 30 days following the end of each quarter.

731.221 Surface-Water Monitoring Plan 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 751 (see Table 7-4).

731.222 Surface-Water Monitoring Parameters The surface-water monitoring parameters are shown in Table 7-4. Water monitoring locations and sample frequencies are described in Table 7-3 and on Plate 7-4 .

The 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.

731.222.1 Non-point Source Locations The parameter list in Table 7-4 provides monitoring for all parameters required by this section. The monitoring locations and frequencies described in Table 7-3 show that all significant springs, seeps, impoundments and drainages that could potentially be impacted by the mining and reclamation operations will be monitored on a regular basis.

731.222.2 Point-source Discharges 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 Environmental Health for Utah Pollutant Discharge Elimination System (U.P.D.E.S.) permits. A U.P.D.E.S. discharge permit application has been submitted to the Division of Environmental Health for the proposed sediment pond and mine water for the Lila Canyon operation. Existing U.P.D.E.S. permit applications for the Lila Canyon Mine are provided in Appendix 7-5.

731.223 Reporting As indicated in Section 731.220, surface-water monitoring data will be submitted at least every 3 months during active monitoring for each monitoring location. When analysis of any surface water sample indicates non-compliance with the permit conditions, the company will promptly notify the Division and immediately take actions 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.

731.224 Duration Surface-water monitoring will continue through mining and reclamation until bond release. Locations, parameters and/or sampling frequency (other than U.P.D.E.S. discharge points) may be modified by the Division if:

731.224.1 "The operator 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"; or,

731.224.2 "Monitoring is no longer necessary to achieve the purposes set forth in the monitoring plan approved under 731.221.

Therefore, UEI requests that the surface water monitoring plan be modified as follows:

As baseline for the surface water conditions have been described by the monitoring to date for the Lila Canyon

permit area, UEI will discontinue monitoring of the surface water sites away from the surface facilities until just before second mining takes place within the mine permit area. Two years before second mining is anticipated to start, then monitoring will commence again and the data compared with the baseline.

The existing baseline data shows the current surface water conditions for the permit area. No significant surface water impacts have been identified from current first mining activities. Continuous additional monitoring will only unnecessarily duplicate costs for data that has already been collected.

As the two years of ephemeral wash characterization data have been collected and the data reflects the flow conditions as described in the surface water hydrology sections of the PAP, the sites CG-1 through CG-7 will be suspended and discontinued. Also, the upper rain gauge RS-2 will be suspended. These sites were installed and data were collected, as part of a Board Order settlement, to demonstrate that the upper drainages were ephemeral in nature and that the flow characteristics had been correctly described in the PAP.

Additionally, the sampling frequency for sites L-1-S, L-2-S, and L-3-S be changed from monthly to quarterly. As the baseline for these sites have been determined and there is no impact from the mining, reduction of the sampling frequency is justified. These sites will be sampled quarterly and flows will be recorded when they occur.

Also, it is desired that the monitoring during the first quarter not be continued. During the data collection period, there have been few first quarter periods when it was feasible to gain access to the upper elevations of the Book Cliffs and when access was available to the top during these periods, the snow cover in the canyons prevented access to the sampling locations and the sites which were accessed were either dry or frozen. Therefore, it would be realistic to recognize the existing field conditions and adjust the monitoring plan accordingly.

The monitoring plan would be modified to require monitoring during the 2nd, 3rd, and 4th quarters.

See Table 7-3 for the surface water monitoring schedule.

731.225 Monitoring Equipment 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.

731.300 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 Spill Prevention Control and Countermeasure (SPCC) Plan and by the following:

731.311 Identification/Burial of Acid- or Toxic-Forming Materials

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.

731.312 Storage of Acid- or Toxic-Forming Materials 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.

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.

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.

731.320 Storage, Burial, Treatment All storage, burial and treatment practices will be as described in this permit, and consistent with applicable material handling and disposal provisions of the R645-Rules.

731.400 Transfer of Wells There are presently three piezometers on this permit. When these piezometers are no longer required, they will be sealed in a safe, environmentally sound manner in accordance with regulations (see Section 631.200). The Horse Canyon Well has been donated to the College of Eastern Utah as part of the Post Mine Land Use Change.

731.500 Discharges The only proposed discharges from this operation will be from the sediment pond and/or underground mine water. Each of these potential discharges would be monitored and controlled within requirements of approved U.P.D.E.S. Discharge Permits.

731.510 Discharges into an Underground Mine There are no plans to discharge any water into an underground mine. This section is not applicable.

731.512 Types of Discharge The only planned discharges from this site are water, in the form of sediment pond discharge or underground mine water discharge.

731.512.1 Water See Section 731.512.

731.512.2 Coal Processing Waste N/A - There are no plans to process coal or discharge coal processing waste from this site.

731.512.3 Fly Ash from a Coal-Fired Facility N/A - There are no plans for a coal-fired facility at this time.

731.512.4 Sludge from Acid-Mine-Drainage Treatment
N/A There are no plans for an acid-mine-drainage treatment facility at this time.

Table 7-3 Lila Canyon Mine Water Monitoring Stations				
Station	Location	Type	Frequency	Remarks
L-1-S	Lila Canyon	Int. Stream	Quarterly	At mine Site
L-2-S	Rt. Fork Lila (above mine)	Ephemeral Stream	Quarterly	RF Above Mine Site
L-3-S	Lila Canyon (below mine)	Int. Stream	Quarterly	RF Below Mine Site
L-4-S	Sediment Pond	Discharge	Monthly or as occurs	Per UPDES Permit
L-5-G	Mine Water	Discharge	Monthly or as occurs	Per UPDES Permit
L-6-G	Lila Canyon	Spring	Sampling Permanently Suspended 1Qtr 2003	Replaced by L-11-G Water Right 91-617
L-7-G	Little Park	Spring	Quarterly	Cottonwood Spring Sample Site 9 Water Right 91-2521
L-8-G	Little Park	Spring	Quarterly	Unnamed Spring Sample Site 10 Water Right 91-2538
L-9-G	Little Park	Spring	Quarterly	Pine Spring Sample Site 16Z Water Right 91-2539
L-10-G	Williams Draw	Spring	Sampling Permanently Suspended 1Qtr 2003	Replaced by L-12-G Water Right 91-809

Table 7-3 Lila Canyon Mine Water Monitoring Stations				
Station	Location	Type	Frequency	Remarks
L-11-G	Lila Canyon	Spring	Quarterly	Mont/Leslie Spring Replaces L-6-G Water Right 91-618
L-12-G	Section 25 Spring	Spring	Quarterly	Replaces L-10-G
L-13-S	Little Park Wash	Dry Wash	Sampling Permanently Suspended 3Qtr 2011	At Road Crossing
L-14-S	Section 25 Noname Wash	Dry Wash	Sampling Permanently Suspended 3Qtr 2011	At Road Crossing
L-15-S	Williams Draw Wash	Dry Wash	Sampling Permanently Suspended 1Qtr of 2003	At Road Crossing
L-16-G	Stinky Spring Wash	Seep	Quarterly 2-3-4	Top of Mancos
L-17-G	Stinky Spring Wash	Seep	Quarterly 2-3-4	Top of Mancos
L-18-S	Stinky Springs Wash	Dry Wash	Sampling Temporarily Suspended 3Qtr 2011	Adjacent to Access Road
L-19-S	Little Park Wash	Dry Wash	Quarterly	At Permit Boundary

Table 7-3 Lila Canyon Mine Water Monitoring Stations				
Station	Location	Type	Frequency	Remarks
L-20-G	Quaker Spring	Seep	Sampling Permanently Suspended 3Qtr 2012	North of Permit Boundary
IPA-1	Little Park	Borehole	Quarterly	Water Level Only
IPA-2	Little Park	Borehole	Quarterly	Water Level Only
IPA-3	Little Park	Borehole	Quarterly	Water Level Only

NOTE: Sites L-13-S, L-14-S, L-15-S, L18-S, CG-2, CG-3, CG-4, CG-5, CG-6, and CG-7 were suspended following completion of wash characterization study.

Other sites temporarily suspended until two year prior to second mining influence.

Due to access concerns only the 2nd, 3rd and 4th quarters will be sampled. First quarter has been no access.

Table 7-4 Lila Canyon Mine Surface Water Monitoring Parameters Operational and Post-Mining	
Field Measurements	Reported As
Water Level or Flow	Depth, Flow
pH	Standard Units
Specific Conductivity (ohms/cm)	umhos/cm @ 25° C
Temperature	° C
Dissolved Oxygen	mg/l
Laboratory Measurements	Reported As
Total Dissolved Solids	mg/l
Total Settleable Solids	(UPDES)
Total Suspended Solids	mg/l
Total Hardness (CaCO ₃)	mg/l
Total Alkalinity	mg/l
Carbonate (CO ₃ ⁻²)	mg/l
Bicarbonate (HC ₃ ⁻¹)	mg/l
Calcium (Ca) (Dissolved)	mg/l
Chloride (Cl ⁻)	mg/l
Iron (Fe) (Dissolved)	mg/l
Iron (Fe) (Total)	mg/l
Magnesium (Mg) (Dissolved)	mg/l
Manganese (Mn) (Dissolved)	mg/l
Manganese (Mn) (Total)	mg/l
Potassium (K) (Dissolved)	mg/l
Sodium (Na) (Dissolved)	mg/l
Sulfate (SO ₄ ⁻²)	mg/l
Oil and Grease (As required)	mg/l
Cations	meq/l
Anions	meq/l

Table 7-5 Lila Canyon Mine Ground Water Monitoring Parameters Operational and Post-Mining	
Field Measurements	Reported As
Water Level or Flow	Depth, Flow
pH	Standard Units
Specific Conductivity	umhos/cm @ 25° C
Temperature	° C
Laboratory Measurements	Reported As
Total Dissolved Solids	mg/l
Total Hardness (CaCO ₃)	mg/l
Total Alkalinity	mg/l
Carbonate (CO ₃ ⁻²)	mg/l
Bicarbonate (HC ₃ ⁻¹)	mg/l
Calcium (Ca) (Dissolved)	mg/l
Chloride (Cl ⁻)	mg/l
Iron (Fe) (Dissolved)	mg/l
Iron (Fe) (Total)	mg/l
Magnesium (Mg) (Dissolved)	mg/l
Manganese (Mn) (Dissolved)	mg/l
Manganese (Mn) (Total)	mg/l
Potassium (K) (Dissolved)	mg/l
Sodium (Na) (Dissolved)	mg/l
Sulfate (SO ₄ ⁻²)	mg/l
Oil and Grease (As required)	mg/l
Cations	meq/l
Anions	meq/l

731.512.5 Flue-gas Desulfurization Sludge N/A - There are no plans for flue-gas desulfurization at this site.

731.512.6 Inert Materials N/A - There are no plans to use or discharge inert materials used for stabilizing underground mines.

731.512.7 Any underground mine development wastes that cannot be left and permanently stored underground will be brought to the surface and stored in a controlled, designated location. Final disposal of such material will depend on its volume, physical and chemical characteristics and potential for use in reclamation. There are presently no plans to return such material underground; however, if this does become necessary in the future, complete plans will be submitted for disposal at that time.

731.513 Water from Underground Workings 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. A sump is an underground storage area that is used to temporarily store water before it is used underground or pumped to the surface for discharge. The main purpose of a sump is to remove sediments. The sump will also remove oil/grease if they were to get into the water. The size of a sump can vary from a few hundred gallons to several thousand gallons. The size normally depends on the space available and the amount of water needed for mining operations.

In order to more accurately define the potential impact of the mine on ground water, underground usage discharge amounts, if they were to occur, would be documented. This information along with the surface monitoring program will provide the best information available as to the potential impact of the mine on ground water.

IPA piezometers 1-3 will still be monitored quarterly if possible. The three piezometers were monitored on December 22, 2000. The water level probe during this period was unable to reach the depth required to measure the water level of IPA-1 and IPA -3. Another attempt will be

made to enter these piezometers when the sites are accessible.

The water level of IPA-2 was very consistent with the last reading taken on April 29, 1996. This piezometer (IPA-2) is the farthest west of the three piezometers and is up dip from the other two. Any impact to ground water would be noticed very quickly at IPA-2. This information from IPA-2 along with the past baseline data on the three piezometers and the in mine water monitoring program mentioned above, would provide an accurate evaluation of potential ground water impacts.

At the present time, there are no plans to divert water from the underground workings of this operation to any other underground workings.

If it became necessary to discharge water from the mine, this water would be discharged in accordance with the UPDES permit application in Appendix 7-5. The water would be discharged into the Right Fork of Lila Canyon. Refer to Plate 7-5.

731.520 Gravity Discharges Location of the proposed portal slopes are below the western (upper) exposure of the easterly dipping coal bed. In the area immediately around the proposed portals, no water is presently issuing from the strata above or below the coal outcrop; therefore, it is assumed any water encountered in the underground mining will not be under artesian pressure or with sufficient hydrostatic head to raise it to the portal site.

The coal seam to be mined dips away from the portal site at approximately 10%. If water is encountered in the mining, it will likely be at a static level far below the exposed outcrop or rock slopes. This may result in some possible mine discharge from pumping, but not from gravity.

731.521 Portal Location The proposed access portals are below the coal outcrop, as shown on Figure 7-1, Plates 5-5 and 7-5. The ventilation breakout locations are shown on Plate 5-2. The rock slopes will slope up to the east at approximately 12% to contact the coal seam; however, the coal seam is dipping down to the east in this area. The approximate point

of contact between the rock slopes and the coal seam will be 1227' from the surface at an elevation of 6300'. Ground water levels in the mining area, based on the 3 water monitoring holes and other geologic data, appear to be nearly static at elevation 5990 in this area (see Figure 7-1).

Water level in the mine would have to raise approximately 310' to reach the rock slope/coal seam contact and result in a gravity discharge. Water monitoring results and other historical data in the area do not indicate this is likely to occur.

731.522 Surface Entries after January 21, 1981 This is not known to be an acid-producing or iron-producing coal seam; however, proposed portals are located to prevent gravity discharge from the mine (see Section 731.521).

731.600 Buffer Zones All streams within the permit area are either ephemeral or intermittent by rule with ephemeral flow. In the area of the surface facilities along the intermittent by definition Lila Wash, the Operator will install stream buffer zone signs in locations shown on Plate 5-2 and maintain the buffer zones during the operation.

731.700 Cross Sections and Maps The following is a list of cross-sections and maps provided in this section of the P.A.P.

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 7-6a	Proposed Sediment Pond #1
Plate 7-6b	Proposed Sediment Pond #2
Plate 7-7	Post-Mining Hydrology

All required maps and cross-sections have been prepared by, or under the supervision of, and certified by a Registered Professional Engineer, State of Utah.

731.710 General Area Hydrology Plate 7-1.

731.720 Plate 7-2.

731.730 Water Monitoring Map Plate 7-4.

731.740 Sediment Pond Map Plates 7-6a and 7-6b.

731.750 Plate 7-6a & b.

731.760 Other Maps (See Section 731.700 for a complete list of maps provided in this section).

731.800 Water Rights and Replacement (See Section 727)

732. Sediment Control Measures

732.100 Siltation Structures The only proposed siltation structure for this site is the sediment pond. All disturbed area runoff is proposed to be directed to this pond for final treatment prior to discharge.

The sediment pond will be constructed and maintained in compliance with applicable regulations. Details of the proposed pond are discussed in the following section and in Appendix 7-4.

732.200 Sedimentation Ponds As discussed above, all disturbed area runoff is proposed to be directed to a sediment pond for final treatment prior to any discharge. The proposed sediment pond will be located at the low point of the disturbed area, as shown on Plate 7-5.

732.210 Sediment Pond Details The proposed sediment pond is considered temporary, and will be removed during final reclamation. The pond is designed in compliance with the requirements of the following sections, as required:

356.300 - The pond will be maintained until the disturbed area has been stabilized and revegetated. Removal shall not be any sooner than 2 years after the last augmented seeding;

356.400 - Upon removal, the pond area will be reclaimed and reseeded according to the reclamation plan;

513.200 - N/A - The proposed sediment pond does not meet the size or other qualifying criteria of MSHA, 30 CFR 77.216(a);

763 - Refer to this regulation addressed later in this chapter.

Design details for the sediment pond and site drainage control are addressed in Appendix 7-4 of this P.A.P.

732.220 MSHA Requirements This section does not apply since there are no plans for construction of coal processing waste dams or embankments at this site. The proposed pond does not meet the size or other qualifying criteria of MSHA, 30 CFR 77.216(a).

732.300 Diversions There is one undisturbed diversion planned for this site. This diversion consists of a bypass culvert beneath the sediment pond, which will allow undisturbed runoff to bypass the site without mixing with disturbed area runoff.

Other diversions planned consist of disturbed area ditches and culverts, as shown on Plate 7-5. Design details for all diversions are provided in Appendix 7-4.

All diversions will be constructed and maintained to comply with the requirements of R645-301-742.100 and R645-301-742.300. Details are described under those respective sections of this chapter.

732.400 Road Drainage All roads will be constructed, maintained and reconstructed to comply with R645-301-742.400. Specific information to road drainage is provided under that section of this chapter.

732.410 Alteration or Relocation of Natural Drainages There are no plans to construct roads which will require alteration or relocation of natural drainageways, other than by providing

culverted crossings over ephemeral drainages. There are no plans to alter or relocate any intermittent or perennial drainages in conjunction with road construction.

Road construction and design details are provided in Chapter 5 of this P.A.P. Road drainage and culvert design details are provided in Appendix 7-4.

732.420 Culverts Culvert details are provided in Appendix 7-4. All undisturbed culvert inlets will be provided with headwall protection, consisting of inlet sections, rock or concrete.

733. Impoundments The only water impoundment proposed for this site is the sediment pond. Design details for the pond are provided in Appendix 7-4 and on Plates 7-6a & b.

733.100 General Plans The general plan for this site is to drain runoff from the disturbed area into a single sedimentation pond for treatment prior to discharge. Site drainage and design details are described in Appendix 7-4. The general plan includes the following, at a minimum:

733.110 Certification The sediment control plan and proposed sediment pond designs have been prepared and certified by a Registered Professional Engineer, State of Utah.

733.120 Maps and Cross Sections Sediment pond locations, design plans and cross sections are provided on Plates 7-5 and 7-6a & b, respectively.

733.130 Narrative A complete description of the proposed sediment pond along with volumes and design/construction details is provided in Appendix 7-4.

733.140 Survey The proposed sediment pond is not located within a potential subsidence area from past underground mining operations.

733.150 Hydrologic and Geologic Information Relevant hydrologic and geologic information for the sediment pond is provided in Appendix 7-4.

733.160 Certification Statement All proposed sediment pond structures are provided with this submittal. The structure will be constructed prior to construction of the mine site area, but not before receiving Division approval.

733.200 Permanent and Temporary Impoundments As indicated earlier, the proposed sediment pond is classed as temporary.

733.210 Design Requirements The proposed sediment pond is temporary; therefore, the pond is not designed to meet requirements of MSHA 30 CFR 77.216.

The proposed pond is not located where failure would expect to cause loss of life or serious property damage. As shown in Appendix 7-4, the proposed pond embankment will have a minimum of 3H : 1V on the inside slope and 2H : 1V on the outside. These slopes, along with the 95% compaction requirement, will ensure a static safety factor in excess of 1.3, as required.

733.220 Permanent Impoundment Section 733.220 is not applicable since the impoundment will be temporary.

733.230 Temporary Impoundment The proposed sediment pond is a temporary impoundment, and will be removed when reclamation sediment control and revegetation criteria are met, in accordance with Phase II Bond Release criteria.

733.240 Inspections/Potential Hazards As indicated under Section 515.200, if any examination or inspection shows a potential hazard exists, the person who examined the impoundment will promptly notify the Division of the finding and emergency procedures formatted for public protection and remedial action.

734. Discharge Structure All discharges from sedimentation ponds, diversions and culverts will be protected from erosion by the use of adequately sized rip-rap, concrete or other approved protection. Details for outlet protection for all drainage control structures are provided in appendix 7-4. All discharge structures have been designed according to standard engineering design procedures.

- 735. Disposal of Excess Spoil** No excess spoil production is anticipated.
- 736. Coal Mine Waste** Any areas designated for the disposal of coal mine waste will be constructed and maintained to comply with R645-301-746. Details are described under that section.
- 737. Noncoal Mine Waste** Storage and final disposal of noncoal mine waste are described under section 747.
- 738. Temporary Casing and Sealing of Wells** There are no wells proposed to be used to monitor ground water conditions associated with this permit or operation. The three Piezometers will be reclaimed according to the requirements of the Divisions's Performance Standards.
- 740. Design Criteria and Plans** Design criteria and plans for this permit are detailed in Appendix 7-4. The following section will describe the general drainage and sediment control plan.
- 741. General Requirements** The proposed operation is an underground mine with a relatively small surface disturbance for transportation, support and coal handling facilities. The proposed surface facilities will comprise a disturbed perimeter of approximately 42.6 acres. Access roads and utility lines will consist of approximately 10 acres of additional disturbance along a BLM Right-of-Way designated as a "Transportation Corridor".
- The majority of undisturbed runoff from areas above the proposed mine site will be diverted beneath the site via an undisturbed diversion culvert. Runoff from the disturbed mine site area will be directed to a sediment pond, designed to contain and treat the runoff from a 10 year - 24 hour precipitation event for the contributing watershed. Disturbed area runoff will be directed to the sediment pond via a combination of properly sized ditches and culverts. The general drainage control plan for the mine site is shown on Plate 7-5. The complete Drainage Design and Control Plan is provided in Appendix 7-4 of this P.A.P.
- 742. Sediment Control Measures** See Appendix 7-4 for Sediment Control Measure details.

742.100 General Requirements

742.110 Designed/Constructed/Maintained Appropriate sediment control measures will be designed, constructed and maintained using the best technology currently available to:

742.111 “Prevent, to the extent possible, additional contributions of sediment to stream flow or to runoff outside the permit area;”

This will be accomplished by the construction of undisturbed diversions to allow most undisturbed runoff to by-pass the site and by routing all disturbed runoff to sediment ponds for treatment prior to discharge.

742.112 “Meet the effluent limitations under R645-301-751;”

Any discharge from the sediment ponds 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.

742.113 “Minimize erosion to the extent possible:” This will be accomplished by proper routing of drainage, and by the use of energy dissipators and/or erosion protection at all sediment pond, ditch and culvert outlets and in ditches where erosive velocities are expected.

742.120 Sediment Control Measure Sediment control measures within and adjacent to the disturbed areas are detailed in Appendix 7-4. These measures include, but are not limited to:

742.121 As discussed in Appendix 7-4, runoff from the disturbed area will be captured in sediment ponds and/or treated as necessary to meet effluent limitations prior to discharge.

742.122 As discussed in Appendix 7-4, the majority of undisturbed drainage from above the mine site will be diverted via designed undisturbed diversions.

742.123 Undisturbed diversions will consist of properly designed and protected channels and/or culverts as described in Appendix 7-4.

742.124 The primary means of velocity reduction is planned to be the use of rip-rap; 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 Diversion approval.

742.125 There are no plans to treat runoff with chemicals. Based on extensive experience with runoff in this area, effluent requirements for discharge can normally be met by containment and settling in a sediment pond.

742.126 It is expected that water will be encountered in the underground mining; however, this water will be used for mining needs and only discharged when no further storage is available underground. Any discharge of mine water will meet applicable effluent limitations. Such water will be sampled (and treated if necessary) prior to discharge.

742.200 Siltation Structures As described in Appendix 7-4 the sediment ponds will provide for sediment removal for most of the surface facility disturbance. An alternate sediment control method of berms and silt fences will be used at the ventilation breakouts, around the topsoil stockpile area, and on the slopes below the water treatment area and portal access road. The description of this alternate sediment control method is also described in Appendix 7-4. In the case of the ventilation breakouts, this is necessary due to its remote location and rough terrain. In the case of the water treatment slope, due to topography, there is no way to direct the runoff to the sediment basins. Other sediment structures that might be used around the surface facilities are temporary sediment traps such as straw dikes and/or catch basins.

742.210 General Requirements Siltation structures will be designed, constructed and maintained in accordance with the following regulations.

742.211 Siltation structures will be constructed using the best technology currently available to prevent additional

contributions of suspended solids and sediment to streamflow outside the permit area to the extent possible. Sediment control structures and details are discussed in Appendix 7-4.

742.212 The siltation structures (i.e. sediment ponds) will be constructed prior to any coal mining and reclamation operations. Upon construction, the ponds and any other siltation structures will be certified by a qualified registered professional engineer to be constructed as designed and approved in the reclamation plan.

742.213 The sediment ponds will be designed, constructed and maintained in accordance with all applicable regulations. See 732.200, 733.200 and Appendix 7-4 for details.

742.214 Any discharge of water from underground workings to surface waters will meet applicable effluent limitations of 751. If such water is found not to meet those requirements, the water will be treated underground prior to discharge, or passed through a siltation structure prior to leaving the permit area.

742.220 Sedimentation Ponds The sedimentation ponds will meet the following criteria:

742.221.1 The ponds will be used individually;

742.221.2 The ponds are located at the lower end of the disturbed area and out of any perennial stream (See Plate 7-5);

742.221.3 The sediment ponds will be designed, constructed and maintained to:

742.221.31 The ponds are 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.

742.221.32 The ponds are designed to provide a minimum of 24 hour retention of the runoff from a 10 year - 24 hour precipitation event.

742.221.33 The ponds are designed to contain the runoff from a 10 year - 24 hour precipitation event plus a minimum of 2 years of sediment storage.

742.221.34 A nonclogging dewatering devices are proved as described in Appendix 7-4.

742.221.35 This will be accomplished by proper design, construction and maintenance of the ponds as described in Appendix 7-4.

742.221.36 As discussed in Appendix 7-4, sediment will be removed when the level reaches the 2 year storage level. Since the pond is oversized, this leaves adequate room for storage of the design event.

742.221.37 The sediment ponds construction ensures against excessive settlement. See "Sediment Pond Construction Requirements" in Appendix 7-4.

742.221.38 Sediment ponds will be free of sod, large roots, frozen soil, and acid- or toxic-forming coal processing waste. See "Sediment Pond Construction Requirements" in Appendix 7-4.

742.221.39 The sediment ponds will be compacted properly. See "Sediment Pond Construction Requirements" in Appendix 7-4.

742.222 Sediment Ponds Meeting MSHA Criteria The proposed ponds do not meet the size or other qualifying criteria of MSHA, 30 CFR 77.216(a). Therefore, this section is not applicable.

742.223 Sediment Ponds Not Meeting MSHA Criteria As discussed in Appendix 7-4, the ponds will be equipped with principle spillway and emergency spillway culverts each

sized to safely discharge runoff from a 25 year - 6 hour precipitation event.

742.223.1 The Principle Spillway culverts and the Emergency Spillway culverts will be corrugated, metal pipe. Each one designed to carry sustained flows.

742.223.2 N/A - See 742.223.1

742.224 N/A - See 742.223.1

742.225 N/A - No exception requested.

742.225.1 N/A

742.225.2 N/A

742.230 Other Treatment Facilities No other treatment facilities are planned for this operation. Therefore, Section 742.230 is not applicable.

742.240 Exemptions No exemptions are requested at this time; however, since this is a new proposed operation, the need for Small Area Exemptions and/or Alternate Sediment Control Areas may arise in the future.

