C/007/013 Incoming

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

#5081

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

February 8, 2016

RECEIVED
FEB 09, 2016
DIV. OF OIL, GAS & MINING

Attn: Dana Dean
Associate Director – Mining

Re: Lila Canyon Mine C/009/013
Incidental Boundary Change for a New Ventilation Breakout
Revise Text and Maps to Remove Part "A" from the MRP

Dear Ms. Dean,

Please find enclosed two (2) clean copies of maps and redlined strikeout text for an Incidental Boundary Change (IBC) application and revisions to the text and maps to remove Part "A" from the MRP to the above-referenced permit. This IBC is needed to allow for a new ventilation breakout to the outcrop just north of the Central Graben Fault, similar to those previously constructed at the Lila Canyon Mine.

We have also reduced the submitted drawings to 11"x17" size, in lieu of the larger size of the previously submitted drawings, so the maps will be easier to handle. Unless noted, the data has not changed between the larger and smaller sheets. We have also surrounded the revisions on each plate with a revision cloud to highlight the location of the IBC and revision to the permit area. Additionally, a USGS topographic map has been underlain below the map data where appropriate for reference purposes.

As you review this application, we ask that you please consider the following points:

1. This IBC would allow for the development of a new ventilation breakout to the coal outcrop for the life of the Lila Canyon Mine just north of the Central Graben Fault. The ventilation breakout will consist of two (2) portals driven from underground. All work will be performed from the underground mine workings, with no surface disturbances other than the openings themselves. Topsoil, berms and sediment control will be handled in a similar fashion to the existing South Breakout.

2. Longwall mining is currently not planned to be associated with this IBC, although the development of the new ventilation breakout is critical to the future longwall mining projected in the general area of the mine.

3. This IBC will add forty (40) acres to the permit area, which is less than 1% of the currently approved 5,992 acres, bringing the new total permit area to 6,032 acres.

4. Development mining for the new ventilation breakout will be performed in less than 700' of cover.

5. The new ventilation breakout will have insignificant surface disturbance, similar to the existing South Breakout, as all work will be performed through the underground mine workings. No surface roads or power lines are required for the breakout.

6. The ventilation breakout is not projected to occur under the nearby ephemeral drainage channels, and will not disturb the nearby Big and Little Stinky Springs. The new Plate 5-2a (IBC Area – Graben Breakout) depicts the projected location of the breakout to the coal outcrop. The actual location of the breakout may vary from the drawing due to geologic conditions that may be encountered during underground mining operations. The breakout is intended to be located as near as practical to the Central Graben Fault. As-built drawings will be provided upon completion of the breakout.

7. All of the surface and coal resources within this IBC are owned by the Bureau of Land Management (BLM), and are currently leased to UtahAmerican Energy, Inc. under Federal Lease #SL-066490. The BLM has recently approved the R2P2 to allow development of the new ventilation breakout.

8. The last aerial raptor survey in 2015 did not note any raptors in the general area of the new breakout. A new survey will be performed in May of this year (2016). The results of this survey will be reported to your office as soon as the data is available.

9. An archeological survey of the area will be performed as soon as weather permits. The results of said survey will the reported to your office as soon as the data is available.

10. The area has been included in the seep and spring surveys as shown in the submitted MRP drawings.

Due to the critical nature of these breakouts for the ventilation of the mine, we request an expedited review of this application. At current production rates, we project crossing into this IBC in the third quarter of this year (2016).

If you have any comments or questions, please feel free to contact PJ Jensen by telephone at (435) 888-4018, or by email at pjensen@coalsource.com , or at the address above.

Thank you for your time and attention.

Sincerely,

Karin Madsen
Resident Agent

APPLICATION FOR PERMIT PROCESSING

Permit Change X	New Permit ☐	Renewal ☐	Transfer ☐	Exploration ☐	Bond Release ☐	Permit Number: ACT/007/013
L16-001 Lila Canyon Incidental Boundary Change for New Ventilation Breakout						Mine: Lila Canyon
						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*

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

X Attach 2 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.