742.300 Diversions

742.310 General Requirements

742.311 All diversions are considered temporary, and will be removed upon final reclamation.

Diversions are 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 detailed diversion designs are presented in Appendix 7-4 of this P.A.P.

742.312 See Appendix 7-4 for diversion designs.

742.313 As indicated, all diversions for the Lila Canyon Mine are temporary, and will be removed when no longer needed. Land disturbed by removal will be reclaimed in accordance with R645-301 and R645-302. Prior to diversion removal, downstream water treatment facilities will be modified or removed. See Reclamation Hydrology Section of Appendix 7-4.

742.320 Diversion of Perennial and Intermittent Steams

Section 742.320 is not applicable since there are no diversions planned for perennial or intermittent streams within the permit area.

742.330 Diversion of Miscellaneous Flows All diversions within the permit area are of miscellaneous flows.

742.331 Certain miscellaneous undisturbed flows are proposed to be diverted around the disturbed area. Other flows are diverted within the disturbed area and to the sediment ponds, as described in Appendix 7-4.

742.332 See Appendix 7-4.

742.333 All temporary diversions are designed to safely pass the peak runoff of a 10-year 6-hour event resulting in a more robust design than the required 2-year 6-hour precipitation event. See Appendix 7-4 for details.

742.400 Road Drainage

742.410 All Roads All roads are designed in accordance with requirements of 534. Drainage control for all roads is discussed in detail in Appendix 7-4. No part of any road is planned to be located in the channel of an intermittent or perennial stream. As shown on Plate 7-2, roads are located to minimize downstream sedimentation and flooding.

742.420 Primary Roads Primary road design is discussed under 534.

742.421 As described in Section 534, all primary roads are to be located, insofar as practical, on the most stable available surfaces.

742.422 There are no stream fords planned for this operation.

742.423 Drainage Control Road drainage control is discussed in Appendix 7-4.

742.423.1 Primary roads will be equipped with adequate drainage control, including ditches, culverts and relief drains. The drainage control system is designed, and will be constructed and maintained, to pass the peak runoff safely from a 10 year - 6 hour precipitation event, as described in Appendix 7-4.

742.423.2 Culvert design and installation details are described in Appendix 7-4. Inlets and outlets are protected from erosion. Undisturbed culvert inlets are to be equipped with trash racks.

742.423.3 Drainage ditch design details are provided in Appendix 7-4.

742.423.4 There are plans to alter the drainage channel on the south boundary of the disturbed area. This drainage is an ephemeral channel with no riparian habitat. A stream alteration permit will not be required for this channel. A 60 inch culvert and a sedimentation pond will be placed in this channel. Installation of this culvert and sedimentation control plans are described in Appendix 7-4. To ensure that state of the art technology is incorporated, the final reclamation plans for the sedimentation pond area will be submitted prior to commencement of final reclamation of this area.

742.423.5 Stream channel crossings will be provided by culverts designed, constructed and maintained using current, prudent engineering practice, as described in Appendix 7-4.

743. Impoundments

743.100 General Requirements All impoundments associated with this operation are considered temporary.

743.110 Not applicable there are no impoundments planned that meet the criteria of MSHA, 30 CFR 77.216 (a).

743.120 The design of impoundments have been prepared and certified by a qualified, registered professional engineer. As described in Appendix 7-4, the proposed sediment ponds will have at least 2' of freeboard above the highest flow level in the emergency spillway, which is adequate to resist overtopping by waves and by sudden increases in storage volumes.

743.130 As described in Appendix 7-4, the sediment ponds will be equipped with a culvert riser principal spillway and a culvert riser emergency overflow sized to safely pass the runoff from a 25 year - 6 hour precipitation event.

743.131 The principal spillway design is discussed below.

743.131.1 The principle spillway will be constructed of corrugated metal pipe. The emergency spillway will also be constructed of corrugated metal pipe.

744. Discharge Structures

744.100 The sediment ponds emergency spillway will be a vertical corrugated metal pipe. For Sediment Pond 1, it will flow into the UC-1 C.M.P. beneath the pond and discharge onto an engineered rip-rap apron to prevent scouring or erosion. For Sediment Pond 2, the discharge will be via C.M.P. (See Appendix 7-4).

Diversions and culvert outlets that are expected to have flow velocities in excess of 5 fps will also be equipped with erosion and velocity controls as described in Appendix 7-4.

744.200 Discharge structures have been designed and certified according to standard engineering design procedures. (See Appendix 7-4).

745. Disposal of Excess Spoil Section 745 is not applicable since there are no plans for disposal of excess spoil at the Lila Canyon operation.

746. Coal Mine Waste The area designated for coal mine waste disposal is within an existing depression area which is located beneath and around the proposed coal storage pile area as shown on Plates 5-2, 7-2 and 7-5. This disposal area will be used for disposal of the rock slope material, reject from coal processing, coal contaminated waste from the mine (i.e. roof falls, etc.) and/or sediment pond waste.

The designated waste area will be within the disturbed area and drained to the sediment pond, and will be constructed according to Division and MSHA requirements. Coal mine waste disposal is discussed in detail under Section 536 of this permit.

746.100 General Requirements

746.110 All coal mine waste will be placed in a new disposal area within the permit area as discussed in Section 536 and 746.

746.120 The area selected for coal mine waste disposal will drain to the sediment pond for final treatment to minimize adverse effects on the surface and ground water quality and quantity. (See Plates 7-2 and 7-5).

746.200 Refuse Piles. The refuse area is described under Coal Mine Waste in Section 746 and detailed in Section 536. Rock slope material will be used as fill and is referred to as refuse. No coal refuse pile is anticipated. Other than described in Section 536.

746.210 In the event a refuse pile is needed for future operations the refuse piles would be designed to meet the requirements of the above listed Division regulations as well as applicable MSHA regulations. See Section 536 for details.

746.211 The coal mine waste disposal areas will not be located in an area containing springs, seeps or water courses. As shown on Plates 5-2 and 7-5 and described in Appendix 7-4, runoff from the areas will be drained to the sediment pond.

746.212 As described in Sections 536 and 746, the coal refuse will be placed within the mine workings, rock slope material will be placed in existing depression areas. These areas are below grade and will drain to the sediment pond. Due to the location (below grade) no berms or diversion ditches are planned for the Coal Mine Waste Area. See Appendix 7-4 for hydrologic details.

746.213 Not applicable since there are no underdrains planned for this pile.

746.220 Surface Area Stabilization

746.221 The plan for revegetation of the area is discussed in Section 536.

746.222 There are no plans for any permanent impoundments on the refuse or Coal mine waste area. Small depressions may exist for a short time until regrading is completed. These depressions are normally less than one foot in depth and not left for more than 30 days.

746.300 This section is not applicable since there are no plans to construct any impounding structures of coal mine waste or to impound coal mine waste.

746.400 This section is not applicable since there are no plans to return coal processing waste to abandoned underground workings.

747. Disposal of Noncoal Waste. Disposal of non-coal mine waste is discussed under Section 528.330 of this permit.

747.100 As indicated in Section 528.330, non-coal mine waste will be stored in a controlled manner in a designated area on site. Final disposal of all noncoal mine waste , except concrete during reclamation, will be in a state-approved solid waste disposal area (E.C.D.C.).

747.200 As shown on Plates 5-2B and 7-5, the proposed noncoal mine waste storage area is in a designated site, free of springs or seeps, and drained to the sediment pond.

747.300 There are no plans to dispose of noncoal mine waste within the permit area, except concrete during reclamation. The concrete will be buried beneath a minimum of 2' of non-acid, non-toxic material, and will not degrade surface or ground water.

748. Casing and Sealing of Wells There are only three ground water piezometers on the site IPA-1, IPA-2 and IPA-3. They will be reclaimed according to the requirements of the Division's Performance Standards. If any additional wells are required in the future, requirements of this section will be met.

750. Performance Standards

751. Water Quality 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. See Sections 731 and 742.

752. Sediment Control Measures Sediment control measures will be located, maintained, constructed and reclaimed according to plans and designs described under Sections 732, 742, 760 and Appendix 7-4.

752.100 Siltation Structures Siltation structures and diversions will be located, maintained, constructed and reclaimed according to plans and designs described under Sections 732, 742, 763 and Appendix 7-4.

752.200 Road Drainage Roads will be located, designed, constructed, reconstructed, used, maintained and reclaimed as described under Sections 732.400, 742.400 and 762.

752.210 Control or Prevent Erosion See Section 742.400 and Appendix 7-4.

752.220 Control or Prevent Additional Disturbance See Section 742.400 and Appendix 7-4.

752.230 Effluent Standards See Section 742.400 and Appendix 7-4.

752.240 Degradation of Ground Water Systems See Section 742.400 and Appendix 7-4.

752.250 Altering Normal Flow of Water See Section 742.400 and Appendix 7-4.

753. Impoundments and Discharge Structures Impoundments and discharge structures will be located, maintained, constructed and reclaimed as described in Sections 733, 734, 743, 745, 760 and Appendix 7-4.

754. Disposal of Excess Spoil, Coal Mine Waste and Noncoal Mine Waste Disposal areas for excess spoil, coal mine waste and noncoal mine waste will be located, maintained, constructed and reclaimed to comply with Sections 735, 736, 745, 746, 747 and 760.

755. Casing and Sealing of Wells Not applicable since no wells are planned for this site. The three Piezometers will be reclaimed according to the requirements of the Divisions's Performance Standards.

760. Reclamation Reclamation hydrology is detailed in Appendix 7-4.

761. General Requirements Upon completion of operations, the disturbed area will be reclaimed. All drainage and sediment controls are considered temporary and will be removed when no longer required. The sediment pond will remain in place until Phase II Bond Release requirements have been met. At that time, the pond will be removed and the area will be reclaimed in accordance with the approved plan.

762. Roads All roads within the disturbed area are temporary, and will be removed and reclaimed upon completion of operations. An access road will be left in place to reach the sediment pond; however, this road will also be removed and reclaimed when the sediment pond is removed.

762.100 Upon removal of roads, culverts and diversions will also be removed and the natural drainage patterns will be restored.

762.200 Cut and fill slopes will be reshaped according to the approved reclamation plan. This reshaping will be compatible with the

postmining land use and will complement the drainage pattern of the surround terrain. Road reclamation is described in Section 550.

763. Siltation Structures. See Appendix 7-4 for details on removal of siltation structures.

763.100 Siltation Structures will be Maintained. As indicated in Section 761, the sediment pond will remain in place until the stability and vegetation requirements for Phase II Bond Release are met. This will be a minimum of 2 years after the last augmented seeding. At this time, the pond will be removed and the area reclaimed.

763.200 Structure is Removed Upon removal of the sediment pond, the area will be regraded and revegetated in accordance with the approved reclamation plan and Sections 358, 356 and 357.

764. Structure Removal A timetable for reclamation activities is provided in Section 542.100.

765. Permanent Casing and Sealing of Wells There are only three ground water piezometers on the site IPA-1, IPA-2 and IPA-3. They will be reclaimed according to the requirements of the Division's Performance Standards. If any additional wells are required in the future, requirements of this section will be met.

References

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- Waddell, K. M., Dodge, J. E., Darby, D. W., and Theobald, S. M., 1986. Hydrology of the Price River Basin, Utah, with emphasis on selected coal-field areas: U.S. Geological Survey Water-Supply Paper 2246, 51 p.

Waddell and others, 1983 (p11).

Waddell, K.M., P.K. Contrato, C.T. Sumsion, and J.R. Butler. 1981. Hydrologic Reconnaissance of the Wasatch Plateau-Book Cliffs Coal-Fields Area, Utah. U.S. Geological Survey Water-Supply Paper 2068. Washington, D.C.

Bond Amount

Direct Costs

Subtotal Demolition and Removal	\$298,193		\$335,211
Subtotal Backfill and Grading	\$337,648		
Subtotal Vegetation	\$325,470		
Subtotal Direct Costs	<u>\$961,310</u>		<u>\$998,328</u>

Indirect Costs

Mob/Demob	\$96,131	10.0%	\$99,833
Contingency	\$48,066	5.0%	\$49,916
Engineering Redesign	\$24,033	2.5%	\$24,958
Main Office Expense	\$65,369	6.8%	\$67,886
Project Management Fee	<u>\$24,033</u>	2.5%	<u>\$24,958</u>
Subtotal Indirect Costs	<u>\$257,631</u>	26.8%	<u>\$267,552</u>

SubTotal	\$1,218,942		\$1,265,880
----------	-------------	--	-------------

Total	\$1,218,942		\$1,265,880
-------	-------------	--	-------------

Escalation Factor		0.012	
Number of Years		3	
Escalation	\$43,882		\$45,572

Total	\$1,262,824		\$1,311,452
-------	-------------	--	-------------

Reclamation Cost 2018	\$1,262,824		\$1,311,452
-----------------------	-------------	--	-------------

Bond Amount (rounded to nearest \$1,000)	\$1,263,000		\$1,311,000
--	-------------	--	-------------

Lila Canyon Mine

Appendix 5-9

Graben Breakout



APPENDIX 5-9
GRABEN BREAKOUT

Index

Description and Narrative

Attachments:

Figure 1	Representative Breakout Portals
Figure 2	Typical Portal Sections
Figure 3	Reclaimed Slope Stability Analysis
Attachment 1	Federal Coal Lease #SL-066490
Attachment 2	Latest Approved R2P2 Map
Attachment 3	2016 Raptor Survey Results
Attachment 4	Cultural Resources Inventory Report

DESCRIPTION AND NARRATIVE

Introduction

Presently (June 2016), the ventilation system at the Lila Canyon Mine is a forced-air system, with a large fan blowing into the mine from an outcrop breakout (North Breakout) located above and slightly north of the main entry portals. The air then circulates throughout the mine to provide fresh air for the mine personnel underground. The air then exits the mine through another breakout portal (South Breakout) located above and slightly south of the main entry portals. This ventilation configuration is appropriate for the three (3) longwall panels (District 1) currently being mined north of the Entry Fault line (see Plate 5-5 of the approved MRP).

The mine is currently developing the first of several longwall panels south of the Entry Fault (see Plate 5-5). Once the longwall mining crews move to these new panels in the south, the ventilation system will no longer be suitable to provide adequate air flow for underground mine personnel. Therefore, the Lila Canyon Mine would like to mine to the coal outcrop just north of the Central Graben Fault (see Plate 5-5) with two (2) breakout portals that will be similar in form and function to the existing South Breakout portals. These new portals will be used to exhaust air that has traveled throughout the mine workings. This breakout will increase the efficiency and efficacy of the ventilation system within the mine as crews develop and mine the longwall panels south the Entry Fault (see Plate 5-5). The location of the breakout was selected due to the location and configuration of the longwall panels south of the Entry Fault (see Plate 5-5) in relation to the location of the existing blowing fan at the North Breakout. The canyon containing the breakout does not have an official name. The proposed breakout portals will be called the Graben Breakout.

The Graben Breakout will be located in Emery County, Utah in the Book Cliffs. The breakout will be located within the coal outcrop, approximately 1.8 miles south-southeast of the main entry portals of the mine. The nearest paved road, other than the haul road to the Lila Canyon Mine, is U.S. Highway 6 which is approximately 4.6 miles from the breakout site. A system of unpaved roads extends near the mouth the unnamed canyon and throughout the adjacent foothill area. Above the proposed breakout site is the Little Park Wash and unpaved roads and trails.

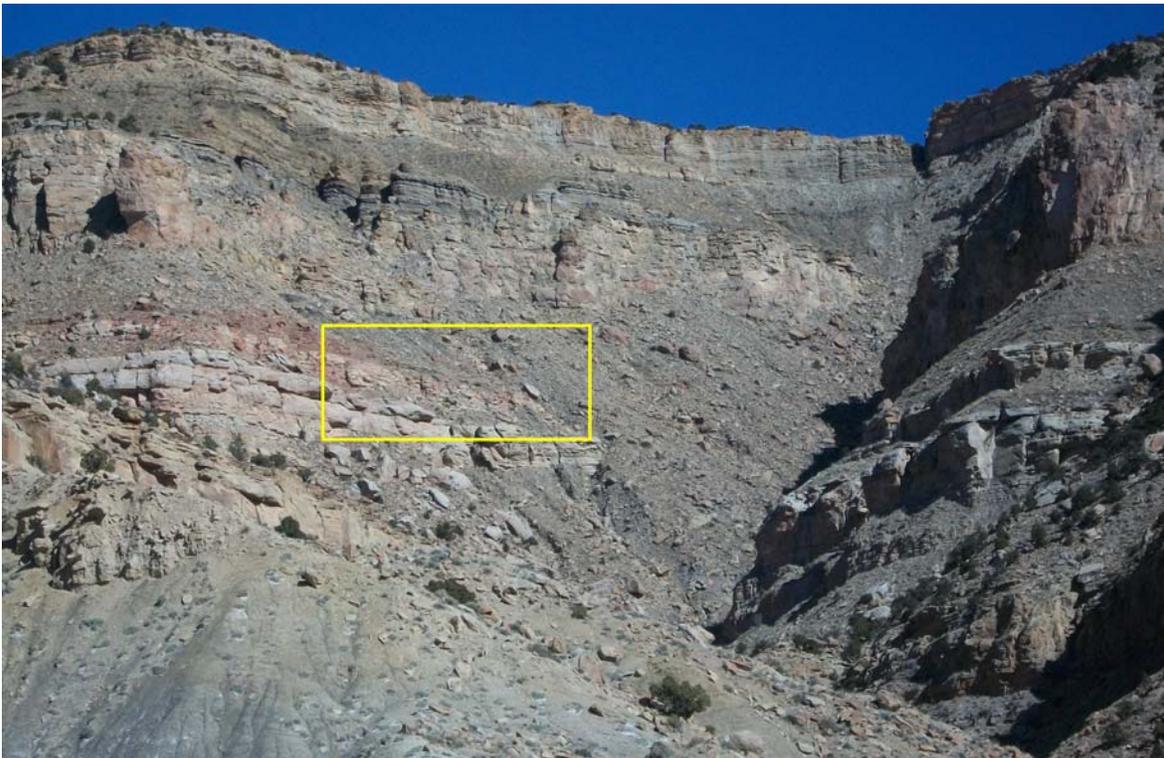
The Graben breakout itself will consist of two openings at the surface, accessed and installed completely from underground. A metal canopy will be constructed at each of the two openings, measuring approximately eighteen (18) feet wide by approximately eight (8) feet high, and extending approximately fifteen (15) feet out from the intersection of the top of the coal seam and the talus slope above the coal seam. The actual size of the canopies may vary due to the existence of burnt coal at the site and other unknown geologic conditions that may be encountered. All work to create and maintain these openings will be performed from the underground mine workings. The breakout will *not* require any new surface roads, pads or electrical lines. All access for maintenance and monitoring will be from the underground workings. The entire surface disturbance will be approximately 800 square feet (0.02 acres) total for both portals. The Graben Breakout will be very similar to the existing South Breakout in both form and function.

Chapter 1: Legal

The Graben Breakout site is located on land owned by the Bureau of Land Management (BLM) within the northwest quarter of the northeast quarter of Section 26, T.16S., R.14E., SLBM, as shown in the revised MRP drawings associated with the Incidental Boundary Change request submitted with this Appendix. UtahAmerican Energy has the right of entry for this breakout through the active Federal Coal Lease #SL-066490. The establishment and operation of the breakout are authorized by the BLM through an approved Resource Recovery and Protection Plan (R2P2). See Attachment 1 for a copy of the lease agreement. The area that includes the breakout site has been highlighted. See Attachment 2 for the latest approved R2P2 map showing the breakout.

Chapter 2: Soils

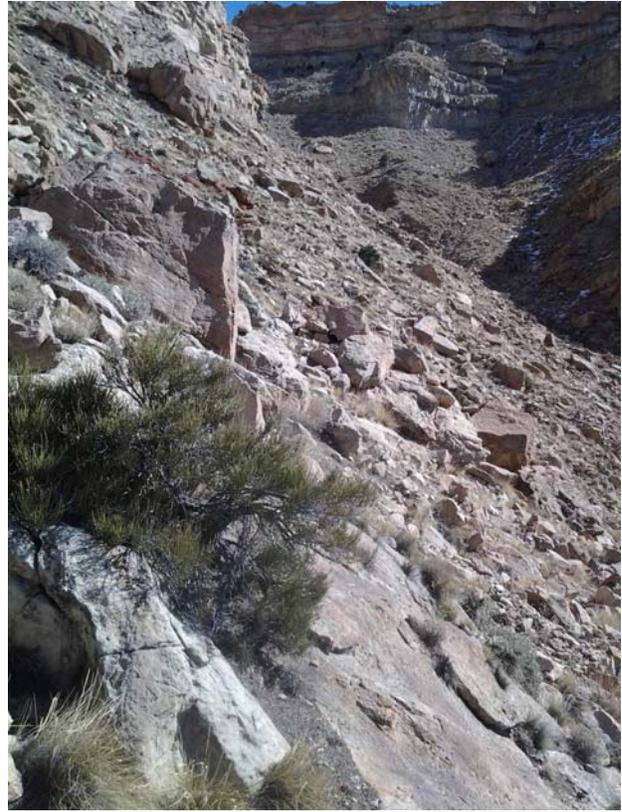
The soil in the area of the breakout is classified as RZH (Rock outcrop-Atchee-Rubbleland Complex) in the Soil Survey of the Emery Area, Utah by the Natural Resource Conservation Services. See Appendix 2-2 of the approved MRP for a description of this soil classification. The breakout area will be on a talus slope between the Sunnyside Sandstone and Grassy Sandstone. The existing slope of the area varies from approximately 65% and above.



Photograph 1: Looking east from the mouth of the unnamed canyon. The approximate area of the Graben Breakout is boxed in yellow.



Photograph 2: Looking north along the outcrop from the approximate breakout site.



Photograph 3: Looking south along the outcrop from the approximate breakout site.

As access to the ventilation breakouts will be from inside the mine, similarly to the existing South Breakouts. Topsoil from the proposed ventilation breakout sites at the coal outcrop will not be salvaged in accordance with Sections 232.100 and 234.100 regarding ventilation breakouts of the approved MRP. As a result of the very limited ground disturbance, and lack of access, topsoil cannot be reasonably salvaged. One hundred seventy five (175) cubic yards of subsoil will be salvaged at each opening, and will be stored within the mine for future sealing and reclamation.

The location of the breakouts is not in an alluvial valley floor.

Chapter 3: Biology

The Graben Breakout will be located at an elevation of approximately 6200' above sea level on an existing talus slope. The area is a year-round habitat for Rocky Mountain Bighorn Sheep and Mule Deer. The dominant vegetative community in the area is Salt Desert Shale/Grass.

To date, no raptor nests have been reported in the proposed area of the Graben Breakout. See

Appendix 3-5 for previous raptor surveys. Subsequent surveys have not reported any nesting sites in the proposed area of the breakout.

The unnamed canyon area was surveyed in May 2016. The results of said survey are provided as Attachment 3.

A physical barrier will be installed on the metal canopies, such as chain-link fencing, which will still allow air flow. This barrier is intended to prevent wildlife from entering the mine workings.

Due to the relatively small disturbance area, the Graben Breakout is not expected to impact any threatened, endangered or candidate species.

Due to the relatively small disturbance area, wildlife enhancement is not practical for this project. The Permittee will contact the Division and the Department of Wildlife Resources in the event that water is discharged from the Graben Breakout in appreciable amounts that could be beneficial for wildlife.

Reclamation of the Graben Breakout will be according to and along with the approved reclamation timeline in section 341.000 of the approved MRP. Reclamation will begin as soon as possible, once mining operations cease or the breakout is no longer needed for ventilation. Reclamation of the breakout will be completed within one year of commencement.

On final reclamation, salvaged original subsoil will be pushed from underground into the portal opening to a depth of twenty-five feet (see attached Figure 2). Concrete block seals will then be constructed in each portal per Section 529.000 and Appendix 5-6 of the approved MRP. Crews will then smooth the subsoil at the mouth of the openings by hand from the surface to the approximate original contours (AOC), with a maximum slope of two horizontal units to one vertical unit. The appropriate seed mix will then be broadcast by hand from the surface at the rate specified in the approved MRP.

Chapter 4: Land Use/Air Quality

The Graben Breakout site is located in an unnamed canyon of the Book Cliffs, approximately 4.6 miles from U.S. Highway 6. The area is undeveloped and supports wildlife and livestock grazing, falling within the Cove Grazing Allotment.

The present land use supports wildlife and livestock grazing. No change in grazing activity is expected during the operation of the mine due to the relatively small size of the breakout. The present land use will not change upon reclamation.

A Cultural Resource Inventory was conducted by Montgomery Archaeological Consultants in March 2016. The inventory did not find any cultural resources. The full report is included in this Appendix as Attachment 4.

No public parks or historic places are within the proposed disturbed area.

No prime farmland is within the proposed disturbed area.

The Graben Breakout is covered under Lila Canyon Mine's existing Air Quality Permit (#DAQE-AN0121850002-08), which needs no modification for this project.

Chapter 5: Engineering

As depicted on Plate 5-2A of the approved MRP, and Figure 1 of this Appendix, the Graben Breakout will consist of two (2) openings at the surface. Each portal canopy will measure approximately eighteen (18) feet wide by eight (8) feet high, and extend approximately fifteen (15) feet from the intersection of the talus slope and top of the coal seam. The actual size of the canopies may vary due to the existence of burnt coal at the site and other unknown geologic conditions that may be encountered during the mining process. An as-built drawing will be submitted once construction of the portals is complete.

The openings will be driven from the underground workings of the mine, thus requiring no new surface roads or pads. All electrical or other utility needs will be provided from the underground mine workings. The breakout will be used to exhaust air from the underground workings. One hundred seventy five (175) cubic yards of original salvaged subsoil from each portal will be stored within the mine to seal and reclaim the openings when sealing and reclamation is required.

Once driven, each of the openings will be protected by a metal canopy extending approximately fifteen (15) feet from the top of the coal seam intersection with the surface talus slope. This canopy will be installed to help stabilize the opening and prevent rocks and surface drainage from entering the surface openings. The canopies will be removed at reclamation.

An earthen berm will be constructed at the edge of the floor of the openings. The berm will be approximately thirty (30) inches high and extend from one side of the opening to the other. A silt fence will be installed on the outer toe of the berm. The berm will be seeded with the appropriate seed mix, per the approved MRP, to prevent erosion. This area will become an Alternate Sediment Control Area (ASCA). See Section 5.1 of Appendix 7-4.

Reclamation of the breakout has been described in the Chapter 3 data above.

The maximum slope of the reclaimed area will be two horizontal units to one vertical unit. This slope has a minimum factor of stability of 4.12 (see Figure 3).

Chapter 6: Geology

The Graben Breakout will be driven to the coal outcrop from within the Sunnyside Coal Seam, which is sandwiched between the Grassy Sandstone above and the Sunnyside Sandstone below. Surface observations show that the projected location of the breakout is composed mostly of burnt coal. No other surface anomalies have been identified at this time.

The coal seam dips down from the outcrop, generally to the east, at an approximate 12% slope. Please see Figure 2 of this Appendix.

Chapter 7: Hydrology

Several seeps/springs are located in the general vicinity of the proposed breakout location, including L-16-G (Little Stinky Spring) and L-17-G (Big Stinky Spring). All of these seeps/springs are located below the coal seam and will not be affected by the Graben Breakout. L-16-G and L-17-G are currently regularly sampled, and have been regularly sampled for several years.

The closest water rights to the breakout site are 91-4649 and 91-2617 (see Plate 7-3 of the approved MRP). Both are reservoir/stream rights that are each located nearly one mile away from the breakout site. Therefore, existing water rights will not be affected by the Graben Breakout.

The Graben Breakout will be located at an approximate elevation of 6200', with the coal seam sloping down approximately 12% from the outcrop (See Figure 2). According to historic data, the groundwater level in the area is at approximately 5990'. Therefore, the water levels would need to rise over 200' in order for the mine to discharge any water from the proposed breakout. Thus, water discharge from the breakout will not be a factor.

The Graben Breakout will be an ASCA area and will meet the requirements of Section 742.000 and Appendix 7-4 of the approved MRP.

The area around the Graben Breakout site is an ephemeral drainage area. No major ephemeral drainage channels are located in the vicinity of the proposed breakout site. Due to the steep grade of the talus slope, drainage patterns will not be significantly affected by the portals. The anticipated construction of the metal canopy at each portal and the projected berm will keep most, if not all precipitation and related surface drainage from entering the mine. Also, between the dip of the coal seam and the portal construction, no water should discharge from the mine.

The portals will be reclaimed as noted in the Chapter 3 section above when the mine either closes or the portals are no longer needed for the ventilation of the underground mine workings.

Chapter 8: Bonding

All unit costs herein presented are taken from the format of the presently approved Lila Canyon Mine bonding calculations. Updated bonding data is included in the submittal for the breakout and the Incidental Boundary Change for the permit area to include the Graben Breakout proposed location.

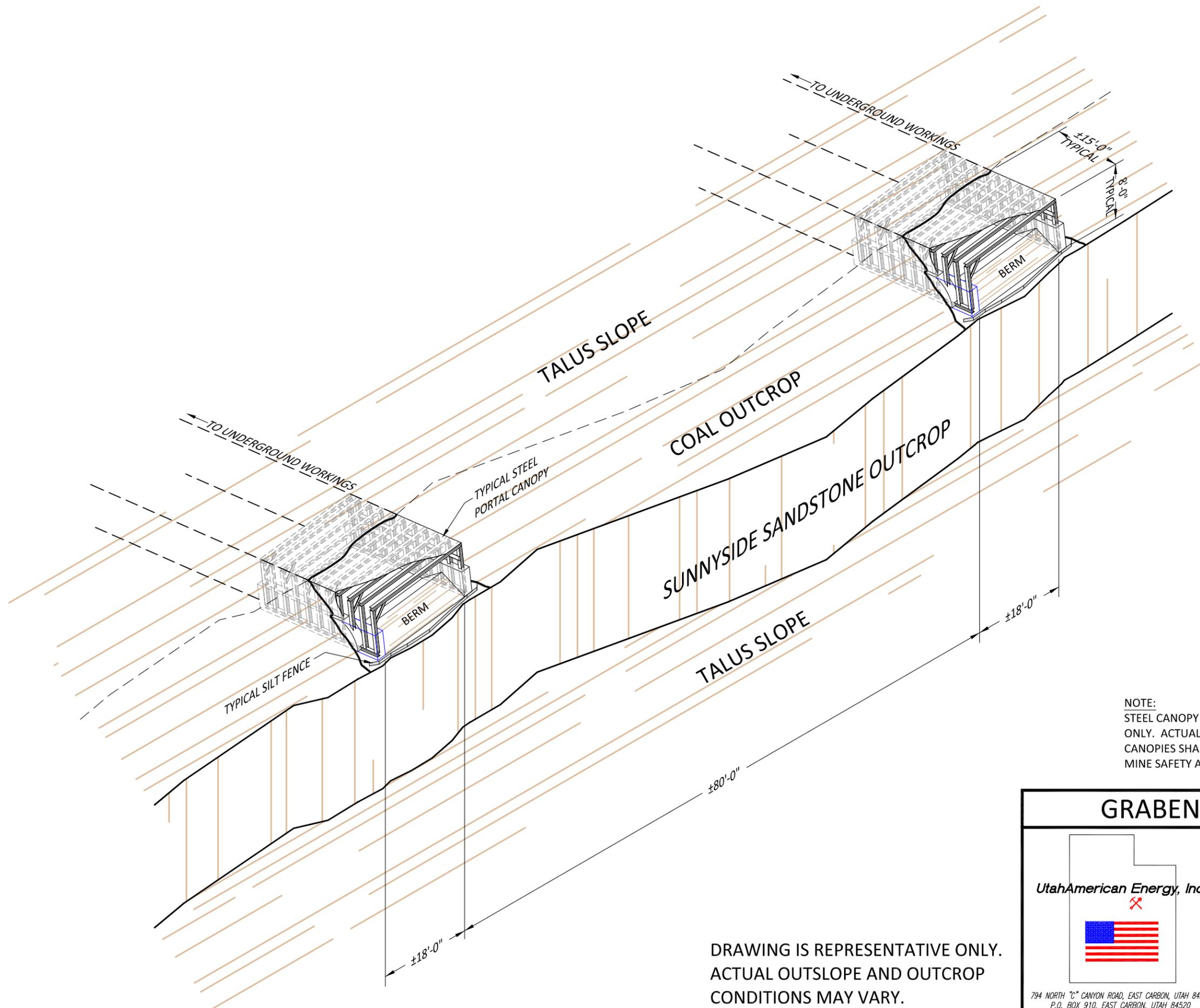
Lila Canyon Mine

Appendix 5-9

Figure 1

Representative Breakout Portals

G:\Current Drawings\MPR Maps\Lila Canyon\IBC Sect 26 Breakouts\Defickendes Task ID5081\Figure 1 -Portal Canopy.dwg, Layout1, 6/1/2016 10:43:01 AM, 1:1



NOTE:
STEEL CANOPY CONSTRUCTION IS REPRESENTATIVE ONLY. ACTUAL CONSTRUCTION MAY VARY. PORTAL CANOPIES SHALL MEET ALL REQUIREMENTS OF THE MINE SAFETY AND HEALTH ADMINISTRATION (MSHA).

DRAWING IS REPRESENTATIVE ONLY.
ACTUAL OUTSLOPE AND OUTCROP
CONDITIONS MAY VARY.

GRABEN BREAKOUT			
		REPRESENTATIVE BREAKOUT PORTALS	
		 LILA CANYON MINE 23415 North Lila Canyon Road Green River, Utah 84525 MSHA MINE ID # 42-02241	
DRAWN BY PJ	SCALE NONE	APPROVED BY DH	DATE 1 JUNE 2016
SHEET			FIGURE 1
<small>794 NORTH "C" CANYON ROAD, EAST CARBON, UTAH 84520 P.O. BOX 910, EAST CARBON, UTAH 84520 PHONE: (435) 888-4000 FAX: (435) 888-4002</small>			

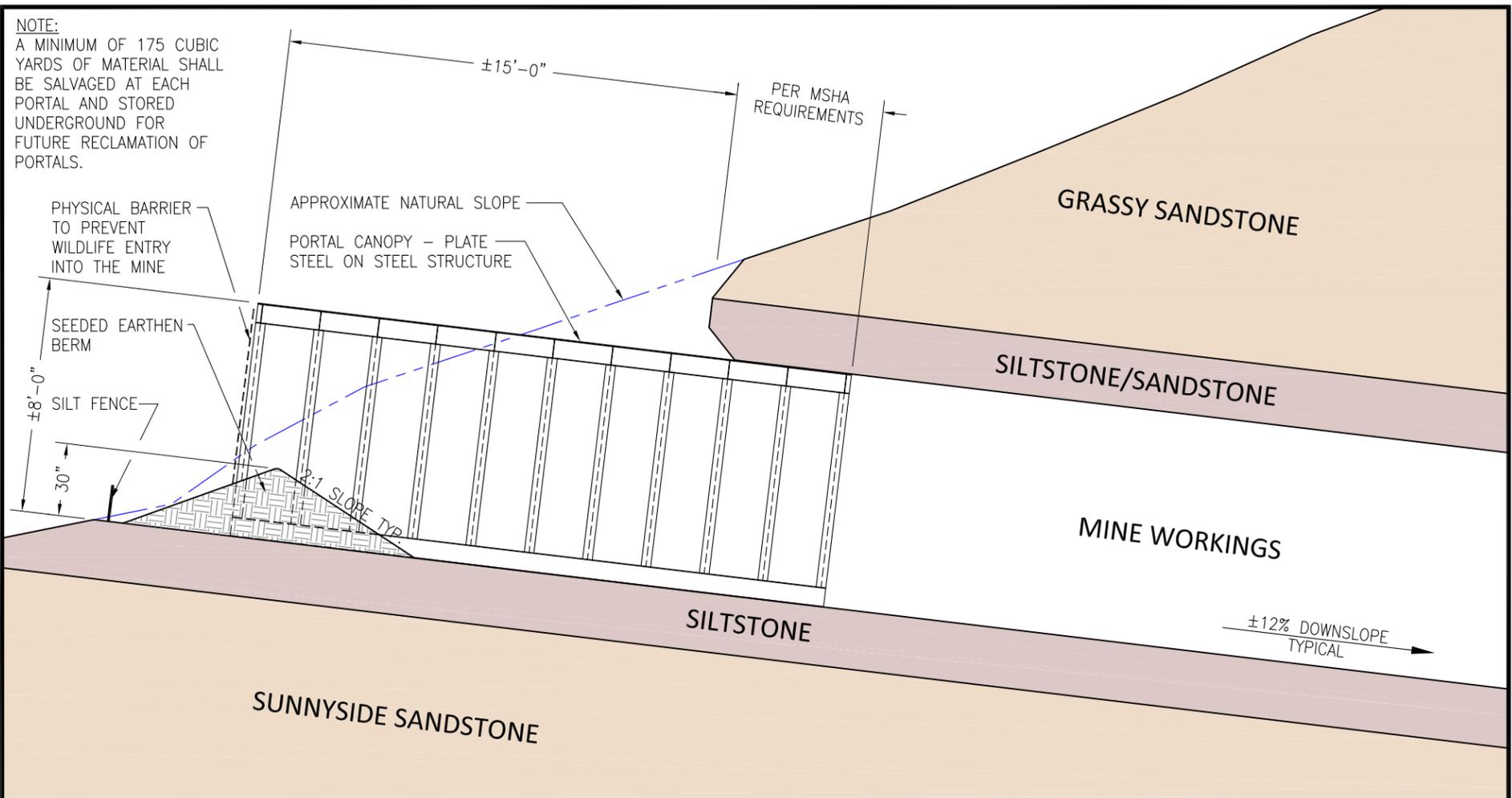
Lila Canyon Mine

Appendix 5-9

Figure 2

Typical Portal Sections

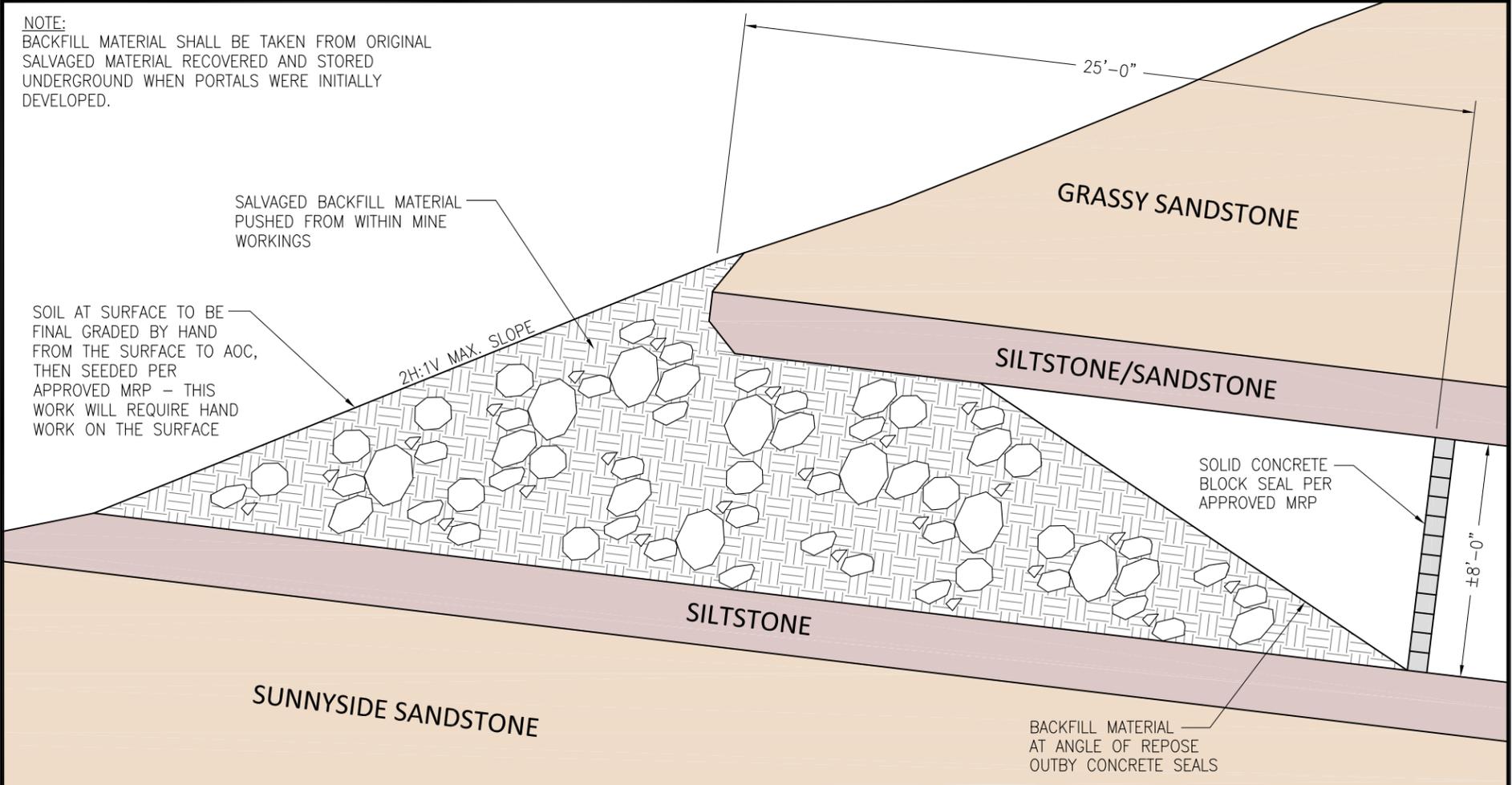
NOTE:
A MINIMUM OF 175 CUBIC YARDS OF MATERIAL SHALL BE SALVAGED AT EACH PORTAL AND STORED UNDERGROUND FOR FUTURE RECLAMATION OF PORTALS.



1 TYPICAL PORTAL SECTION DURING OPERATIONAL PHASE
FIG. 2

SCALE: NONE

NOTE:
BACKFILL MATERIAL SHALL BE TAKEN FROM ORIGINAL SALVAGED MATERIAL RECOVERED AND STORED UNDERGROUND WHEN PORTALS WERE INITIALLY DEVELOPED.



2 TYPICAL PORTAL SECTION AFTER RECLAMATION IS COMPLETE
FIG. 2

SCALE: NONE



NOTES:
1. EXISTING SLOPE SHOWN IS REPRESENTATIVE. ACTUAL SLOPES WILL BE SURVEYED AND EXISTING CONDITIONS PROVIDED WITH AS-BUILT DRAWINGS.
2. ALL UNDERGROUND MINING AND RECLAMATION SHALL MEET THE REQUIREMENTS OF THE MINE SAFETY AND HEALTH ADMINISTRATION (MSHA).
3. RECLAIM MATERIAL TO BE SANDY/ROCKY MATERIAL OF MIXED GRAIN SIZE WITH A MINIMUM ANGLE OF REPOSE OF 34° (LOWRIE, R.L., "2002 SME MINING REFERENCE HANDBOOK", UNITED STATES SOCIETY OF MINING AND METALLURGICAL EXPLORATION, PAGE 17). ACTUAL MAXIMUM SLOPE OF MATERIAL TO BE 2 HORIZONTAL UNITS TO 1 VERTICAL UNIT (26.57°). RECLAIMED SLOPE SHALL BE LESS THAN THE ANGLE OF REPOSE, THUS CREATING A STABLE SLOPE.

GRABEN BREAKOUT

UtahAmerican Energy, Inc.

794 NORTH "C" CANYON ROAD, EAST CARBON, UTAH 84520
P.O. BOX 910, EAST CARBON, UTAH 84520
PHONE: (435) 888-4000 FAX: (435) 888-4002

TYPICAL PORTAL SECTIONS	
LILA CANYON MINE	
23415 North Lila Canyon Road Green River, Utah 84525	
MSHA MINE ID # 42-02241	
DRAWN BY	PJ
APPROVED BY	DH
SCALE	NONE
DATE	1 JUNE 2016
SHEET	FIGURE 2

Lila Canyon Mine

Appendix 5-9

Figure 3

Reclaimed Slope
Stability Analysis

Graben Breakout (Worst Case Wet)									
Slice #	Hw	L	Volume	W=Vg	a°	Wsina	Wcosa	U=gLHw	Wcosa-U
	ft	ft	ft^3	lbs		lbs	lbs	lbs	lbs
1	0.44	2.00	0.88	102	0.00	0	102	28	74
2	0.88	2.00	1.76	204	1.90	7	204	57	147
3	1.60	2.00	3.20	371	6.38	41	369	103	266
4	2.17	2.00	4.34	503	10.90	95	494	140	355
5	2.58	2.00	5.16	599	15.49	160	577	166	411
6	2.82	2.00	5.64	654	20.80	232	612	182	430
7	2.88	2.00	5.76	668	25.02	283	605	185	420
8	2.73	2.00	5.46	633	30.05	317	548	176	372
9	2.37	2.00	4.74	550	35.37	318	448	153	296
10	1.74	2.80	4.87	565	43.49	389	410	157	253
S		20.8				1,842	4,370		3,024

Graben Breakout (Worst Case Dry)								
Slice #	Hw	L	Volume	W=Vg	a°	Wsina	Wcosa	U
	ft	ft	ft^3	lbs		lbs	lbs	
1	0.44	2.00	1	102	0.00	-	102	
2	0.88	2.00	2	204	1.90	6.77	204	
3	1.60	2.00	3	371	6.38	41	369	
4	2.17	2.00	4	503	10.90	95	494	
5	2.58	2.00	5	599	15.49	160	577	
6	2.82	2.00	6	654	20.80	232	612	
7	2.88	2.00	6	668	25.02	283	605	
8	2.73	2.00	5	633	30.05	317	548	
9	2.37	2.00	5	550	35.37	318	448	
10	1.74	2.80	5	565	43.49	389	410	
S		20.8				1,842	4,370	

density = 116.0 lbs/ft^3
 Soil Cohesion = c = 300 lb/ft^2
 Internal Friction angle = φ = 24

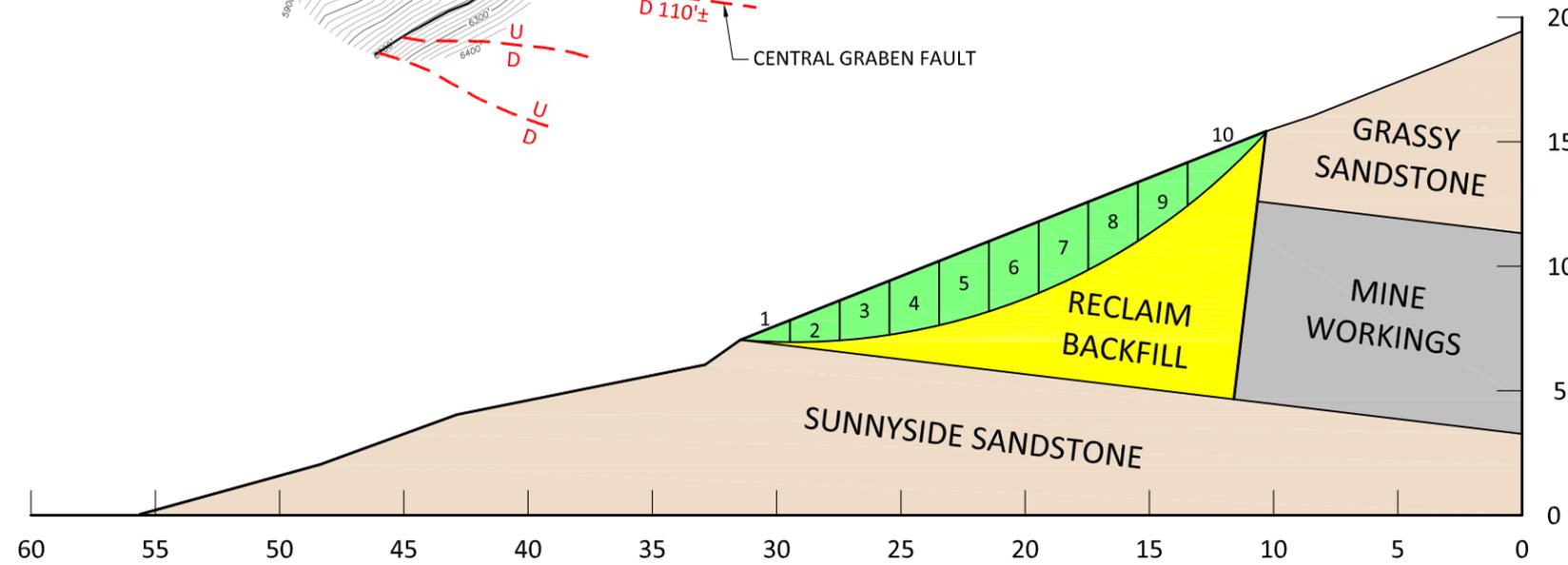
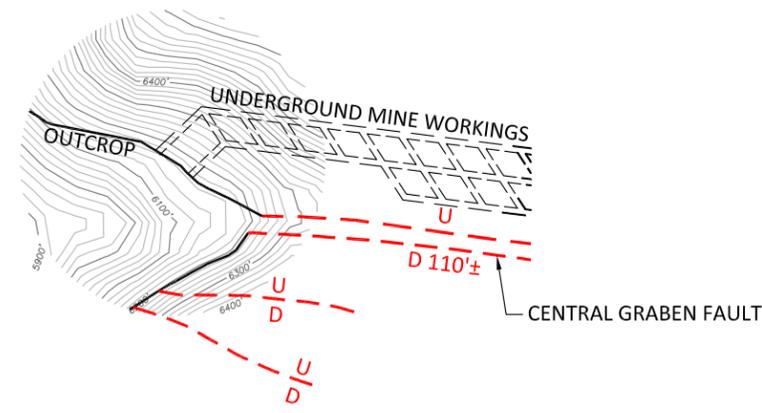
$$FS = \frac{c \sum L + (\sum W \cos \alpha - U) \tan \phi}{\sum w \sin \alpha}$$

FS = 4.12

density = 116.0 lbs/ft^3
 Soil Cohesion = c = 220 lb/ft^2
 Internal Friction angle = φ = 41

$$FS = \frac{c \sum L + (\sum W \cos \alpha) \tan \phi}{\sum w \sin \alpha}$$

FS = 4.55



References:
 Hustrulid, W. and Kuchta, M. 1995. Open Pit Mine Planning and Design. A.A. Balkema. Page 335



GRABEN BREAKOUT

RECLAIMED SLOPE STABILITY ANALYSIS

UtahAmerican Energy, Inc.

LILA CANYON MINE

23415 North Lila Canyon Road
Green River, Utah 84525

MSHA MINE ID # 42-02241

DRAWN BY	PJ	SCALE	NONE
APPROVED BY	DH	DATE	1 JUNE 2013
SHEET	FIGURE 3		

794 NORTH "C" CANYON ROAD, EAST CARBON, UTAH 84520
 P.O. BOX 910, EAST CARBON, UTAH 84520
 PHONE: (435) 888-4000 FAX: (435) 888-4002

Lila Canyon Mine

Appendix 5-9

Attachment 1

Federal Coal Lease #SL-066490

(breakout included area is highlighted)



United States Department of the Interior



BUREAU OF LAND MANAGEMENT

Utah State Office
P.O. Box 45155
Salt Lake City, UT 84145-0155
<http://www.blm.gov>

IN REPLY REFER TO:
3432
UTSL-066490
(UT-9223)

JUN 10 2011

CERTIFIED MAIL- Return Receipt Requested

UtahAmerican Energy, Inc.
794 North "C" Canyon Road
P. O. Box 910
East Carbon, UT 84520

DECISION

Coal Lease
UTSL-066490

RECEIVED
JUN 13 2011
BLM
PRICE, UT

Coal Lease UTSL-066490 Modified
Extension of Coverage of Surety Bond Accepted

Enclosed is a copy of modified coal lease UTSL-066490 effective on June 1, 2011. The terms and conditions of the original lease are made consistent with the laws, regulations, and lease terms applicable at the time of this modification. The anniversary date of the coal lease remains December 31, 1947.

On June 9, 2011 a surety rider submitted by John P. Yediny, an Attorney-in-Fact for the Rockwood Casualty Insurance Company agreed to extend the coverage of the \$120,000 lease bond to the additional modified acreage. This rider is acceptable to extend that coverage and is accepted as of the date of filing.

Please note that rental in the amount of \$3.00 per acre, or fraction thereof, or a total of \$7,335 is due on the next anniversary date, beginning with December 31, 2011.

Kent Hoffman

Kent Hoffman
Deputy State Director
Lands and Minerals

Enclosures:
Modified Coal Lease (8 pp.)

cc: Price Field Office
Mr. John Baza, Director, UDOGM, Box 145801, Salt Lake City, Utah 84114-5801
ONNR, MRM, Solid Minerals Staff, Attn: Patrick Mulcahy, MS390B2, Box 25165, Denver,
CO 80225-0165
John P. Yediny, Rockwood Casualty Insurance Company, 654 Main Street, Rockwood, PA 15557

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

Serial No. UTSL-066490

MODIFIED COAL LEASE

Date of Lease December 31, 1947

PART I.

THIS MODIFIED COAL LEASE is entered into on June 1, 2011, by and between the **UNITED STATES OF AMERICA**, hereinafter called the Lessor, through the Bureau of Land Management, and UtahAmerican Energy, Inc.
794 North "C" Canyon Road
P. O. Box 910
East Carbon, UT 84520

hereinafter called Lessee.

This modified lease shall retain the effective date of December 31, 1947, of the original **COAL LEASE UTSL- 066490**, and is effective for a period of 20 years from the date of issuance of the lease, dated December 31, 1947 and for so long thereafter as coal is produced in commercial quantities from the leased lands, subject to readjustment of lease terms next on October 26, 2015 and at the end of each 10 year lease period thereafter.

Sec. 1. This lease is issued pursuant and subject to the terms and provisions of the: (NOTE: Check the appropriate Act or Acts.)

XX Mineral Lands Leasing Act of 1920, as amended, 41 Stat. 437, 30 U.S.C. 181-287, hereinafter referred to as the Act;

 Mineral Leasing Act for Acquired Lands of 1947, 61 Stat. 913, 30 U.S.C. 351-359;

and to the regulations and formal orders of the Secretary of the Interior which are now or hereafter in force, when not inconsistent with the express and specific provisions herein.

Sec. 2. Lessee as the holder of Coal Lease UTSL- 066490, issued effective December 31, 1947, were granted the exclusive right and privilege to drill for, mine, extract, remove or otherwise process and dispose of the coal deposits in, upon, or under the lands described below as Tract 1.

The Lessor in consideration of fair market value, rents and royalties to be paid, and the conditions and covenants to be observed as herein set forth, hereby grants and leases to Lessee the exclusive right and privilege to drill for, mine, extract, remove, or otherwise process and dispose of the coal deposits in, upon, or under the lands described below as Tract 2.

Tract 1:

T. 16 S., R. 14 E., SLM, Utah
Sec. 11, E $\frac{1}{2}$;
Sec. 12, W $\frac{1}{2}$;
Sec. 13, W $\frac{1}{2}$;
Sec. 14, W $\frac{1}{2}$, SW $\frac{1}{4}$;
Sec. 15, E $\frac{1}{2}$ SE $\frac{1}{4}$;
Sec. 22, NE $\frac{1}{4}$ NE $\frac{1}{4}$;
Sec. 23, N $\frac{1}{2}$, E $\frac{1}{2}$ SW $\frac{1}{4}$, SE $\frac{1}{4}$;
Sec. 24, NW $\frac{1}{4}$, W $\frac{1}{2}$ SW $\frac{1}{4}$;
Sec. 26, N $\frac{1}{2}$ NE $\frac{1}{4}$

Tract 2:

T. 16 S., R. 14 E., SLM, Utah



containing 2,445.00 acres, more or less, together with the right to construct such works, buildings, plants, structures, equipment and appliances and the right to use such on-lease rights-of-way which may be necessary and convenient in the exercise of the rights and privileges granted, subject to the conditions herein provided.

lease in accordance with, inter alia, Section 39 of the Mineral Leasing Act, 30 U.S.C. 209.

Part II. TERMS AND CONDITIONS

Sec. 1.(a) RENTAL RATE - Lessee shall pay Lessor rental annually and in advance for each acre or fraction thereof during the continuance of the lease at the rate of \$3.00 per acre for each lease year.

(b) RENTAL CREDITS - Rental shall not be credited against either production or advance royalties for any year.

Sec. 2.(a) PRODUCTION ROYALTIES - The royalty shall be 8 percent of the value of the coal as set forth in the regulations. Royalties are due to Lessor the final day of the month succeeding the calendar month in which the royalty obligation accrues.

(b) ADVANCE ROYALTIES - Upon request by the Lessee, the authorized officer may accept, for a total of not more than 20* years, the payment of advance royalties in lieu of continued operation, consistent with the regulations. The advance royalty shall be based on a percent of the value of a minimum number of tons determined in the manner established by the advance royalty regulations in effect at the time the Lessee requests approval to pay advance royalties in lieu of continued operation.

* 20 years (Public Law 109-58)

Sec. 3. BONDS - Lessee shall maintain in the proper office a lease bond in the amount of \$120,000. The authorized officer may require an increase in this amount when additional coverage is determined appropriate.

Sec. 4. DILIGENCE - This lease has achieved diligent development, and is subject to the conditions of continued operation. Continued operation may be excused when operations under the lease are interrupted by strikes, the elements, or casualties not attributable to the Lessee. The Lessor, in the public interest, may suspend the condition of continued operation upon payment of advance royalties in accordance with the regulations in existence at the time of the suspension.

The Lessor reserves the power to assent to or order the suspension of the terms and conditions of this

Sec. 5. LOGICAL MINING UNIT (LMU) - Either upon approval by the Lessor of the Lessee's application or at the direction of the Lessor, this lease shall become an LMU or part of an LMU, subject to the provisions set forth in the regulations.

The stipulations established in an LMU approval in effect at the time of LMU approval or modification will supersede the relevant inconsistent terms of this lease so long as the lease remains committed to the LMU. If the LMU of which this lease is a part is dissolved, the lease shall then be subject to the lease terms which would have been applied if the lease had not been included in an LMU.

~~This lease was placed in the Soldier Creek LMU effective March 1, 1996.~~ ^{DK}

Sec. 6. DOCUMENTS, EVIDENCE AND INSPECTION - At such times and in such form as Lessor may prescribe, Lessee shall furnish detailed statements showing the amounts and quality of all products removed and sold from the lease, the proceeds therefrom, and the amount used for production purposes or unavoidably lost.

Lessee shall keep open at all reasonable times for the inspection of any duly authorized officer of Lessor, the leased premises and all surface and underground improvements, works, machinery, ore stockpiles, equipment, and all books, accounts, maps, and records relative to operations, surveys, or investigations on or under the leased lands.

Lessee shall allow Lessor access to and copying of documents reasonably necessary to verify Lessee compliance with terms and conditions of the lease.

While this lease remains in effect, information obtained under this section shall be closed to inspection by the public in accordance with the Freedom of Information Action (5 U.S.C. 552).

Sec. 7. DAMAGES TO PROPERTY AND CONDUCT OF OPERATIONS - Lessee shall comply at its own expense with all reasonable orders of the Secretary, respecting diligent operations, prevention of waste, and protection of other resources.

Lessee shall not conduct exploration operations, other than casual use, without an approved exploration plan. All exploration plans prior to the commencement of mining operations within an approved mining permit

area shall be submitted to the authorized officer.

Lessee shall carry on all operations in accordance with approved methods and practices as provided in the operating regulations, having due regard for the prevention of injury to life, health, or property, and prevention of waste, damage or degradation any land, air, water, cultural, biological, visual, and other resources, including mineral deposits and formations of mineral deposits not leased hereunder, and to other land uses or users. Lessee shall take measures deemed necessary by Lessor to accomplish the intent of this lease term. Such measures may include, but not limited to, modification to proposed siting or design of facilities, timing of operations, and specifications of interim and final reclamation procedures. Lessor reserves to itself the right to lease, sell, or otherwise dispose of the surface or other mineral deposits in the lands and the right to continue existing uses and to authorize future uses upon or in the leased lands, including issuing leases for mineral deposits not covered hereunder and approving easements or rights-of-way. Lessor shall condition such uses to prevent unnecessary or unreasonable interference with rights of Lessee as may be consistent with concepts of multiple use and multiple mineral development.

Sec. 8 PROTECTION OF DIVERSE INTERESTS, AND EQUAL OPPORTUNITY - Lessee shall: pay when due all taxes legally assessed and levied under the laws of the State or the United States; accord all employees complete freedom of purchase; pay all wages at least twice each month in lawful money of the United States; maintain a safe working environment in accordance with standard industry practices; restrict the workday to not more than 8 hours in any one day for underground workers, except in emergencies; and take measures necessary to protect the health and safety of the public. No person under the age of 16 years shall be employed in any mine below the surface. To the extent that laws of the State in which the lands are situated are more restrictive than the provisions in this paragraph, then the State laws apply.

Lessee will comply with all provisions of Executive Order No. 11246 of September 24, 1965, as amended, and the rules, regulations, and relevant

orders of the Secretary of Labor. Neither Lessee nor Lessee's subcontractors shall maintain segregated facilities.

Sec. 9.(a) TRANSFERS
(Check the appropriate space)

This lease may be transferred in whole or in part to any person, association or corporation qualified to hold such lease interest.

This lease may be transferred in whole or in part to another public body, or to a person who will mine the coal on behalf of, and for the use of, the public body or to a person who for the limited purpose of creating a security interest in favor of a lender agrees to be obligated to mine the coal on behalf of the public body.

This lease may only be transferred in whole or in part to another small business qualified under 13 CFR 121.

Transfers of record title, working or royalty interest must be approved in accordance with the regulations.

(b) **RELINQUISHMENTS** - The Lessee may relinquish in writing at any time all rights under this lease or any portion thereof as provided in the regulations. Upon Lessor's acceptance of the relinquishment, Lessee shall be relieved of all future obligations under the lease or the relinquished portion thereof, whichever is applicable.

Sec. 10. DELIVERY OF PREMISES, REMOVAL OF MACHINERY, EQUIPMENT, ETC. - At such times as all portions of this lease are returned to Lessor, Lessee shall deliver up to Lessor the land leased, underground timbering, and such other supports and structures necessary for the preservation of the mine workings on the leased premises or deposits and place all workings in condition for suspension or abandonment. Within 180 days thereof, Lessee shall remove from the premises all other structures, machinery, equipment, tools, and materials that it elects to or as required by the authorized officer. Any such structures, machinery, equipment, tools, and materials remaining on the leased lands beyond 180 days, or approved extension thereof, shall become the property of the Lessor, but Lessee shall either remove any or all such property or shall continue to be liable for the cost of removal and disposal in the amount actually incurred by the Lessor. If the surface is owned by third parties, Lessor shall waive the requirement for removal, provided the third parties do not object to such waiver. Lessee shall, prior to the termination of bond liability or at any other time when

required and in accordance with all applicable laws and regulations, reclaim all lands the surface of which has been disturbed, dispose of all debris or solid waste, repair the offsite and onsite damage caused by Lessee's activity or activities incidental thereto, and reclaim access roads or trails.

Sec. 11. PROCEEDINGS IN CASE OF DEFAULT -

If Lessee fails to comply with applicable laws, existing regulations, or the terms, conditions and stipulations of this lease, and the noncompliance continues for 30 days after written notice thereof, this lease shall be subject to cancellation by the Lessor only by judicial proceedings. This provision shall not be construed to prevent the exercise by Lessor of any other legal and equitable remedy, including waiver of the default. Any such remedy or waiver shall not prevent later cancellation for the same default occurring at any other time.

Sec. 12. HEIRS AND SUCCESSORS - IN-

INTEREST - Each obligation of this lease shall extend to and be binding upon, and every benefit hereof shall inure to, the heirs, executors, administrators, successors, or assigns of the respective parties hereto.

Sec. 13. INDEMNIFICATION -

Lessee shall indemnify and hold harmless the United States from any and all claims arising out of the Lessee's activities and operations under this lease.

Sec. 14. SPECIAL STATUTES -

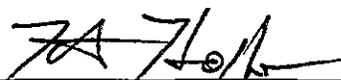
This lease is subject to the Federal Water Pollution Control Act (33 U.S.C. 1151 - 1175); the Clean Air Act (42 U.S.C. 1857 et seq.), and to all other applicable laws pertaining to exploration activities, mining operations and reclamation, including the Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1201 et seq.)

Sec. 15. SPECIAL STIPULATIONS -

SEE ATTACHED STIPULATIONS

The United States of America

BY Kent Hoffman


(Signing Officer)

Deputy State Director - Lands & Mineral
(Title)

JUN 10 2011

(Date)

Utah American Energy, Inc.
Company or Lessee Name

David W. Hilde
(Signature of Lessee)

President
(Title)

05/31/11
(Date)

Title 18 U.S.C. Section 1001, makes it a crime for any person knowingly and willfully to make to any department or agency of the United States any false, fictitious or fraudulent statements or representations as to any matter within its jurisdiction.

**SPECIAL STIPULATIONS FOR UTSL-066490
MODIFIED COAL LEASE**

1. In accordance with Sec. 523(b) of the "Surface Mining Control and Reclamation Act of 1977," surface mining and reclamation operations conducted on this lease are to conform with the requirements of this act and are subject to compliance with Office of Surface Mining regulations, or as applicable the Utah program approved under the cooperative agreement in accordance with sec. 523(c). The United States Government does not warrant that the entire tract will be susceptible to mining.

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

If cultural resources of significant scientific interest are discovered during operations under this lease, the lessee prior to disturbance shall, immediately bring them to the attention of the Authorized Officer.

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

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

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

4. Before undertaking activities that may disturb the surface of previously undisturbed leased lands, the lessee may be required to conduct a paleontological appraisal of the areas to be disturbed. The appraisal shall be conducted by a qualified paleontologist and a report prepared itemizing the findings.

A plan will then be submitted making recommendations for the protection of, or measures to be taken to mitigate impacts for identified paleontological resources.

If paleontological remains (fossils) of significant scientific interest are discovered during operations under this lease, the lessee shall immediately bring them to the attention of the authorized officer who shall evaluate, or have evaluated such discoveries and, within 5 working days, shall notify the lessee what action shall be taken with respect to such discoveries. Paleontological remains of significant scientific interest do not include leaves, ferns, or dinosaur tracks commonly encountered during underground mining.

The cost of conducting the inventory, preparing reports, and carrying out necessary protective mitigating measure shall be borne by the lessee. The cost of salvage of paleontological remains (fossils) shall be borne by the United States.

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

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

7. The lessee shall provide for the suppression and control of fugitive dust on haul roads and at coal-handling and storage

facilities on the lease area. The migration of road surfacing and subsurface materials into streams and water courses shall be prevented.

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

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

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

11. Support facilities, structures, equipment, and similar developments will be removed from the lease area within 2 years after the final termination of use of such facilities. This provision shall apply unless the requirement of Section 10 of the lease form is applicable. Disturbed areas and those areas previously occupied by such facilities will be stabilized and rehabilitated, drainages reestablished, and the areas returned to an authorized post mining land use.

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

13. Notwithstanding the approval of a Resource Recovery and Protection Plan (R2P2) by the BLM, lessor reserves the right to seek damages against the operator/lessee in the event (i) the operator/lessee fails to achieve maximum economic recovery [as defined at 43 CFR §3480.0-5(21)] of the recoverable coal reserves or (ii) the operator/lessee is determined to have caused a wasting of recoverable coal reserves. Damages shall be measured on the basis of the royalty that would have been payable on the wasted or un-recovered coal.

The parties recognize that under an approved R2P2, conditions may require a modification by the operator/lessee of that plan. In the event a coal bed or portion thereof is not to be mined or is rendered unminable by the operation, the operator shall submit appropriate justification to obtain approval by the AO to leave such reserves unmined. Upon approval by the AO, such coal beds or portions thereof shall not be subject to damages as described above. Further, nothing in this section shall prevent the operator/lessee from exercising its right to relinquish all or a portion of the lease as authorized by statute and regulation.

In the event the AO determines that the R2P2 modification will not attain MER resulting from changed conditions, the AO will give proper notice to the operator/lessee as required under applicable regulations. The AO will order a new R2P2 modification if necessary, identifying additional reserves to be mined in order to attain MER. Upon a final administrative or judicial ruling upholding such an ordered modification, any reserves left un-mined (wasted) under that plan will be subject to damages as described in the first paragraph under this section.

Subject to the right to appeal hereinafter set forth, payment of the value of the royalty on such un-mined recoverable coal reserves shall become due and payable upon determination by the AO that the coal reserves have been rendered un-minable or at such time that the lessee has demonstrated an unwillingness to extract the coal.

The BLM may enforce this provision either by issuing a written decision requiring payment of the MMS demand for such royalties, or by issuing a notice of non-compliance. A decision or notice of non-compliance issued by the lessor that payment is due under this stipulation is appealable as allowed by law.

14. **WASTE CERTIFICATION:** The lessee shall provide upon abandonment and/or sealing off a mined area and prior to lease termination/relinquishment, certification to the lessor that, based upon a complete search of all the operator's records for the mine and upon their knowledge of past operations, there has been no **hazardous substances** per (40 CFR 302.4) or **used oil** as per Utah State Management Rule R-315-15, deposited within the lease, either on the surface or underground, or that all remedial action necessary has been taken to protect human health and the environment with respect to any such substances remaining on the property. The back-up documentation to be provided shall be described by the lessor prior to the first certification and shall include all documentation applicable to the Emergency Planning and Community Right-to-know Act (EPCRA, Public Law 99-499), Title III of the Superfund Amendments and Reauthorization Act of 1986 or equivalent.

15. **ABANDONMENT OF EQUIPMENT:** The lessee/operator is responsible for compliance with reporting regarding toxic and hazardous material and substances under Federal Law and all associated amendments and regulations for the handling such materials on the land surface and in underground mine workings.

The lessee/operator must remove mine equipment and materials not needed for continued operations, roof support and mine safety from underground workings prior to abandonment of mine sections. Exceptions can be approved by the Authorized Officer (BLM) in consultation with the surface management agency. Creation of a situation that would prevent removal of such material and by retreat or abandonment of mine sections without prior authorization would be considered noncompliance with lease terms and conditions and subject to appropriate penalties under the lease.

16. **UNDERGROUND INSPECTION:** All safe and accessible areas shall be inspected prior to being sealed. The lessee shall notify the Authorized Officer in writing 30 days prior to the sealing of any areas in the mine and state the reason for closure. Prior to seals being put into place, the lessee shall inspect the area and document any equipment/machinery, hazardous substances, and used oil that is to be left underground.

The purpose of this inspection will be: (1) to provide documentation for compliance with 42 U.S.C. 9620 section 120(h) and State Management Rule R-315-15, and to assure that certification will be meaningful at the time of lease relinquishment, (2) to document the inspection with a mine map showing location of equipment/machinery (model, type of fluid, amount remaining, batteries etc.) that is proposed to be left underground. In addition, these items will be photographed at the lessee's expense and shall be submitted to the Authorized Officer as part of the certification. The abandonment of any equipment/machinery shall be on a case by case basis and shall not be accomplished unless the Authorized Officer has granted a written approval.

17. **GOB VENT BOREHOLES.** The Lessee shall submit a gob vent borehole plan for approval by the AO as part of an R2P2 for all gob vent boreholes. The plugging portion of the plan must meet 43 CFR 3484.1(a)(3) as a minimum. If variations to the approved plugging procedures are necessary, they shall also be approved by the AO in writing prior to implementation of the procedures.

18. The holder of this lease shall be required to conduct appropriate surveys for Mexican Spotted owls on the lease tract areas with 40 percent or greater slope, cliff habitat areas, riparian habitats, and mixed conifer forest habitats, prior to surface disturbing activities and or development with a potential to interrupt springs. Inventory work will be conducted by parties approved and permitted for such survey work by the Authorized Officer of the BLM and conducted following current protocols established by the USFWS.

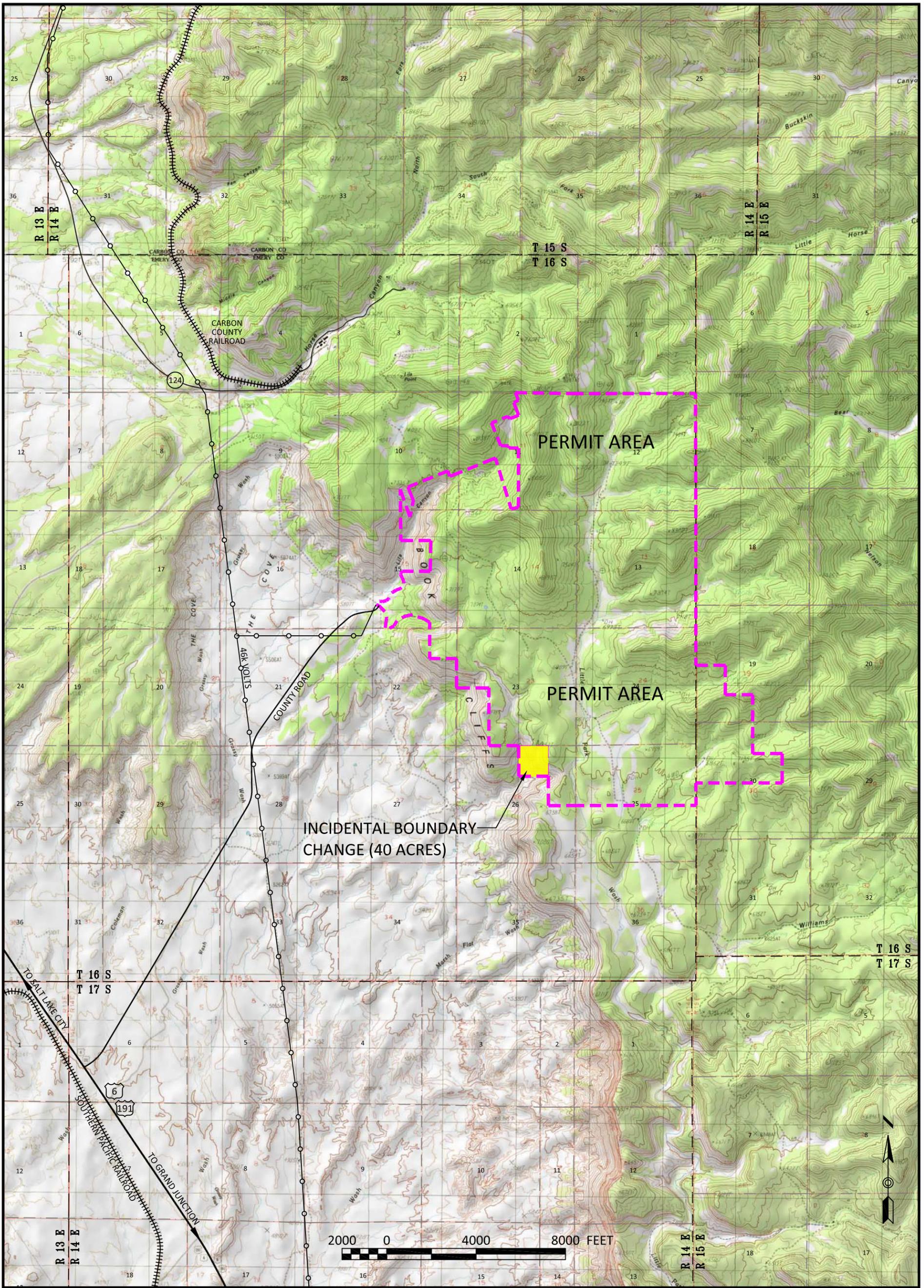
19. **FAIR MARKET VALUE BONUS:** Due to the uncertainty of the amount of recoverable coal reserves in this modification, the lessee will pay the fair market value (FMV) bonus payment for the coal resources mined in the area of Federal coal lease modification (UTSL-066490) Tract 2, at the rate of \$0.37 per ton for the actual tonnage mined, adjusted annually using the U. S. Bureau of Labor Statistics CPI West Urban Energy Index; or if that index is not available the BLM authorized officer will chose a comparable index to be used. Payment of FMV at the specified rate and tonnage mined will be on the schedule required for payment of production royalties to the Office of Natural Resources Revenue (ONRR). The lessee will clearly indicate which portion of the payment is for royalty and what is for the lease bonus payment.

Lila Canyon Mine

Appendix 5-9

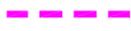
Attachment 2

Latest approved BLM R2P2 Map



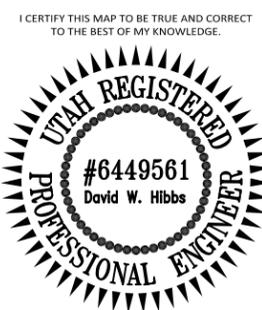
G:\Current Drawings\WRP Maps\Lila Canyon\IBC Sect. 26 Breakouts\Delcendes Task ID5197\Plate 1-1 Permit Area Map Task 5197.dwg, Plate 1-1, 8/3/2016 3:22:58 PM, 1:1

LEGEND: EXISTING PERMIT AREA: 4,663.6 ACRES (+ 40 ACRES IBC = 4,703.6 ACRES)

PERMIT AREA : 

INCIDENTAL BOUNDARY CHANGE AREA : 
(40 ACRES)

NOTE: Plate 1-1 is the official permit boundary map and it will be used to clarify any questions about the permit boundaries.



REVISIONS	
DATE	BY
12/13/2000	BJ
10/02/2002	RJM
02/08/2016	PJJ
08/03/2016	PJJ

PERMIT AREA MAP



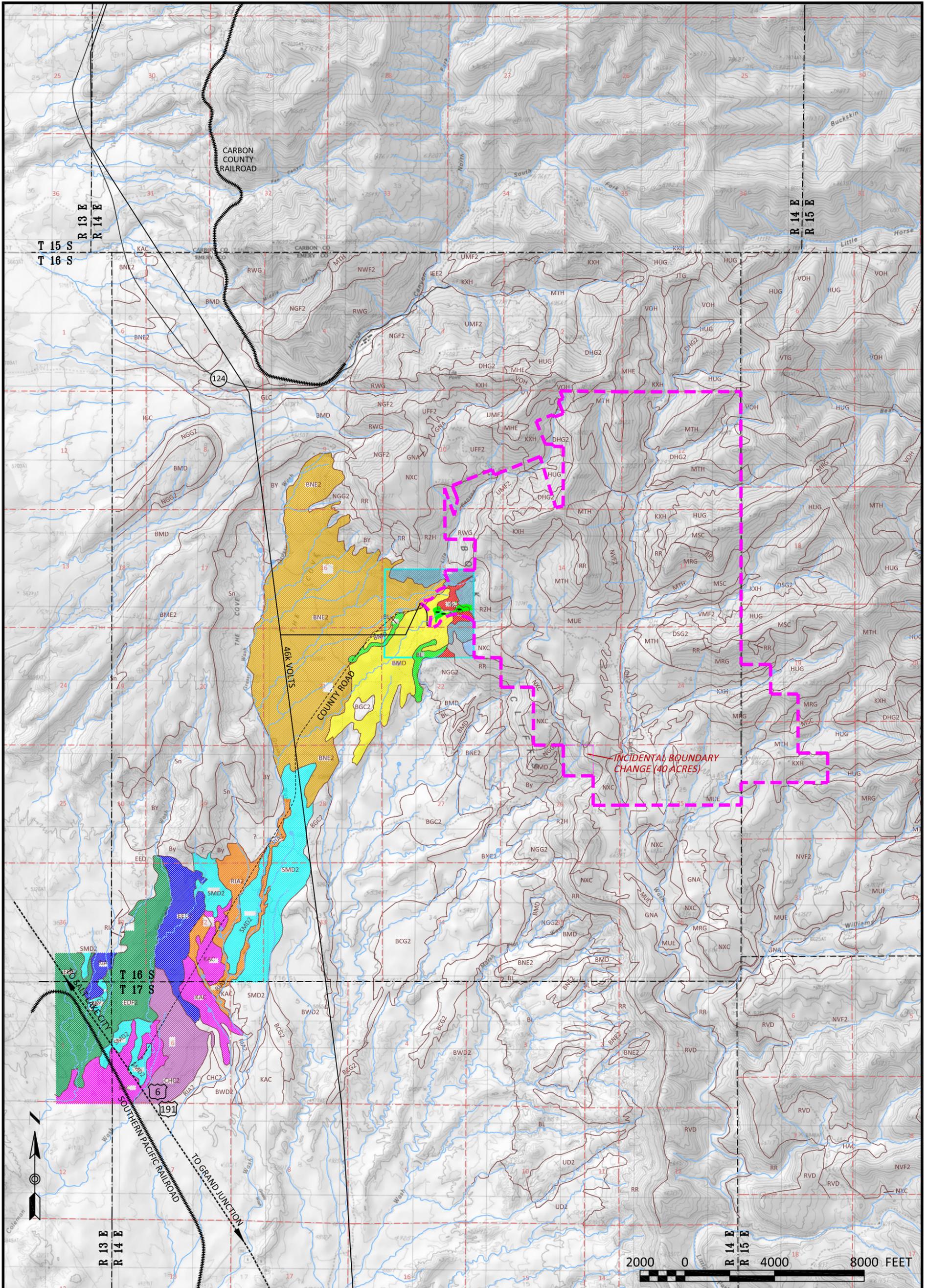
LILA CANYON MINE
23415 North Lila Canyon Road
Green River, Utah 84525

DOG M PERMIT# C0070013

DESIGN BY:  EIS

SCALE: 1" = 4,000'
ORIGINAL DATE: SEPT. 2000

PLATE 1-1



LEGEND: PERMIT AREA : Disturbed Area
 Area of Undisturbed within Disturbed Area

SOILS WITHIN THE DISTURBED SURFACE FACILITIES:

- RR Senchert loam, 3–15% slopes
- NGG2 Gerst–Strych–Badland Complex, 30–70% slopes
- NXC Travessilla sandy loam, 1–8% slopes
- R2H Travessilla family–Rock outcrop complex
- BMD Strych very stony fine sandy loam, 3–30% slopes
- BL Persao–Chipeta Badland, 3–20% slopes
- BNE2 Strych, very bouldery fine sandy loam, 3–20% slopes



REVISIONS

DATE	BY
JAN. 2008	RJM
DEC. 2010	RJM
02/08/2016	PJJ
06/01/2016	PJJ

SOILS MAP



LILA CANYON MINE

23415 North Lila Canyon Road
Green River, Utah 84525

DOGM PERMIT# C0070013

DESIGN BY:

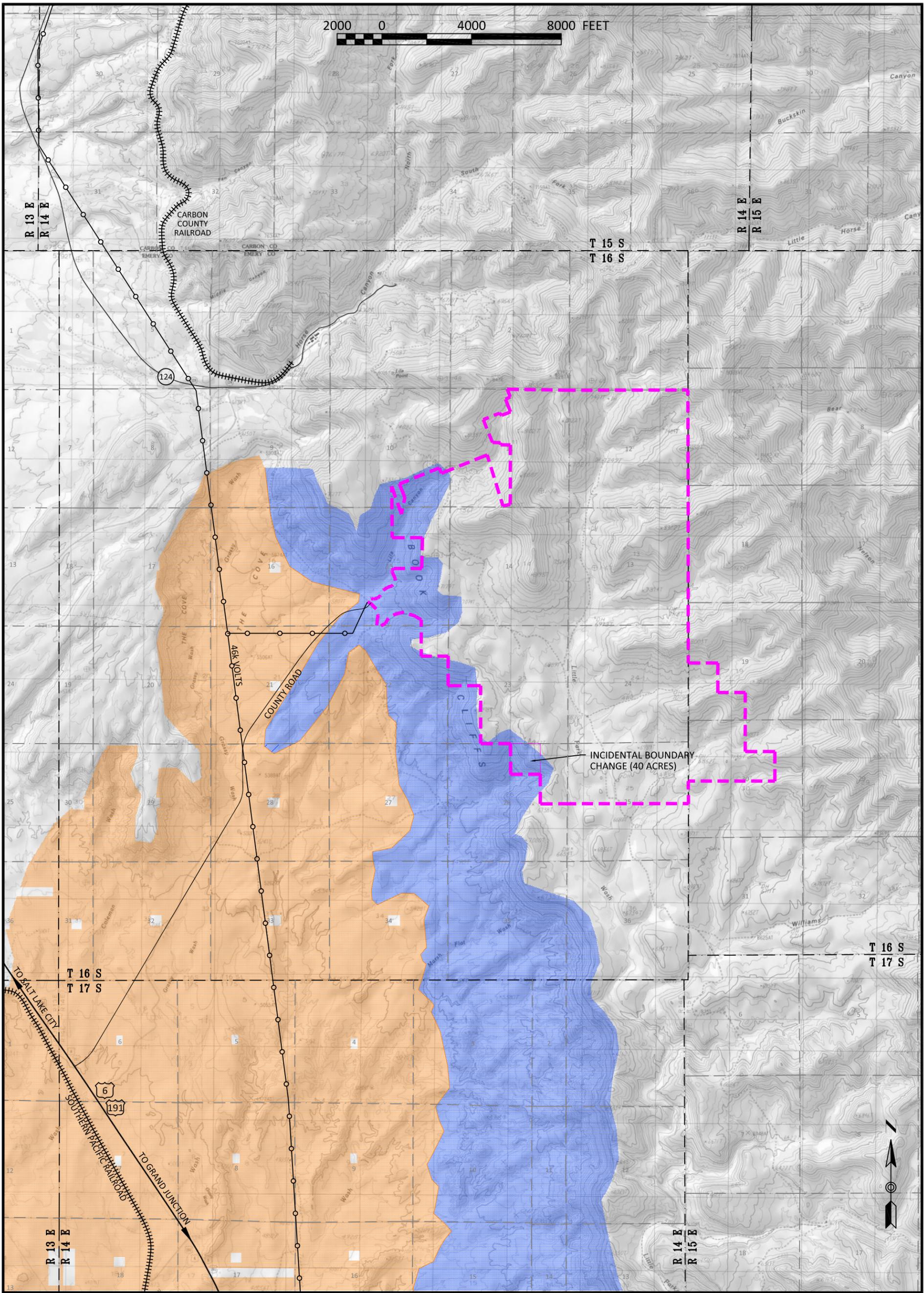


SCALE: 1" = 4,000'

ORIGINAL DATE: MAY 1998

PLATE 2-1

2000 0 4000 8000 FEET



T 15 S
T 16 S

R 14 E
R 15 E

R 13 E
R 14 E

T 16 S
T 17 S

R 14 E
R 15 E

T 16 S
T 17 S

LEGEND:

- Rocky Mountain Big Horn Sheep Habitat
- Pronghorn Antelope Yearlong Habitat
- Permit Line

2000 0 4000 8000 FEET



REVISIONS

DATE	BY
11 NOV. 1999	RJM
29 AUG. 2000	BJ
14 DEC. 2000	BJ
SEPT. 2002	RJM
APR. 2003	RJM
FEB. 8, 2016	PJJ
JUNE 1, 2016	PJJ

**WILDLIFE HABITAT:
BIG HORN SHEEP /
PRONGHORN ANTELOPE**

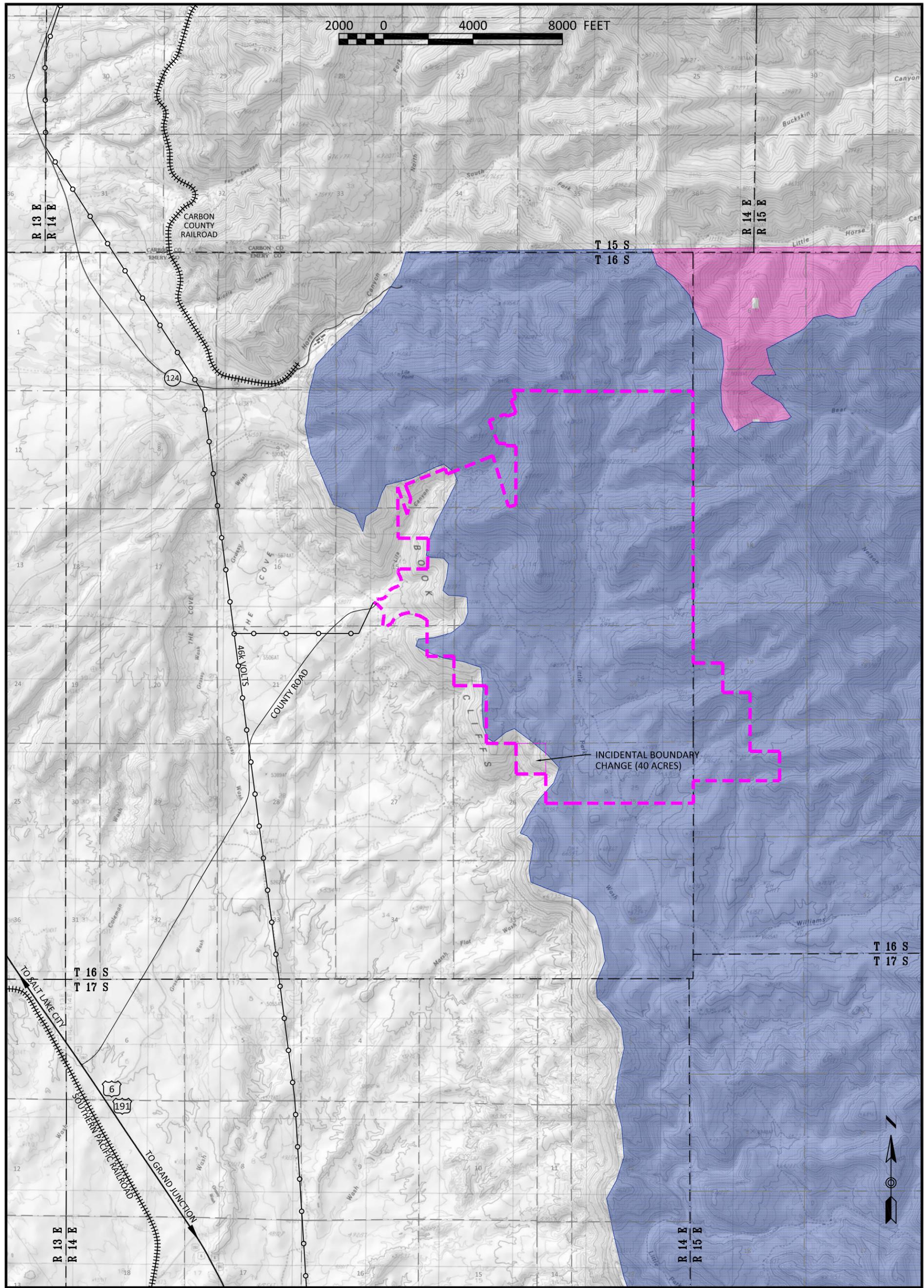
LILA CANYON MINE
23415 North Lila Canyon Road
Green River, Utah 84525

DOG M PERMIT# C0070013

DESIGN BY: EIS
SCALE: 1" = 4,000'
ORIGINAL DATE: SEPT. 2000

PLATE 3-1B

2000 0 4000 8000 FEET



INCIDENTAL BOUNDARY CHANGE (40 ACRES)

LEGEND:

-  Elk Winter Habitat
-  Elk Summer Habitat
-  Permit Line

2000 0 4000 8000 FEET



REVISIONS	
DATE	BY
11 NOV. 1999	RJM
29 AUG. 2000	BJ
14 DEC. 2000	BJ
SEPT. 2002	RJM
APR. 2003	RJM
FEB. 8, 2016	PJJ
JUNE 1, 2016	PJJ

WILDLIFE HABITAT:
ELK



LILA CANYON MINE
23415 North Lila Canyon Road
Green River, Utah 84525

DOGDM PERMIT# C0070013

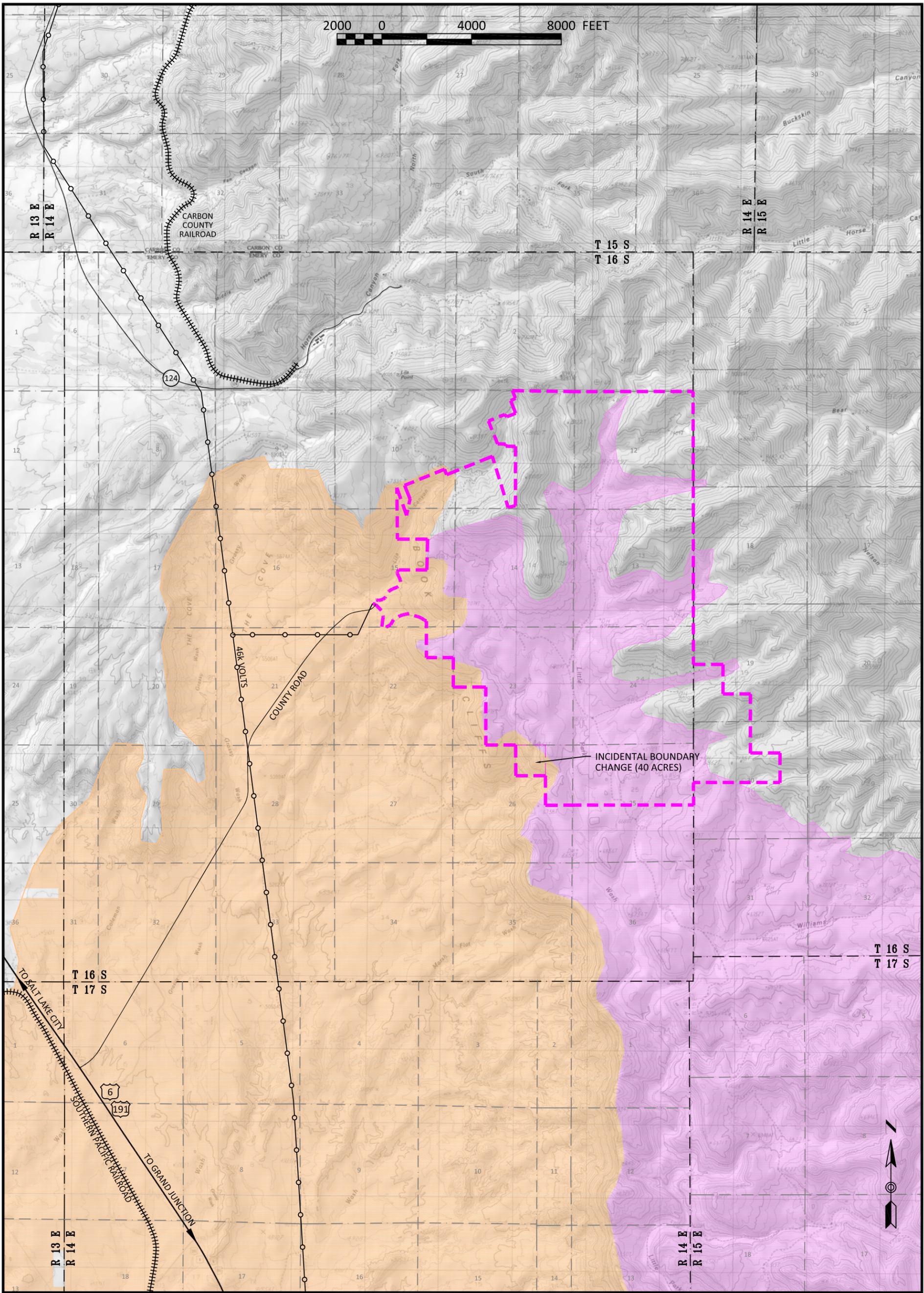
DESIGN BY:  EIS

SCALE: 1" = 4,000'
ORIGINAL DATE: SEPT. 2000

PLATE 3-1C

K:\Lila\2016\16-001 Ventilation Breakout and Removal of Part A and B References\Deliverables Task 5081\Drawings\Plate 3-1 Wildlife Habitat Confidential Task 5081.dwg, 3-1C ELK, 6/1/2016 12:16:52 PM, 1:1

2000 0 4000 8000 FEET



INCIDENTAL BOUNDARY CHANGE (40 ACRES)

K:\Lila\2016\16-001 Ventilation Breakout and Removal of Part A and B References\Drawings\Plate 3-1 Wildlife Habitat Confidential Task 5081.dwg, 3-1D DEER, 6/1/2016 12:19:12 PM, 1:1

LEGEND:

- Mule Deer Critical Habitat
- Mule Deer Yearlong Habitat
- Permit Line

2000 0 4000 8000 FEET



REVISIONS	
DATE	BY
11 NOV. 1999	RJM
29 AUG. 2000	BJ
14 DEC. 2000	BJ
SEPT. 2002	RJM
APR. 2003	RJM
FEB. 8, 2016	PJJ
JUNE 1, 2016	PJJ

WILDLIFE HABITAT
MULE DEER

LILA CANYON MINE
23415 North Lila Canyon Road
Green River, Utah 84525

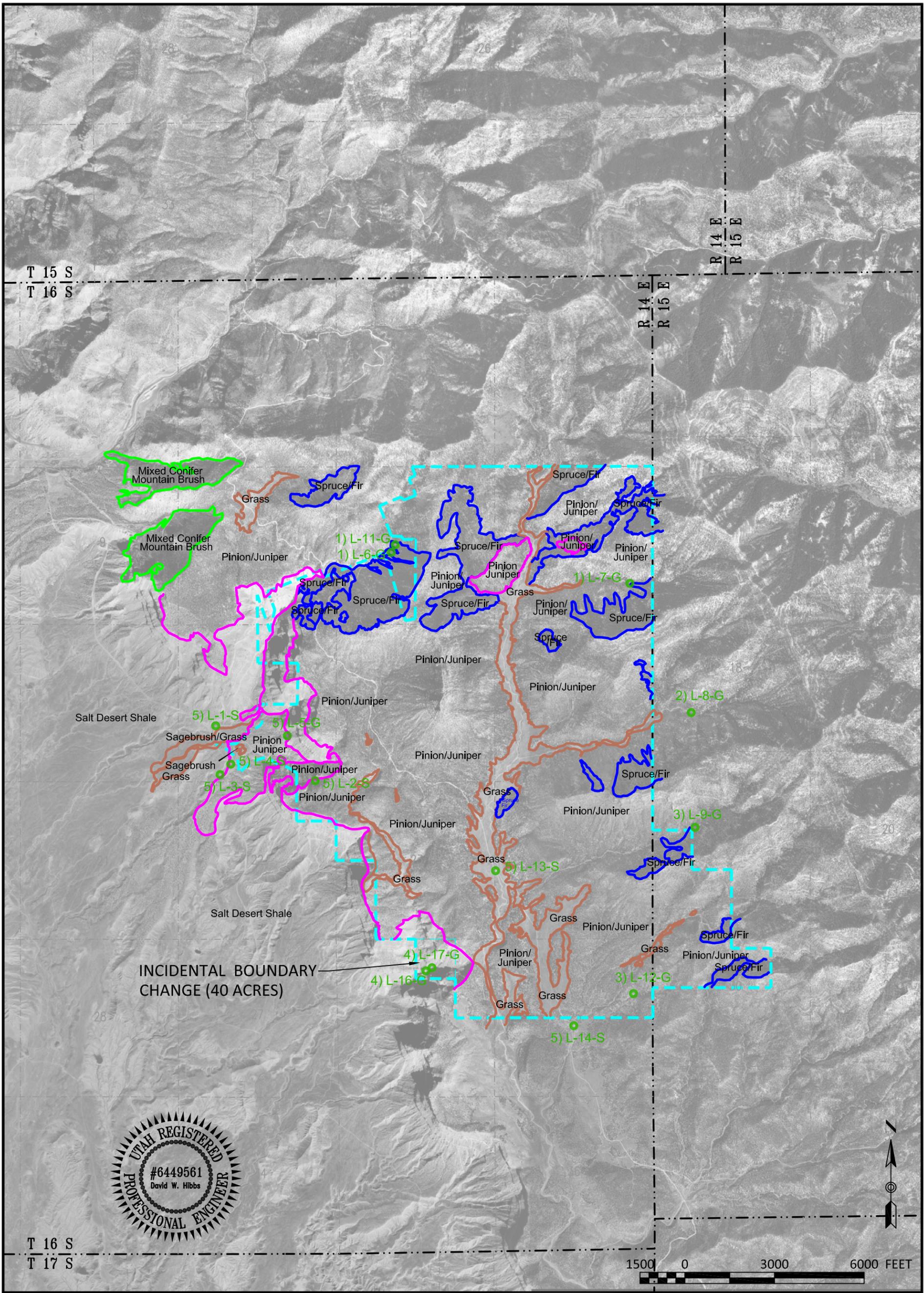
DOG M PERMIT# C0070013

DESIGN BY: EIS

SCALE: 1" = 4,000'
ORIGINAL DATE: SEPT. 2000

PLATE 3-1D

K:\Lila\2016\16-001 Ventilation Breakout and Removal of Part A and B References\Drawings\Plate 3-2 Vegetation Map Task 5081.dwg, Plate 3-2, 6/17/2016 12:22:46 PM, 1:1



LEGEND:

- Salt Desert Shale / Grass ———
- Pinion/Juniper ———
- Spruce/Fir ———
- Mountain Brush ———
- Permit Boundary - - - - -
- Spring Vegetation Key and Water Monitoring Location ● 2) L-15-G

Spring Vegetation Key
(See Appendix 7-8 for Additional Details)

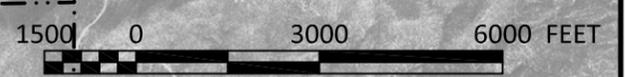
- 1) Habitat overstory is Douglas Fir-Mountain Brush association.
- 2) Habitat is predominantly Pinyon-Juniper and sagebrush grass associations.
- 3) Wet meadow habitat with an overstory of Pinyon-Juniper and sagebrush grass associations.
- 4) Habitat is a mix of grasses and salt desert shrub habitat and invasive tamarisk.
- 5) Habitat is a sagebrush with Pinyon-Juniper overstory.

REVISIONS

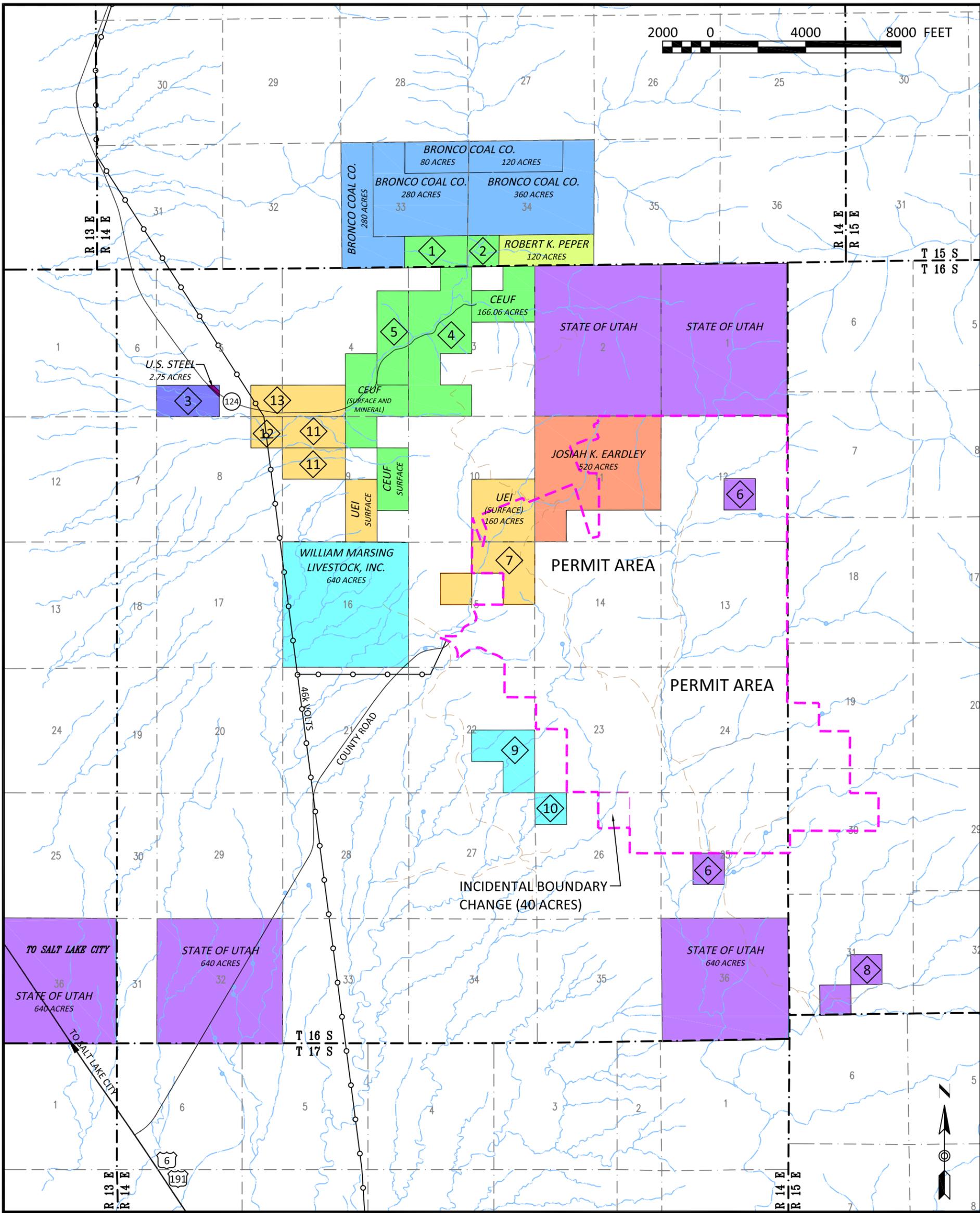
DATE	BY
02/08/2016	PJJ
06/01/2016	PJJ

VEGETATION MAP

LILA CANYON MINE
 23415 North Lila Canyon Road
 Green River, Utah 84525
 DOGM PERMIT# C0070013
 DESIGN BY: **EIS** SCALE: 1" = 4,000'
 ORIGINAL DATE: OCT. 2002
PLATE 3-2



2000 0 4000 8000 FEET



KEYED PROPERTY NOTES

- | | | | |
|--|--|---|---|
| 1 CEUF (SURFACE AND MINERAL)
80 ACRES | 5 CEUF (SURFACE AND MINERAL)
114.82 ACRES | 9 WILLIAM MARSING LIVESTOCK, INC.
120 ACRES | 13 UEI (SURFACE AND MINERAL)
35.41 ACRES |
| 2 CEUF (SURFACE AND MINERAL)
40 ACRES | 6 STATE OF UTAH
40 ACRES | 10 WILLIAM MARSING LIVESTOCK, INC.
400 ACRES | |
| 3 EMERY COUNTY
77.25 ACRES | 7 UEI (SURFACE)
160 ACRES | 11 UEI (SURFACE AND MINERAL)
80 ACRES | |
| 4 CEUF (SURFACE AND MINERAL)
231.85 ACRES | 8 STATE OF UTAH
80 ACRES | 12 UEI (SURFACE AND MINERAL)
40 ACRES | |

LEGEND:

ALL LANDS OWNED BY BUREAU OF LAND MANAGEMENT UNLESS NOTED OTHERWISE.

- | | |
|-----------------------------------|----------------------------|
| PERMIT AREA : | UtahAmerican Energy, Inc. |
| Emery County | W. Marsing Livestock, Inc. |
| Brent M. Davies (Bronco Coal Co.) | Robert K. Peper |
| Josiah K. Eardley | U.S. Steel |
| CEUF | State of Utah |



REVISIONS	
DATE	BY
AUG. 2000	BJ
DEC. 2000	BJ
SEPT. 2002	RJM
AUG. 2003	RJM
DEC. 2005	RJM
FEB. 8, 2016	PJJ
JUNE 1, 2016	PJJ

SURFACE OWNERSHIP

LILA CANYON MINE

23415 North Lila Canyon Road
Green River, Utah 84525

DOGDM PERMIT# C0070013

DESIGN BY: EIS

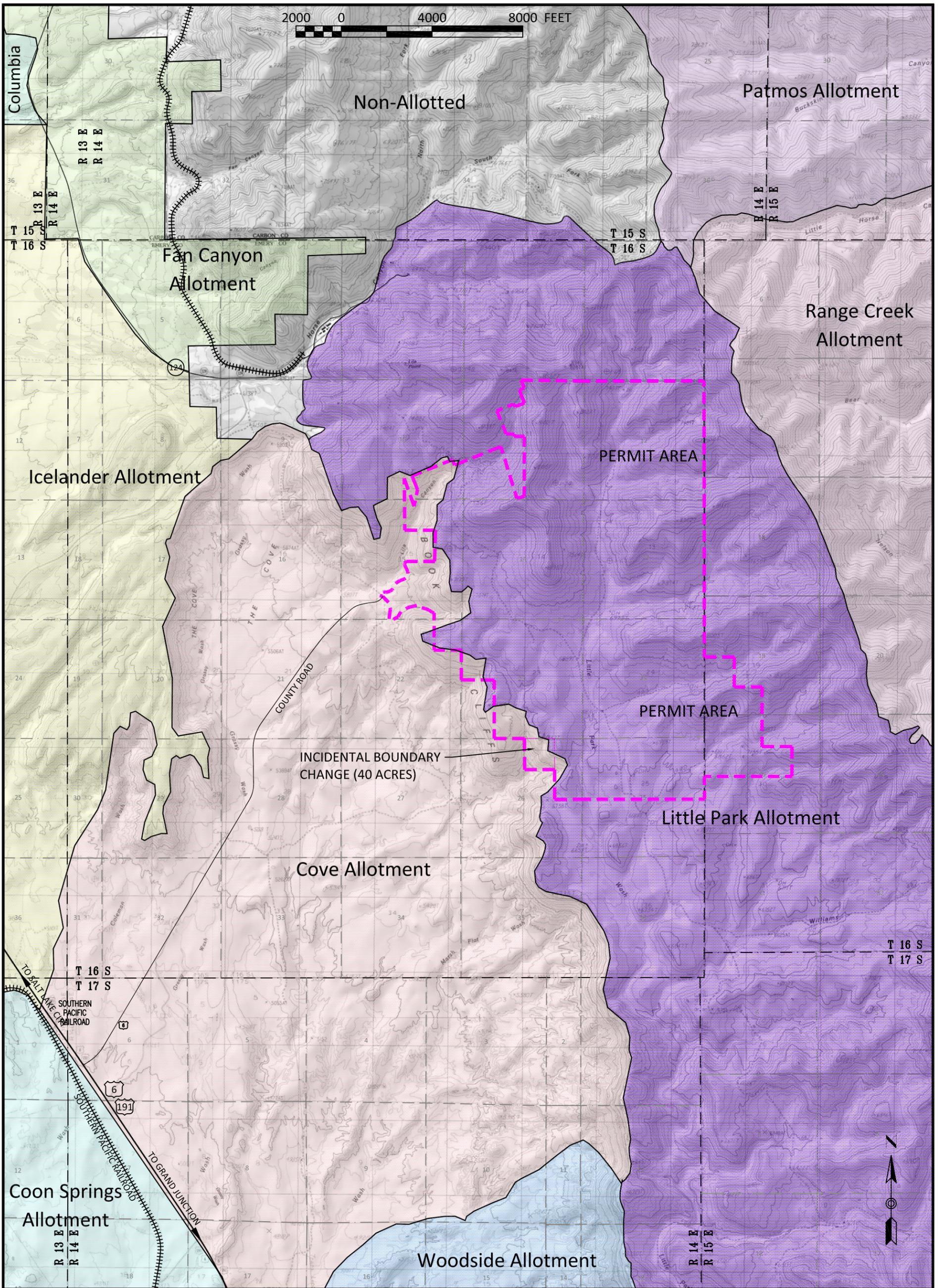
SCALE: 1" = 4,000'

ORIGINAL DATE: JULY 1999

PLATE 4-1

K:\Lila\2016\16-001 Ventilation Breakout and Removal of Part A and B References\Deliverables\Task 5081\Drawings\Plate 4-1 Surface Ownership\Task 5081.dwg, Plate #=1, 6/11/2016 1:24:40 PM, 1:1

2000 0 4000 8000 FEET



LEGEND:

GRAZING ALLOTMENTS:

- Columbia Allotment
- Coon Springs Allotment
- Cove Allotment
- Fan Canyon Allotment
- Icelander Allotment
- Little Park Allotment
- Non-Allotted
- Patmos Allotment
- Range Creek Allotment
- Woodside Allotment

PERMIT AREA : - - - - -



REVISIONS

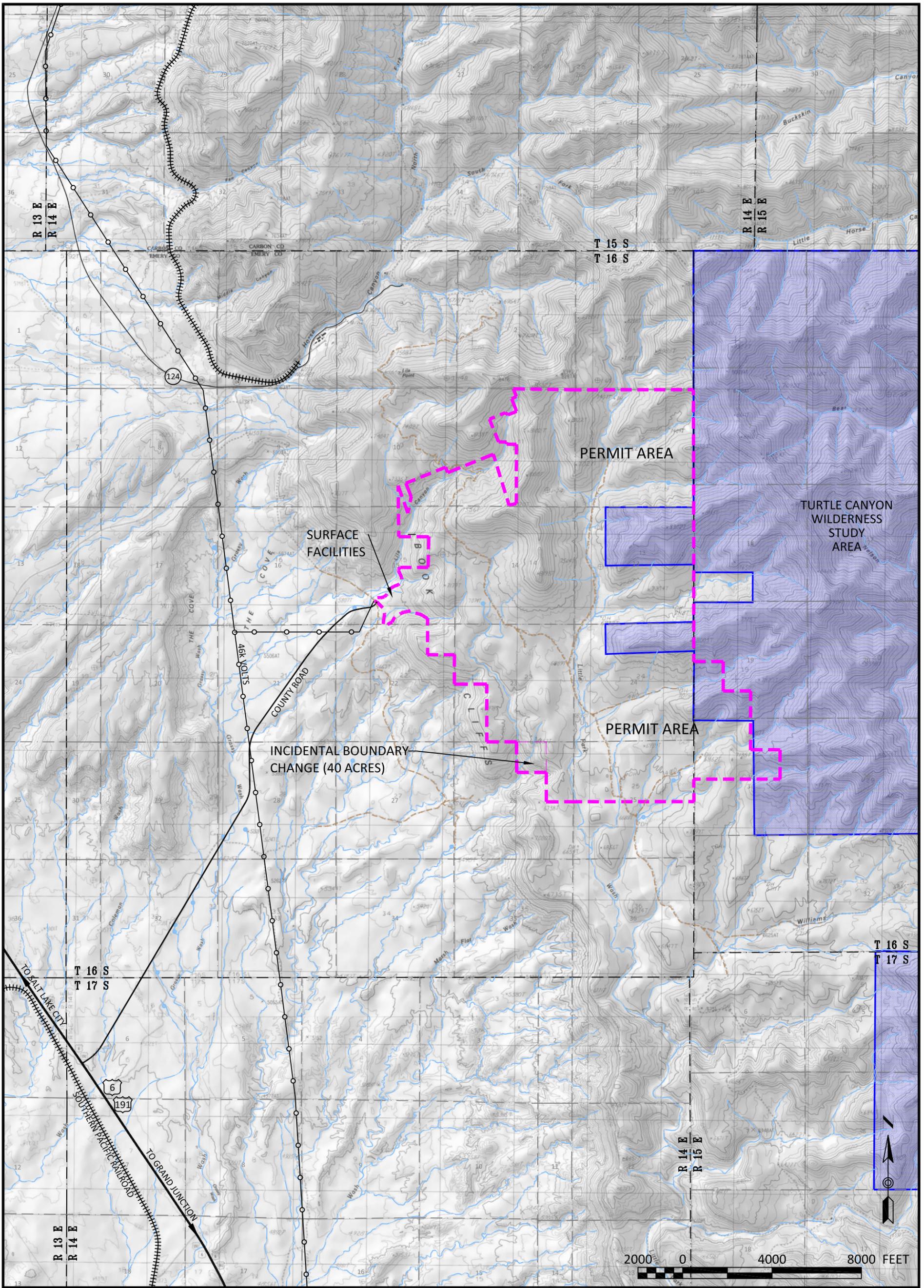
DATE	BY
AUG. 29, 2000	BJ
DEC. 14, 2000	BJ
SEPT. 19, 2002	RJM
FEB. 8, 2016	PJJ
JUNE 1, 2016	PJJ

GRAZING ALLOTMENTS

LILA CANYON MINE
 23415 North Lila Canyon Road
 Green River, Utah 84525
 DOGM PERMIT# C0070013
 DESIGN BY: **EIS** SCALE: 1" = 4,000'
 ORIGINAL DATE: APRIL 1998
PLATE 4-2

K:\Lila\2016\16-001 Ventilation Breakout and Removal of Part A and B References\Deliverables Task 5081\Drawings\Plate 4-2 Grazing Allotments Task 5081.dwg, Plate 4-2, 6/1/2016 1:27:38 PM, 1:1

K:\Lila\2016\16-001 Ventilation Breakout and Removal of Part A and B References\Drawings\Plate 4-4 Wilderness Character Task 5081.dwg, Plate 4-4, 6/1/2016 1:34:51 PM, 1:1



LEGEND:

- TURTLE CANYON WSA :
- PERMIT AREA :
- EPHEMERAL STREAM :



REVISIONS	
DATE	BY
12/2000	BJ
09/2002	RJM
02/08/2016	PJJ
06/01/2016	PJJ

AREA OF WILDERNESS CHARACTER

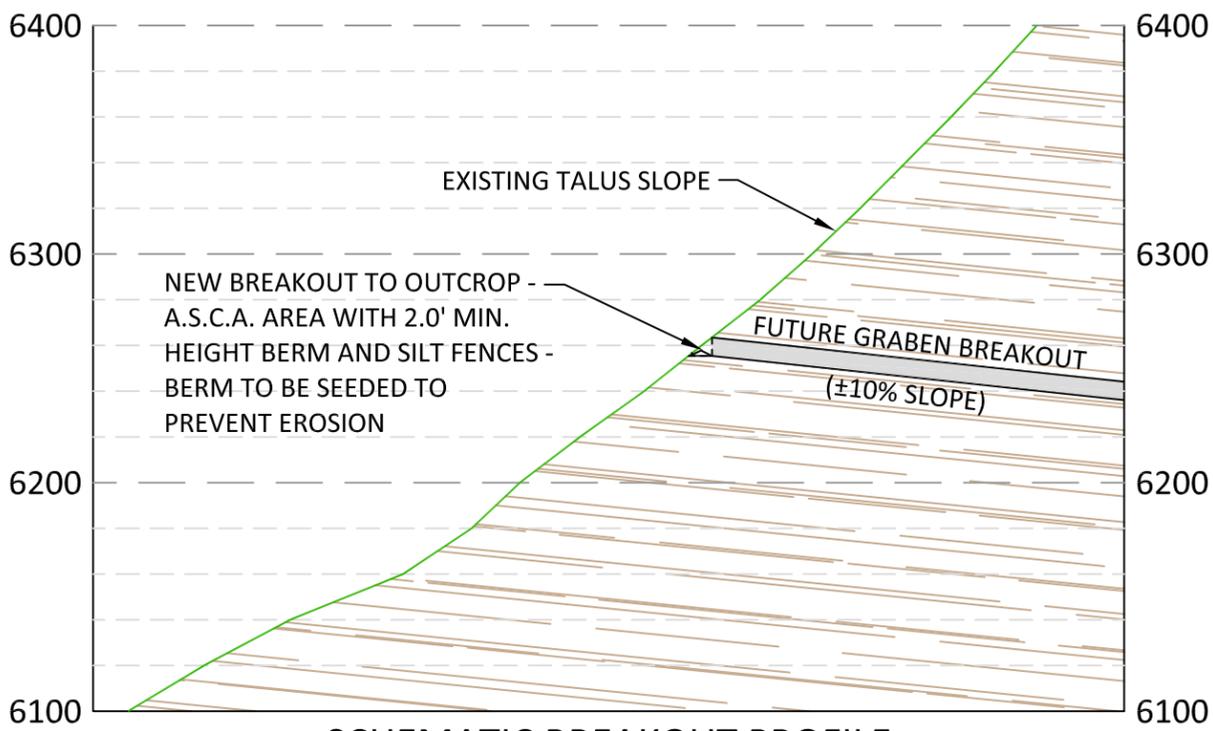
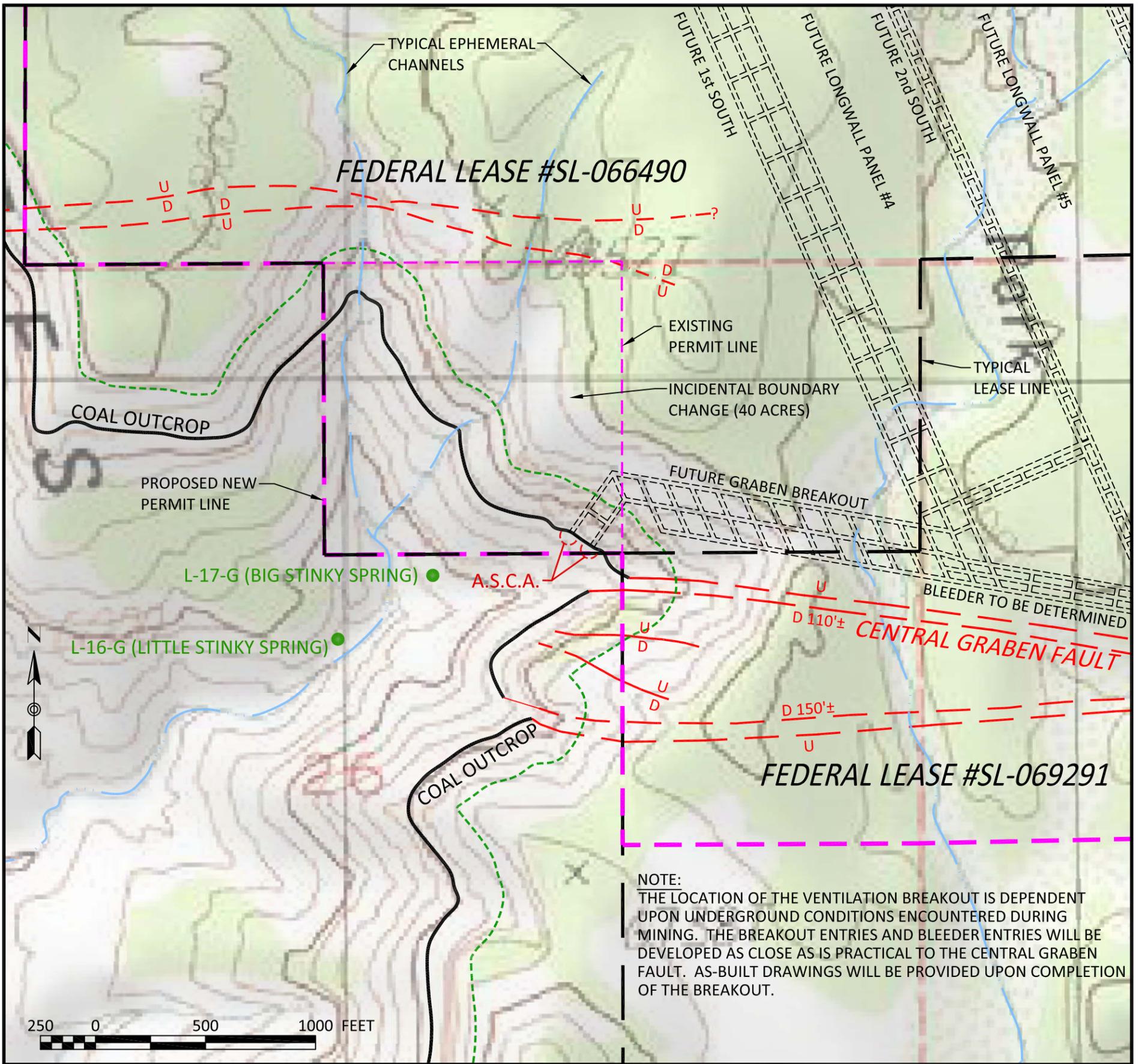
LILA CANYON MINE

23415 North Lila Canyon Road
Green River, Utah 84525

DOG M PERMIT# C0070013

DESIGN BY:	SCALE:
EIS	1" = 4,000'
	ORIGINAL DATE:
	SEPT. 2000

PLATE 4-4



SCHEMATIC BREAKOUT PROFILE

LEGEND:

- PERMIT AREA :
- EPHEMERAL CHANNEL :
- COAL OUTCROP :
- FAULTS :
- 200' OUTCROP BARRIER :
- SPRING LOCATION :
- TYPICAL FUTURE MINING : (UNDERGROUND)



REVISIONS

DATE	BY
8/03/2016	PJJ

IBC AREA - GRABEN BREAKOUT

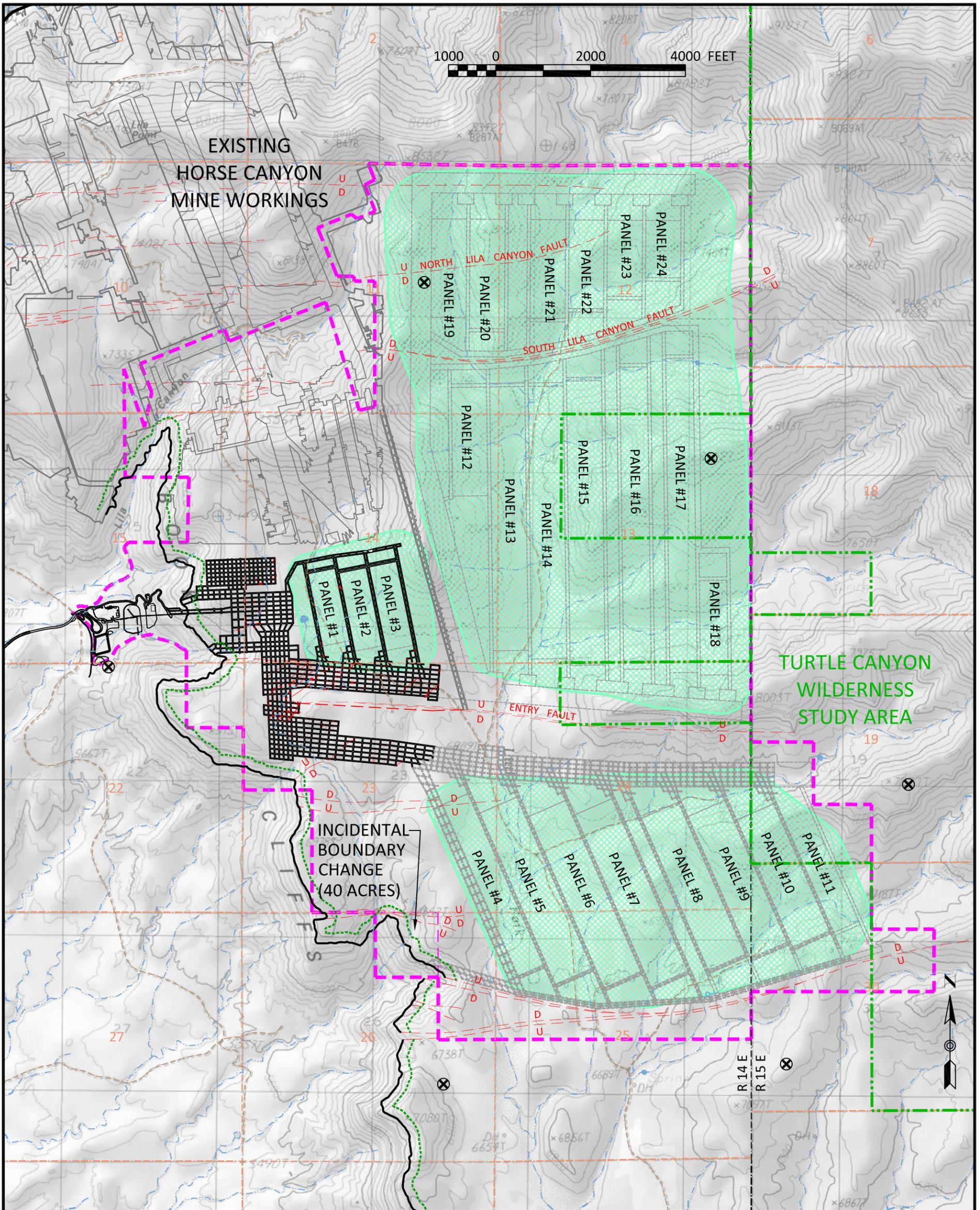


23415 North Lila Canyon Road
Green River, Utah 84525

DOG M PERMIT# C0070013

DESIGN BY: UEI
SCALE: AS SHOWN
ORIGINAL DATE: 8 FEB. 2016

PLATE 5-2a



NOTES:

1. Mine projections are subject to change depending on conditions encountered in the underground mine workings.
2. Actual mine works are shown as of January 31, 2016.
3. Any mine projections depicted in the fringe areas beyond the existing permit area are speculative and based on future reserve acquisitions.
4. No mining will be conducted in these areas unless those reserves are acquired in the future and permitted according to federal, state, and local permitting requirements.
5. UtahAmerican Energy, Inc. acknowledges that permission to mine within the permit boundary does not imply permission to mine beyond the permit boundary.
6. Longwall panels will be reconfigured as needed to prevent unauthorized subsidence beyond the permit area if extended reserves are not acquired in the future.
7. Additional control points may be added as mining advances.

LEGEND:

- PERMIT AREA :
- EPHEMERAL CHANNEL :
- PAVED ROAD :
- UNPAVED ROAD :
- COAL OUTCROP :
- FAULTS :
- WILDERNESS STUDY AREA :
- OUTCROP BARRIER :
- MAXIMUM EXTENT OF SUBSIDENCE: (USING 21.5° DRAW ANGLE)

PROPOSED SUBSIDENCE POINT :



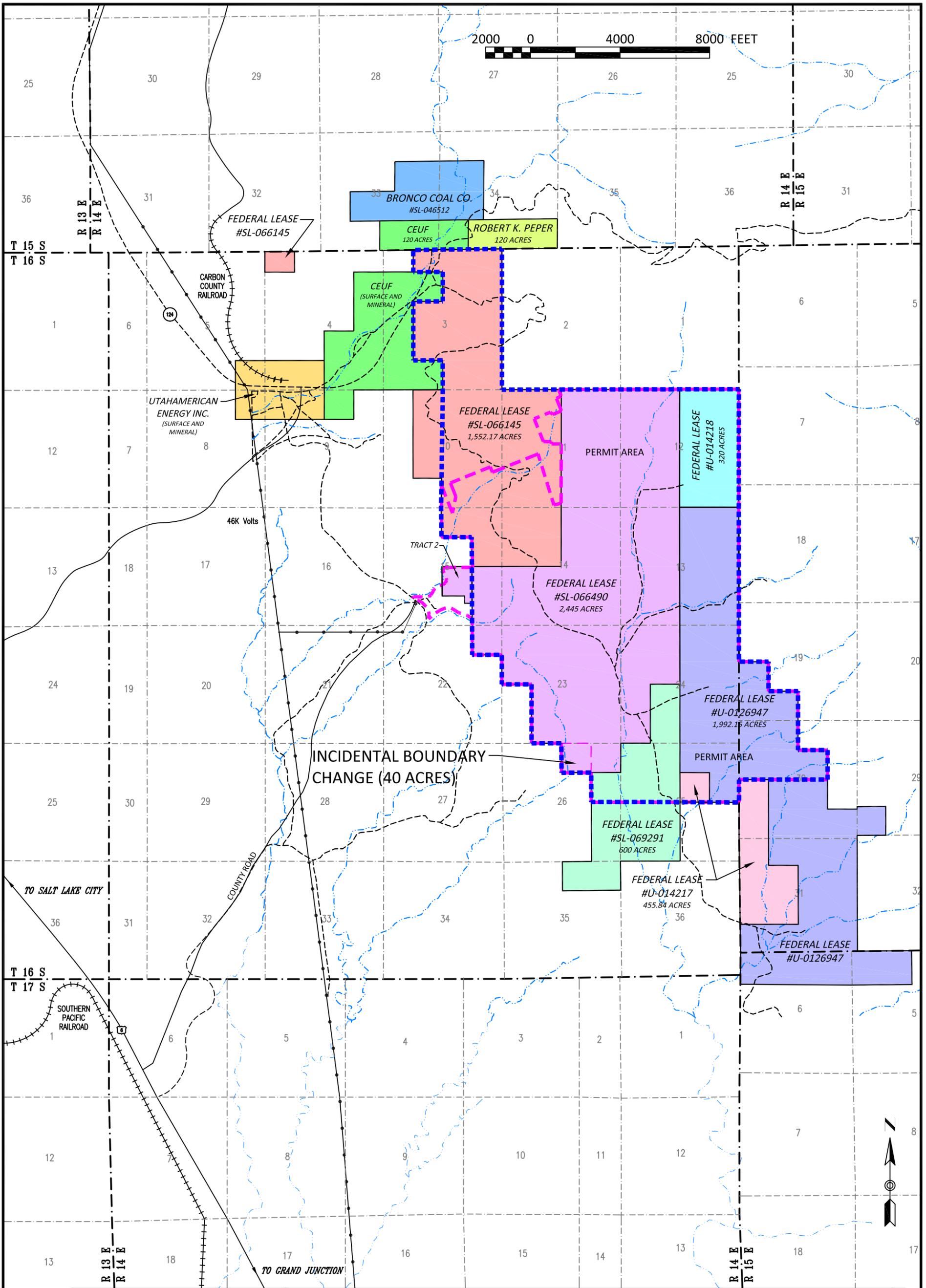
REVISIONS

DATE	BY	DATE	BY
NOV. 20, 1999	BJ	FEBRUARY 2007	RJM
AUG. 29, 2000	BJ	FEB. 8, 2016	PJJ
JAN. 09, 2001	BJ	JUNE 1, 2016	PJJ
MAR. 21, 2001	BJ		
SEPT. 20, 2002	RJM		
AUG. 19, 2003	RJM		
DEC. 20, 2004	RJM		
JANUARY 2005	RJM		

SUBSIDENCE CONTROL MAP

LILA CANYON MINE
 23415 North Lila Canyon Road
 Green River, Utah 84525
 DOGM PERMIT# C0070013
 DESIGN BY: UEI
 SCALE: 1" = 2,000'
 ORIGINAL DATE: NOV. 1999

PLATE 5-3



LEGEND:

PERMIT AREA :		LMU #UTU-73516:	
LEASE SL-066490		LEASE SL-066145	
LEASE U-014218		LEASE U-014217	
LEASE U-0126947		LEASE SL-069291	
LEASE SL-046512		ROBERT K PEPPER	
CEUF		UtahAmerican Energy	

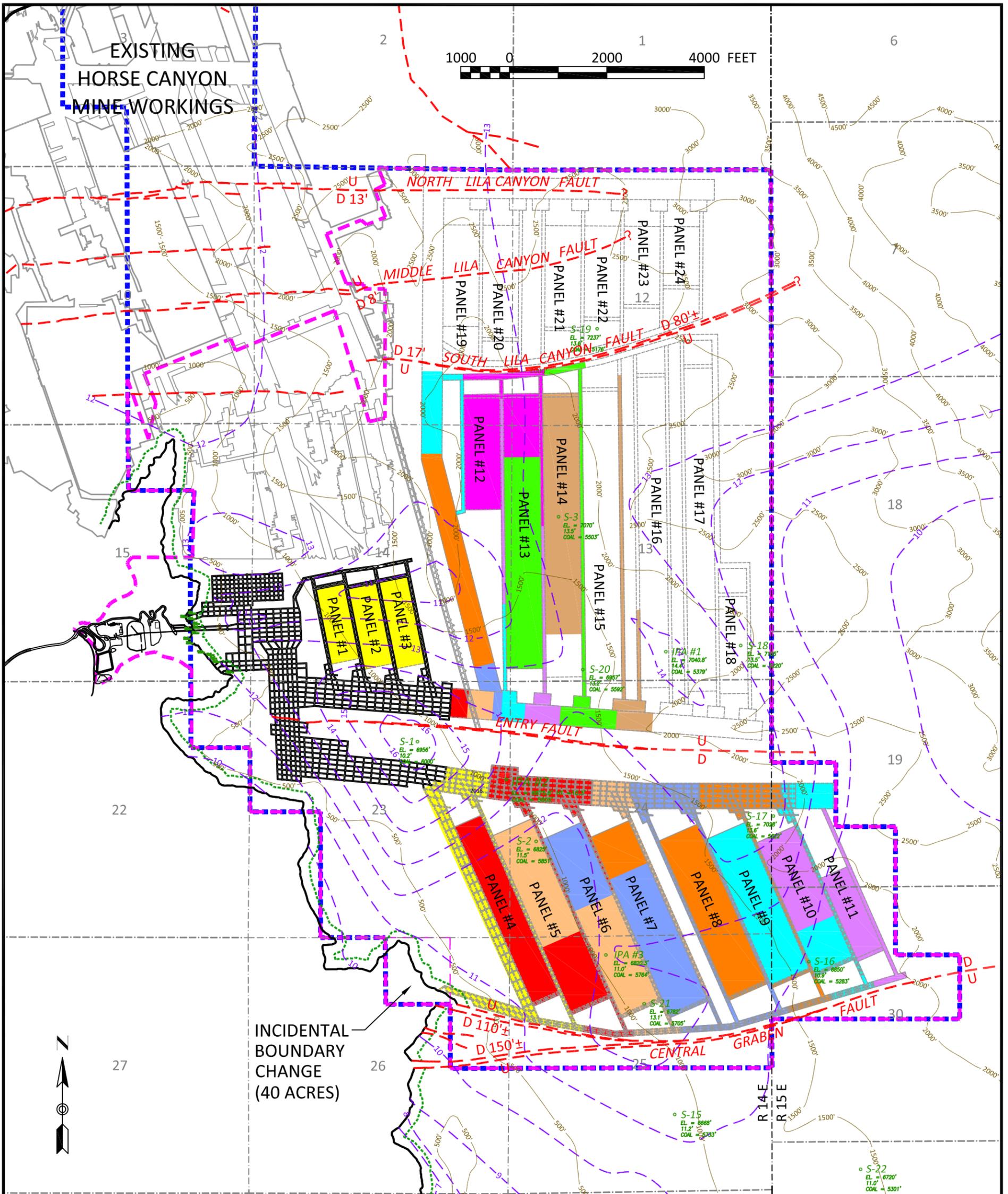


REVISIONS

DATE	BY
8/29/2000	BJ
12/13/2000	BJ
09/20/2002	RJM
09/08/2003	RJM
12/01/2005	RJM
02/08/2016	PJJ
08/03/2016	PJJ

COAL OWNERSHIP

LILA CANYON MINE	
23415 North Lila Canyon Road Green River, Utah 84525	
DOGM PERMIT# C0070013	
DESIGN BY:	SCALE: 1" = 4,000'
	ORIGINAL DATE: MARCH 1998
PLATE 5-4	



NOTES:

1. Mine projections are subject to change depending on conditions encountered in the underground mine workings.
2. Actual mine works are shown as of January 31, 2016.
3. Any mine projections depicted in the fringe areas beyond the existing permit area are speculative and based on future reserve acquisitions.
4. No mining will be conducted in these areas unless those reserves are acquired in the future and permitted according to federal, state, and local permitting requirements.
5. UtahAmerican Energy, Inc. acknowledges that permission to mine within the permit boundary does not imply permission to mine beyond the permit boundary.
6. Longwall panels will be reconfigured as needed to prevent unauthorized subsidence beyond the permit area if extended reserves are not acquired in the future.
7. Additional control points may be added as mining advances.



LEGEND:

- PERMIT AREA :
- COAL OUTCROP :
- FAULTS :
- OUTCROP BARRIER :
- SEAM THICKNESS ISOPACHS : (IN FEET)
- COVER (500' INTERVALS) :
- LMU #UTU-73516 :
- EXISTING MINE WORKINGS:

PROJECTED MINING:

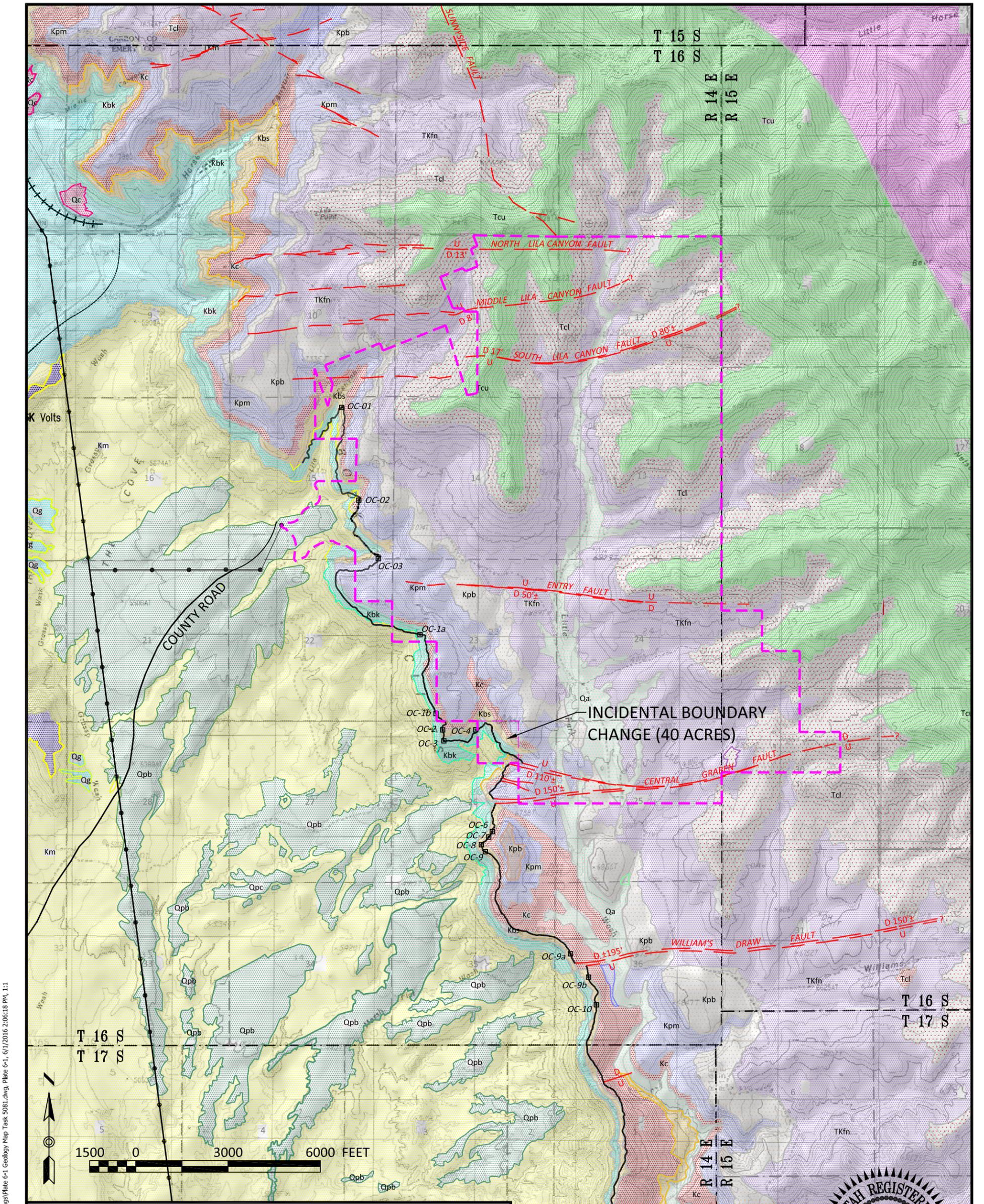
- 2016
- 2017
- 2018
- 2019
- 2020
- 2021
- 2022
- 2023
- 2024
- 2025

REVISIONS

DATE	BY	DATE	BY
APR. 23, 1998	RJM	JUNE 1, 2016	PJJ
AUG. 28, 2000	BJ		
DEC. 14, 2000	BJ		
SEPT. 20, 2002	RJM		
OCT. 15, 2003	RJM		
DEC. 29, 2004	RJM		
JAN. 14, 2005	RJM		
FEB. 8, 2016	PJJ		

MINE MAP

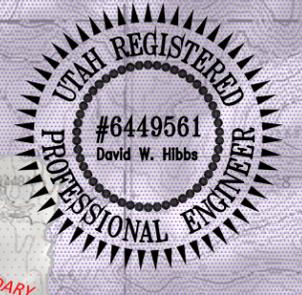
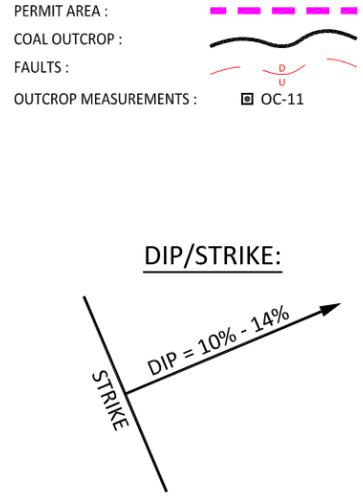
LILA CANYON MINE
23415 North Lila Canyon Road
Green River, Utah 84525
DOGM PERMIT# C0070013
DESIGN BY: UEI
SCALE: 1" = 2,000'
ORIGINAL DATE: JAN.. 1999



INCIDENTAL BOUNDARY CHANGE (40 ACRES)

LEGEND:

- YOUNGER SURFICIAL DEPOSITS: Stream alluvium (Qa)
- YOUNGER SURFICIAL DEPOSITS: Gravel thin deposits (Qg)
- OLDER SURFICIAL DEPOSITS: Colluvium & slopewash deposits (Qc)
- OLDER SURFICIAL DEPOSITS: Alluvium fan deposits (Qf)
- PEDIMENT DEPOSITS: Unit A (Qpa)
- PEDIMENT DEPOSITS: Unit B (Qpb)
- PEDIMENT DEPOSITS: Unit C (Qpc)
- COLTON FORMATION: Undivided (Tc)
- COLTON FORMATION: Upper member (Tcu)
- COLTON FORMATION: Lower member (Tcl)
- FLAGSTAFF LIMESTONE AND NORTH HORN FORMATION: (TKfn)
- PRICE RIVER FORMATION: Bluecastle sandstone member (Kpb)
- PRICE RIVER FORMATION: Mudstone member (Kpm)
- CASTLEGATE SANDSTONE OF MESAVERDE GROUP: (Kc)
- Upper mudstone member of Sunnyside member (Kbs)
- BLACKHAWK FORMATION OF MESAVERDE GROUP: Upper mudstone member of Kenilworth member (Kbk)
- MANCOS SHALE: Main body (Km)



REVISIONS			
DATE	BY	DATE	BY
06/01/2016	PJJ	11/20/99	BJ
		08/29/2000	BJ
		12/14/2000	BJ
		09/20/2002	RJM
		11/20/2006	TJS
		01/12/2007	RJM
		02/01/2007	RJM
		02/08/2016	PJJ

PROJECT AREA GEOLOGIC MAP

LILA CANYON MINE

23415 North Lila Canyon Road
Green River, Utah 84525

DOG M PERMIT# C0070013

DESIGN BY: EIS

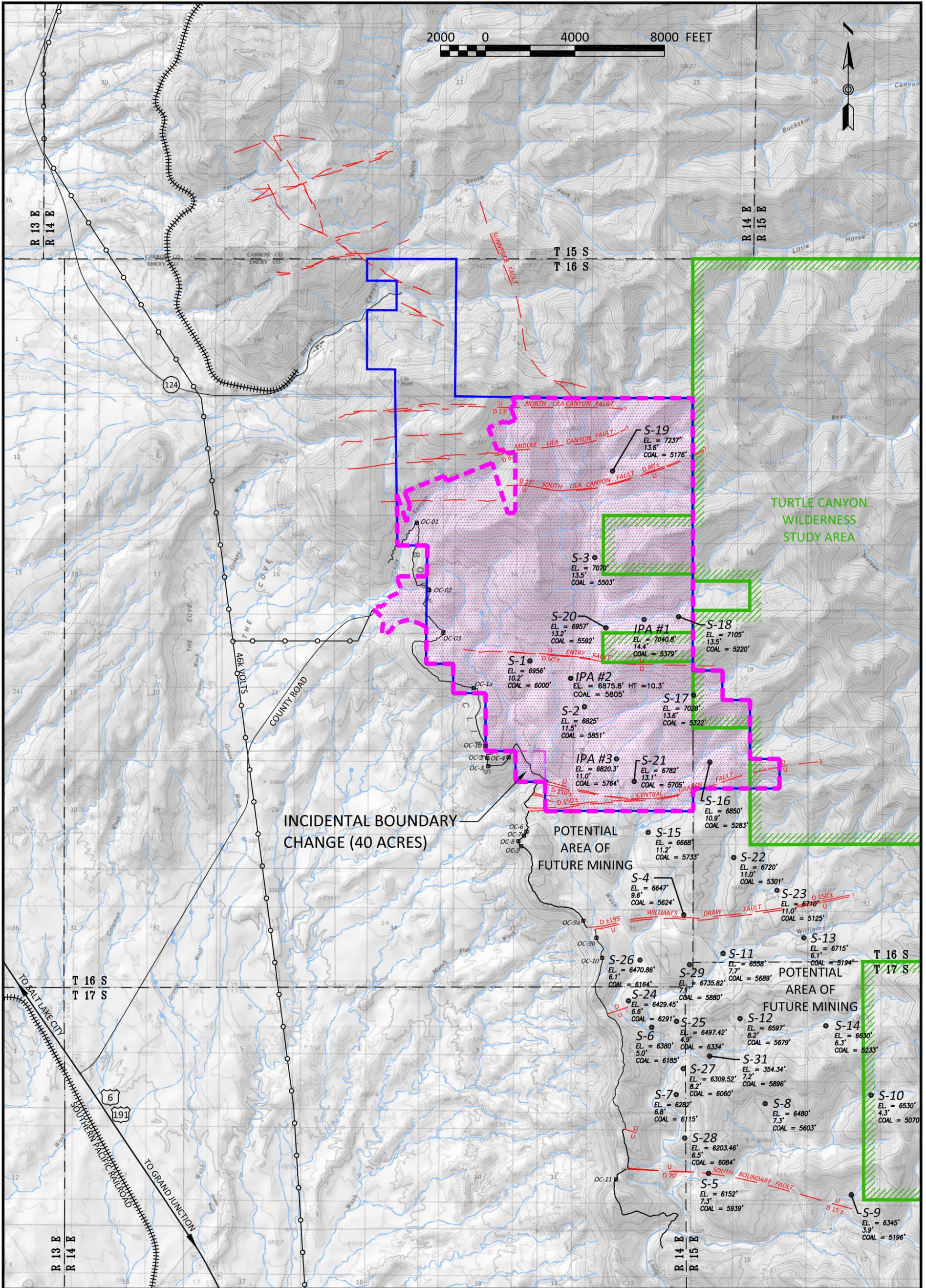
SCALE: 1" = 3,000'

ORIGINAL DATE: MARCH 1998

PLATE 6-1

K:\Lila\2016\16-001 Ventilation Breakout and Removal of Part A and B References\Deliverables Task 5081\Drawings\Plate 6-1 Geology Map Task 5081.dwg, Plate 6-1, 6/17/2016 2:06:18 PM, 1:1

2000 0 4000 8000 FEET



INCIDENTAL BOUNDARY CHANGE (40 ACRES)

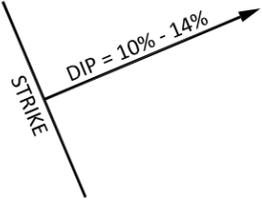
POTENTIAL AREA OF FUTURE MINING

TURTLE CANYON WILDERNESS STUDY AREA

LEGEND:

- PERMIT AREA :
- COAL OUTCROP :
- FAULTS :
- OUTCROP MEASUREMENTS :
- LMU AREA :
- WILDERNESS STUDY AREA :
- DRILL HOLES :
- EPHEMERAL STREAMS :

DIP/STRIKE:



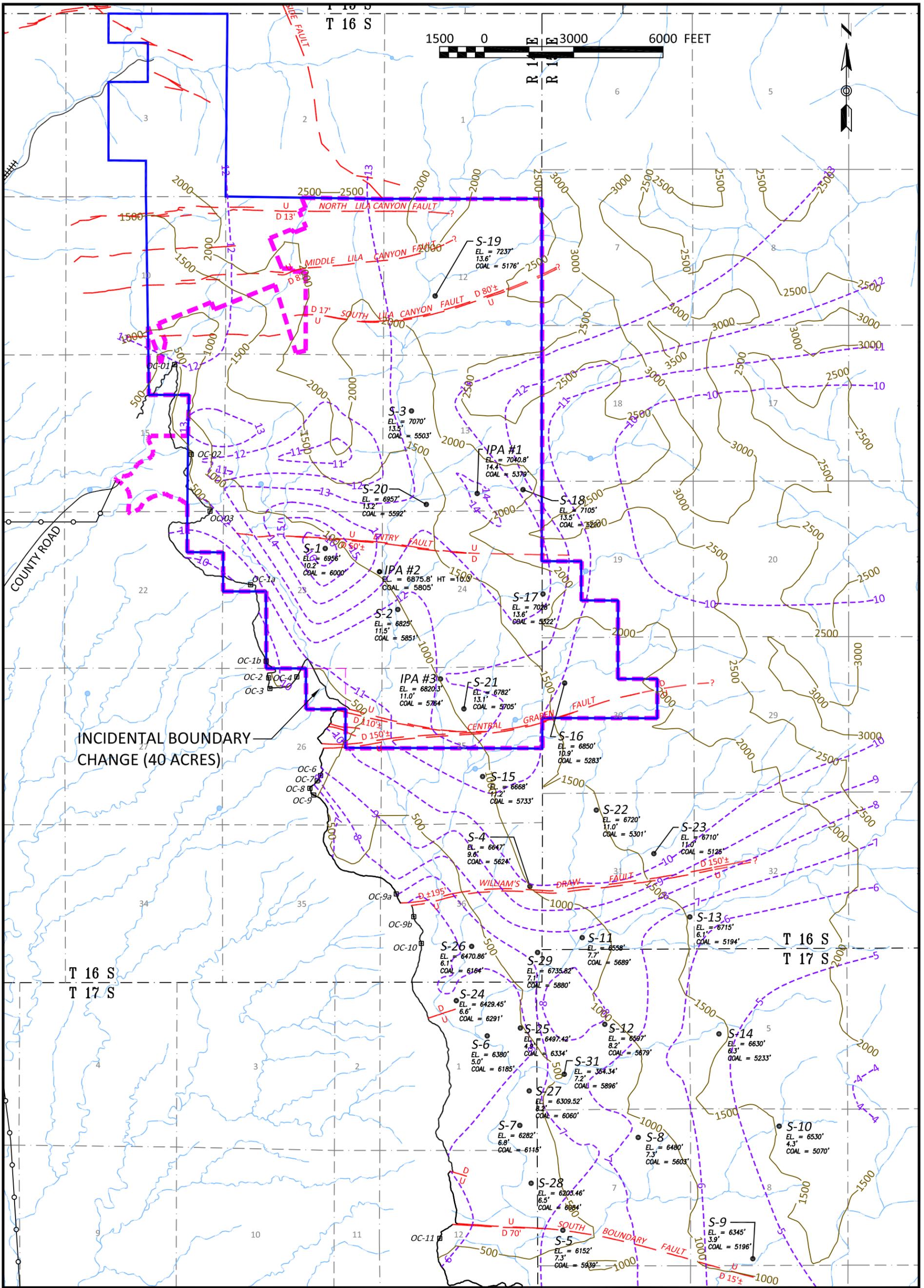
REVISIONS

DATE	BY
11/20/1999	BJ
08/29/2000	BJ
12/14/2000	BJ
APR. 19, 2002	RJM
SEPT. 20, 2002	RJM
DEC. 14, 2004	RJM
FEB. 8, 2016	PJJ
JUNE 1, 2016	PJJ

GENERAL GEOLOGY

LILA CANYON MINE
 23415 North Lila Canyon Road
 Green River, Utah 84525
 DOGM PERMIT# C0070013
 DESIGN BY: BLACKHAWK ENG.
 SCALE: 1" = 4,000'
 ORIGINAL DATE: JAN. 1998

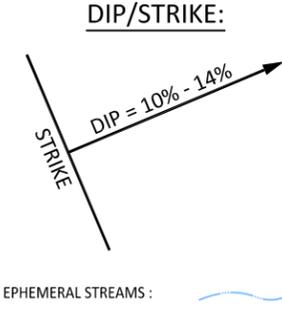
PLATE 6-2



INCIDENTAL BOUNDARY CHANGE (40 ACRES)

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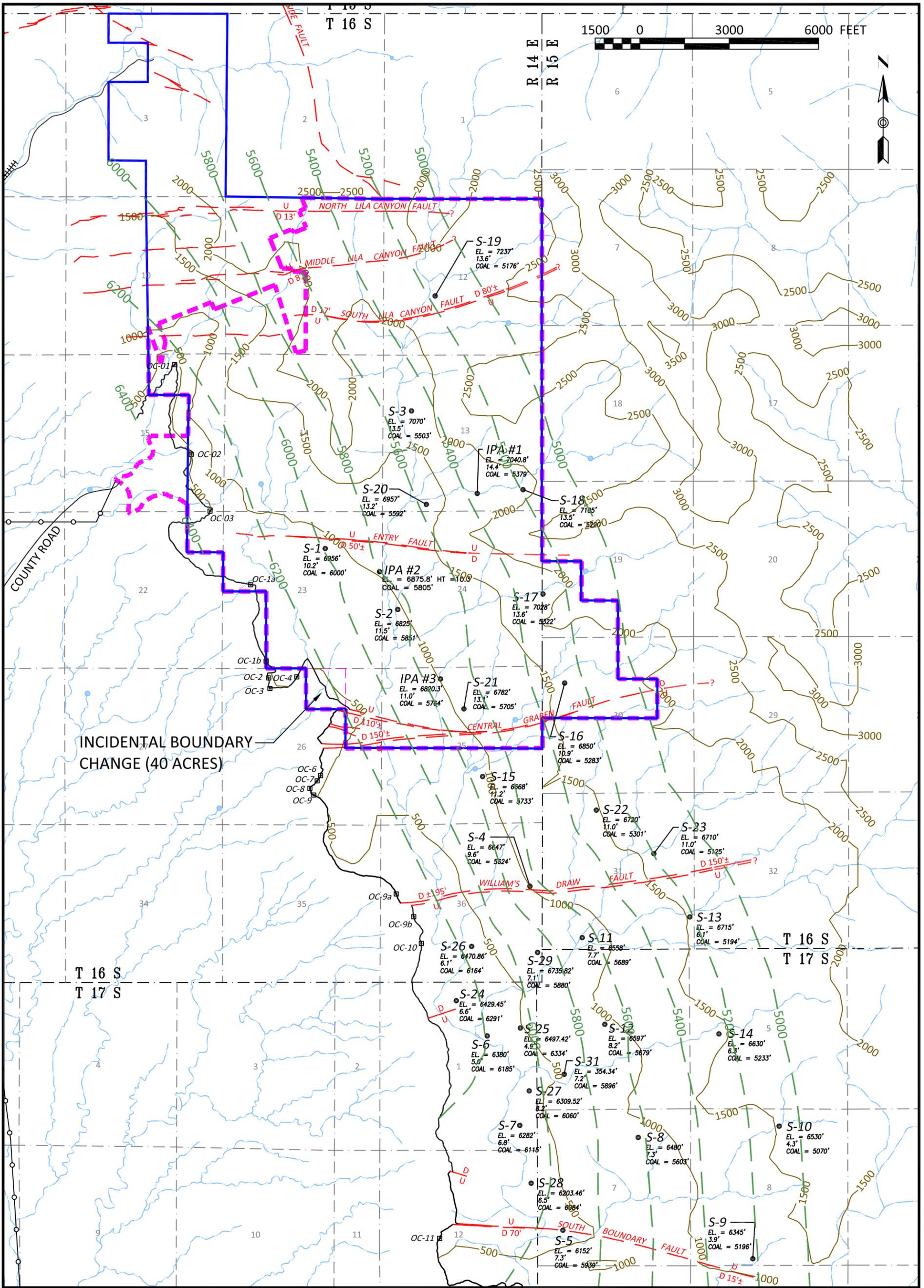
- PERMIT AREA :
- COAL OUTCROP :
- FAULTS :
- OUTCROP MEASUREMENTS : OC-11
- LMU AREA :
- DRILL HOLES : S-28
- SEAM THICKNESS ISOPACHS : (IN FEET)
- COVER (500' INTERVALS) : 1000'



REVISIONS	
DATE	BY
8/29/2000	BJ
12/14/2000	BJ
APR. 19, 2002	RJM
SEPT. 30, 2002	RJM
FEB. 8, 2016	PJJ
JUNE 1, 2016	PJJ

COAL THICKNESS ISOPACHS	
LILA CANYON MINE	
23415 North Lila Canyon Road Green River, Utah 84525	
DOG M PERMIT# C0070013	
DESIGN BY:	SCALE: 1" = 3,000'
BLACKHAWK ENG.	ORIGINAL DATE: JAN. 1998
PLATE 6-3	

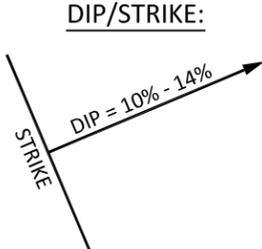
K:\Lila\2016\16-001 Ventilation Breakout and Removal of Part A and B References\Drawings\Plate 6-3 Coal Isopachs\Task 5081.dwg, Plate 6-3, 6/1/2016 2:12:34 PM, 1:1



INCIDENTAL BOUNDARY
CHANGE (40 ACRES)

LEGEND:

- PERMIT AREA :
- COAL OUTCROP :
- FAULTS :
- OUTCROP MEASUREMENTS : OC-11
- LMU AREA :
- DRILL HOLES : S-28
- STRUCTURE LINES :
- COVER (500' INTERVALS) :
- EPHEMERAL STREAMS :



REVISIONS	
DATE	BY
8/29/2000	BJ
12/14/2000	BJ
APR. 19, 2002	RJM
SEPT. 30, 2002	RJM
FEB. 8, 2016	PJJ
JUNE 1, 2016	PJJ

COVER AND STRUCTURE MAP

LILA CANYON MINE

23415 North Lila Canyon Road
Green River, Utah 84525

DOG M PERMIT# C0070013

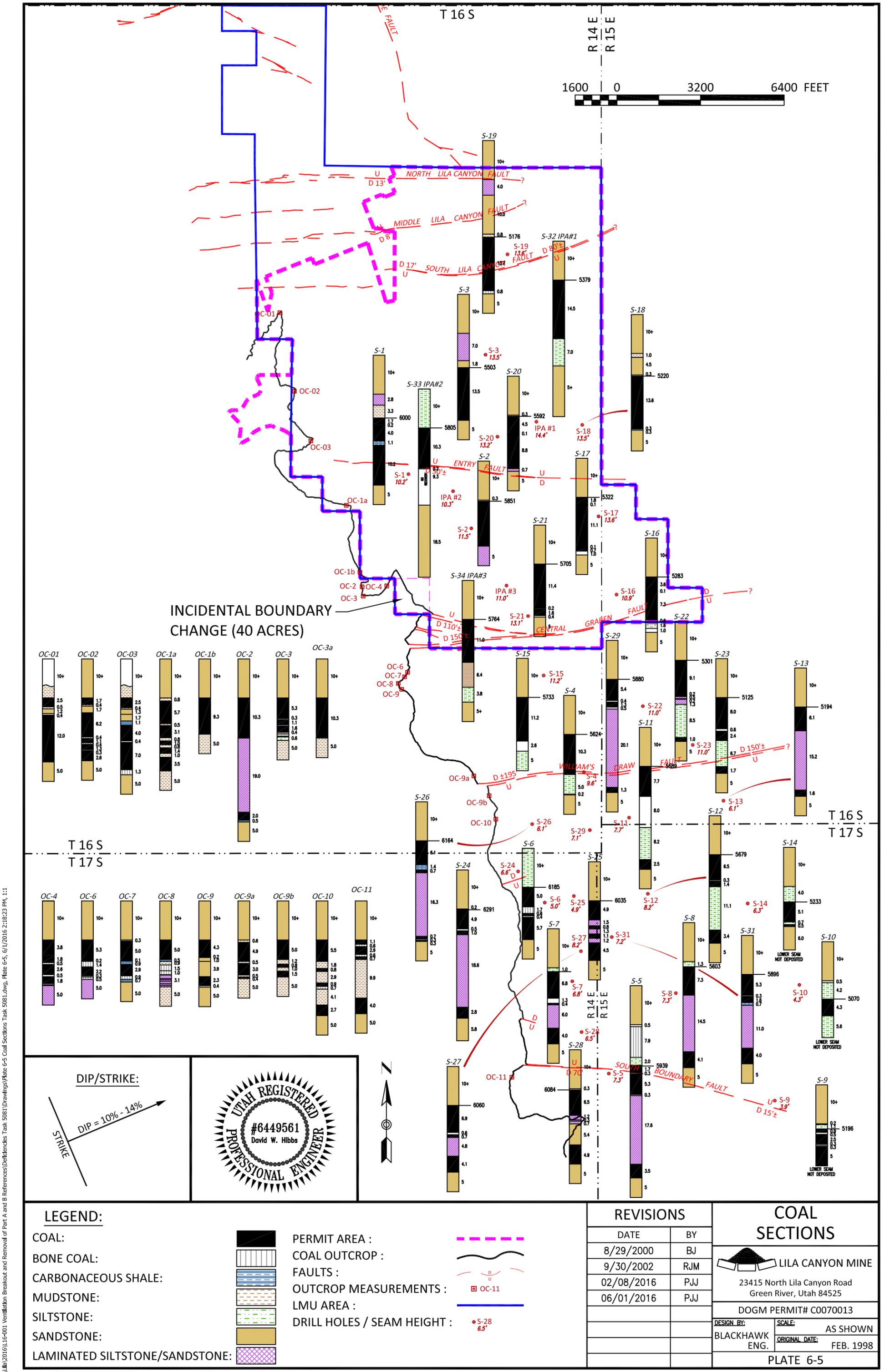
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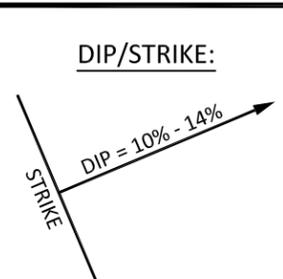
ORIGINAL DATE: JAN. 1998

PLATE 6-4

K:\Lila\2016\16-001 Ventilation Breakout and Removal of Part A and B References\Drawings\Plate 6-4 Cover and Structure Task 5081.dwg, Plate 6-4, 6/1/2016 2:15:17 PM, 1:1



K:\Lila\2016\16-001 Ventilation Breakout and Removal of Part A and B References\Drawings\Plate 6-5 Coal Sections Task 5081.dwg, Plate 6-5, 6/11/2016 2:18:23 PM, 1:1



LEGEND:

COAL:		PERMIT AREA :	
BONE COAL:		COAL OUTCROP :	
CARBONACEOUS SHALE:		FAULTS :	
MUDSTONE:		OUTCROP MEASUREMENTS :	
SILTSTONE:		LMU AREA :	
SANDSTONE:		DRILL HOLES / SEAM HEIGHT :	
LAMINATED SILTSTONE/SANDSTONE:			

REVISIONS	
DATE	BY
8/29/2000	BJ
9/30/2002	RJM
02/08/2016	PJJ
06/01/2016	PJJ

COAL SECTIONS

LILA CANYON MINE

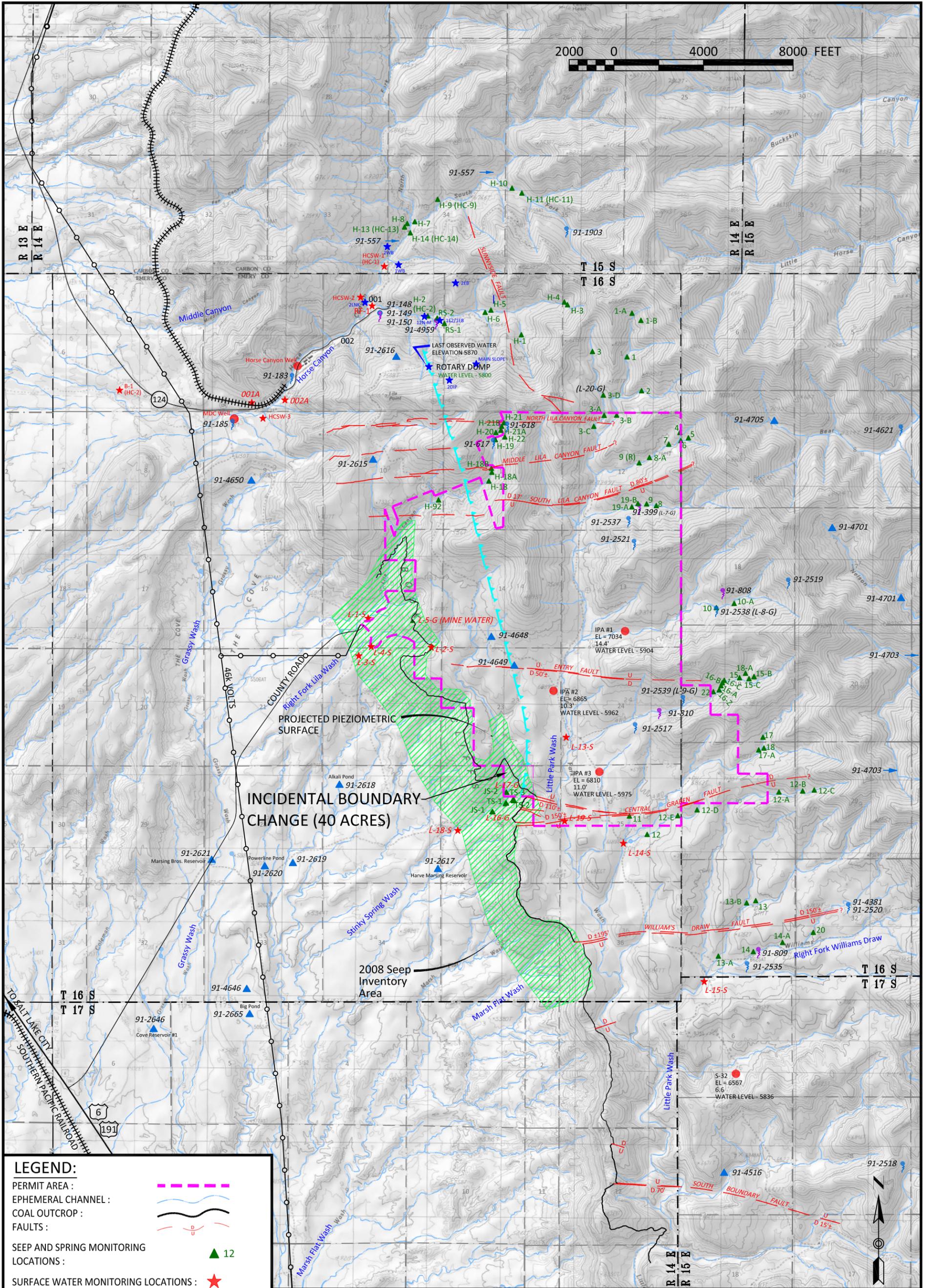
23415 North Lila Canyon Road
Green River, Utah 84525

DOG M PERMIT# C0070013

DESIGN BY:	SCALE:
BLACKHAWK ENG.	AS SHOWN
	ORIGINAL DATE:
	FEB. 1998

PLATE 6-5

2000 0 4000 8000 FEET



LEGEND:

- PERMIT AREA :
 - EPHEMERAL CHANNEL :
 - COAL OUTCROP :
 - FAULTS :
 - SEEP AND SPRING MONITORING LOCATIONS : 12
 - SURFACE WATER MONITORING LOCATIONS :
 - IN-MINE MONITORING LOCATIONS :
 - WELLS / PIEZOMETERS :
 - STOCK POND WATER RIGHT : 91-2646
 - UTAHAMERICAN, INC. WATER RIGHT : 91-810
 - NON-UTAHAMERICAN WATER RIGHT : 91-2535
 - UNDERGROUND WATER RIGHT : 91-48
- NOTE: SOME FAULT LINES NOT SHOWN FOR CLARITY.



REVISIONS

DATE	BY	DATE	BY
JULY 1999	WJ	DECEMBER 2006	PJJ
NOVEMBER 1999	BHE	JAN 12, 2007	RJM
MARCH 2000	BHE	FEB. 19, 2009	RJM
AUG. 2000	BJ	APRIL 2011	TJS
DEC. 2000	BJ	FEB. 8, 2016	PJJ
APRIL 2002	RJM	JUNE 1, 2016	PJJ
SEPTEMBER 2002	RJM		
NOVEMBER 2006	TJS		

PERMIT AREA HYDROLOGY

LILA CANYON MINE

23415 North Lila Canyon Road
Green River, Utah 84525

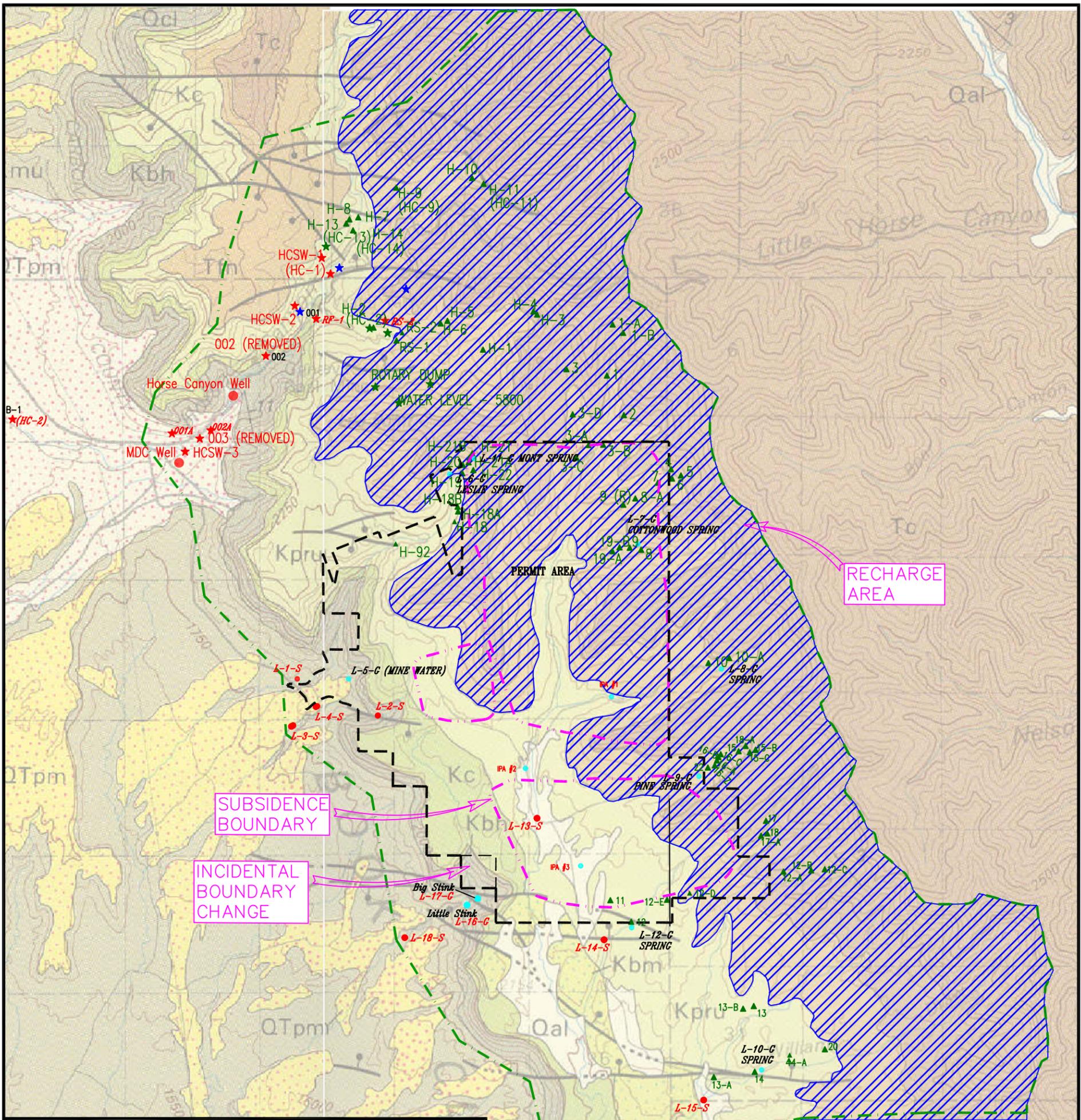
DOG M PERMIT# C0070013

DESIGN BY:	SCALE:	1" = 4,000'
BLACKHAWK ENG.	ORIGINAL DATE:	MAY 1998

PLATE 7-1

K:\Lila\2016\16-001 Ventilation Breakout and Removal of Part A and B References\Drawings\Plate 7-1 Permitt Area Hydrology Task 5081.dwg, Plate 7-1, 6/1/2016 2:11:16 PM, 1:1

K:\Lila\2016\16-001 Ventilation Breakout and Removal of Part A and B References\Deliverables Task 5081\Drawings\Plate 7-1a Permitt Hydrology Task 5081.dwg, Plate 7-1a, 6/1/2016 2:25:05 PM, 1:1



LEGEND

Qal	Alluvium	Kmeu	Upper sandstone unit
Qcl	Colluvium	Kmem	Middle shale unit
Qf	Alluvial fan deposit	Kmel	Lower sandstone unit
Qcf	Coalesced alluvial fan deposit	Kmbg	Blue Gate Member
Qsw	Slope wash	Kmbg	Garley Canyon Sandstone Member
QTpm	Pediment mantle	Kmf	Ferron Sandstone Member
Qt	Terrace deposit	Kmt	Tununk Member
Tg	Green River Formation	Kmu	Upper part of Mancos Shale, undivided
Tc	Colton Formation	Kmf	Ferron Sandstone Member
Tw	Wasatch Formation	Kmt	Tununk Member
Tfn	Flagstaff Member of Green River Formation and North Horn Formation	Jm	Morrison Formation
Kt	Tuscher Formation	Jmbb	Brushy Basin Member
Kfn	Farrer and Neslen Formations	Jms	Salt Wash Sandstone Member
Kmbb	Buck Tongue of Mancos Shale	Je	Summerville Formation
Kpru	Upper Part of Price River Formation	Jcu	Curtis Formation
Kbm	Bluecastle Sandstone Member	Je	Entrada Sandstone
Kc	Castlegate Sandstone	Jc	Carmel Formation
Kbh	Blackhawk Formation and Star	Jbn	Navajo Sandstone
Kmub	Upper part of Blue Gate Member	tk	Kayenta Formation
Kme	Emery Sandstone Member		

WATER MONITORING OLD/CURRENT

- ★ Horse Canyon Monitoring
- ★ Underground Horse Canyon Monitoring
- ▲ Baseline Springs
- Lila Canyon Ground Water Monitoring
- Lila Canyon Surface Monitoring
- ▨ Major Recharge Area
- EarthFax S&S Limits



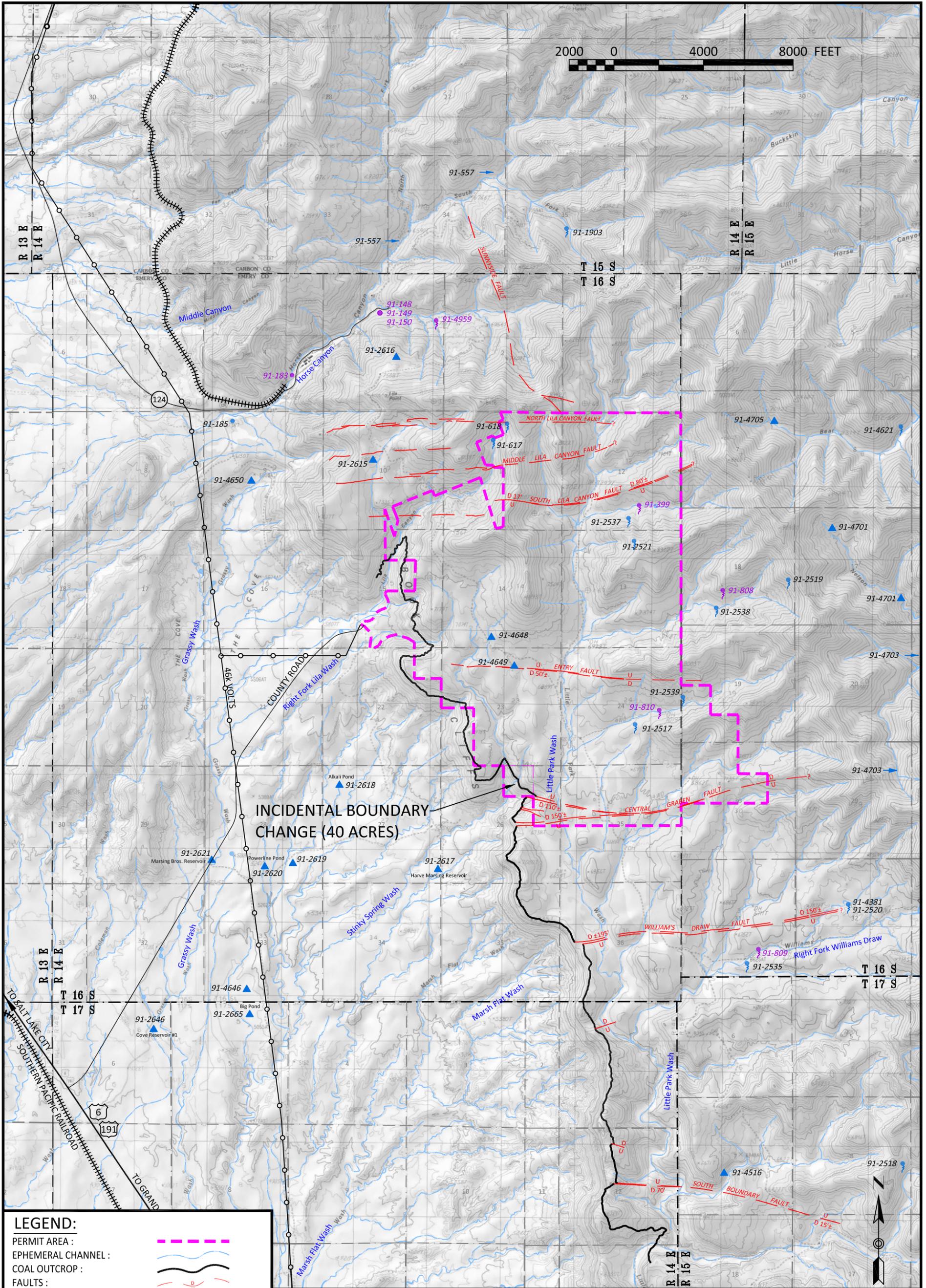
REVISIONS

DATE	BY
01/2006	
07/2006	
02/08/2016	PJJ
06/01/2016	PJJ

PERMIT AREA HYDROLOGY WITH GEOLOGIC MAP

LILA CANYON MINE
 23415 North Lila Canyon Road
 Green River, Utah 84525
 DOGM PERMIT# C0070013
 DESIGN BY: SCALE: 1" = 4,000'
 ORIGINAL DATE: NOV. 2002
PLATE 7-1A

2000 0 4000 8000 FEET



INCIDENTAL BOUNDARY
CHANGE (40 ACRES)

LEGEND:

- PERMIT AREA :
 - EPHEMERAL CHANNEL :
 - COAL OUTCROP :
 - FAULTS :
 - NON-UTAHAMERICAN WATER RIGHT : 91-557
 - UTAHAMERICAN WATER RIGHT : 91-810
 - RESERVOIR / STREAM :
 - SPRING SOURCE :
 - REACH OF CREEK :
 - UNDERGROUND SOURCE :
- NOTE: SOME FAULT LINES NOT SHOWN FOR CLARITY.



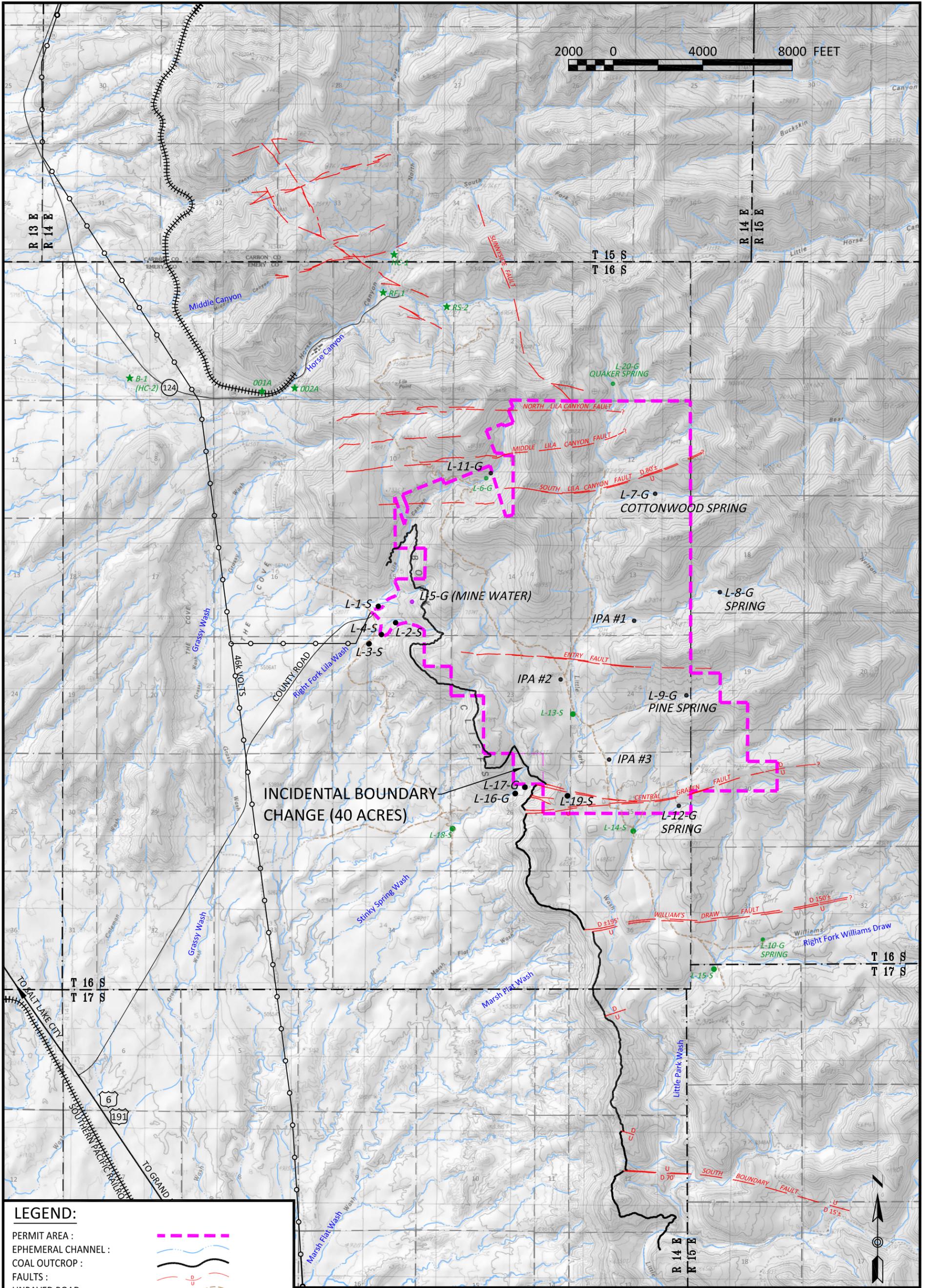
REVISIONS

DATE	BY	DATE	BY
NOVEMBER 1999	BHE	FEBRUARY 2016	PJJ
AUGUST 2000	BHE	JUNE 1, 2016	PJJ
DECEMBER 2000	BJ		
SEPTEMBER 2002	RJM		
NOVEMBER 2003	RJM		
JANUARY 2005	RJM		
NOVEMBER 2006	TJS		
NOVEMBER 2006	RJM		

WATER RIGHTS

LILA CANYON MINE
 23415 North Lila Canyon Road
 Green River, Utah 84525
 DOGM PERMIT# C0070013
 DESIGN BY: BLACKHAWK ENG. SCALE: 1" = 4,000'
 ORIGINAL DATE: MAY 1998

PLATE 7-3



INCIDENTAL BOUNDARY CHANGE (40 ACRES)

LEGEND:

- PERMIT AREA :
 - EPHEMERAL CHANNEL :
 - COAL OUTCROP :
 - FAULTS :
 - UNPAVED ROAD :
- | | | |
|--------------------------------------|--------|-----------|
| | ACTIVE | SUSPENDED |
| HORSE CANYON MONITORING : | ★ | ★ |
| LILA CANYON SURFACE MONITORING : | ● | ● |
| LILA CANYON GROUNDWATER MONITORING : | ● | ● |
| LILA CANYON CREST GAUGE MONITORING : | ■ | ■ |
| LILA CANYON SEEP LOCATIONS : | ▲ | ▲ |
| LILA CANYON RAIN GAUGE : | ▼ | ▼ |
- NOTE: SOME FAULT LINES NOT SHOWN FOR CLARITY.



REVISIONS

DATE	BY	DATE	BY
JULY 1999	WJ	JUNE 2011	TJS
NOVEMBER 1999	BHE	FEB. 8, 2016	PJJ
MARCH 2000	BHE	JUNE 1, 2016	PJJ
AUGUST 2000	BJ		
DECEMBER 2000	BJ		
JULY 2001	BJ		
SEPTEMBER 2002	RJM		
NOVEMBER 2006	TJS		

WATER MONITORING LOCATIONS

LILA CANYON MINE

23415 North Lila Canyon Road
Green River, Utah 84525

DOG M PERMIT# C0070013

DESIGN BY: BLACKHAWK ENG.	SCALE: 1" = 4,000' ORIGINAL DATE: MAY 1998
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PLATE 7-4