Karin Madsen / Engineering Tech / 2-8-16
Signed - Name - Position - Date

Subscribed and sworn to before me this 9th day of February, ~~19~~ 2016

Notary Public

My Commission Expires: March 27, ~~19~~ 2017
Attest: STATE OF Utah
COUNTY OF Carbon

LINDA KERNS
NOTARY PUBLIC • STATE of UTAH
COMMISSION # 683615
COMM. EXP. 03/27/2017

Received by Oil, Gas & Mining
RECEIVED
FEB 09 2016
DIV. OF 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	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
☐ ADD	☐ REPLACE	☐ REMOVE	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
☐ ADD	☐ REPLACE	☐ REMOVE	Chapter 1 page 15
☐ ADD	☐ REPLACE	☐ REMOVE	Chapter 5 pages 19, 20, 22, 33, 46, and 65
☐ ADD	☐ REPLACE	☐ REMOVE	Chapter 7 pages 5, and 12
☐ ADD	☐ REPLACE	☐ REMOVE	

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

RECEIVED

FEB 09 2016

DIV. OF OIL, GAS & MINING

LILA CANYON MINE

009/013

CHANGE TO THE MINING AND RECLAMATION PLAN

INCIDENTAL BOUNDARY CHANGE (40 ACRES)

TO ALLOW THE DEVELOPMENT OF A NEW VENTILATION BREAKOUT

NOTES TO REVIEWERS:

1. UNDER THIS APPLICATION, NO MINING IS PROJECTED TO BE UNDER NEARBY EPHEMERAL CHANNELS.

2. UNDER THIS APPLICATION, SURFACE DISTURBANCE WILL BE INSIGNIFICANT (SIMILAR TO THE EXISTING SOUTH BREAKOUT).

3. UNDER THIS APPLICATION, DEVELOPMENT MINING ONLY IS PROJECTED IN THE IBC AREA.

RECEIVED
FEB 09 2016
DIV. OF OIL, GAS & MINING

SUBMITTED: FEBRUARY 8, 2016

Chapter 1

Revisions

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 permittee area and proposed disturbed area boundaries.

~~This permit extension io intended to add the Lila Canyon Mine as 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.~~

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.

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Chapter 5

Revisions

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

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 Doellng 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~~except those used as part of the Lila Canyon ~~Mine, Part "B"~~mining operation.

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~~except those used as part of the mining operation.

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.

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~~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.

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:

- Formation of surface fissures which intercept near surface soil moisture thus draining the water away from the root zone with deleterious effects.

- Alterations in ground slope and destabilization of critical slopes and cliffs.

- Modification of surface hydrology due to the general downward migration of surface water through vertical fractures.

- 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.

- 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,

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 oil 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

"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 to 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

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

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.

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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 Doellng 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.

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521.121 There are no buildings within 1000 feet of the proposed permit area except those used as part of the Lila Canyon mining operation.

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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 except those used as part of the mining operation.

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.

proposed permit area.

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. This section does not apply.

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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.

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.

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in Chapter 7 Section 731.211. UEI has committed to provide for mitigation of any lost water rights as per Chapter 7 Section 727.

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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 oil 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.

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as well as enhance revegetation establishment. It is not anticipated that soil will be disturbed in areas to steep for equipment to operate.

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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.

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.

Chapter 7

Revisions

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

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 (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 Kalser 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.

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.

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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.

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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.

PERMIT AREA

PERMIT AREA

INCIDENTAL BOUNDARY CHANGE (40 ACRES)

T 15 S
T 16 S

T 16 S
T 17 S

R 13 E
R 14 E

R 14 E
R 15 E

CARBON COUNTY RAILROAD

COUNTY ROAD

46k VOLTS

TO SALT LAKE CITY

TO GRAND JUNCTION

SOUTHERN PACIFIC RAILROAD

2000 0 4000 8000 FEET

LEGEND:

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.

RECEIVED
FEB 09 2016
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I CERTIFY THIS MAP TO BE TRUE AND CORRECT TO THE BEST OF MY KNOWLEDGE.

UTAH REGISTERED
#6449561
David W. Hibbs
2/8/16
PROFESSIONAL ENGINEER

REVISIONS	
DATE	BY
12/13/2000	BJ
10/02/2002	RJM
02/08/2016	PJJ

PERMIT AREA MAP

LILA CANYON MINE

23415 North Lila Canyon Road
Green River, Utah 84525

DOGM PERMIT# C0070013

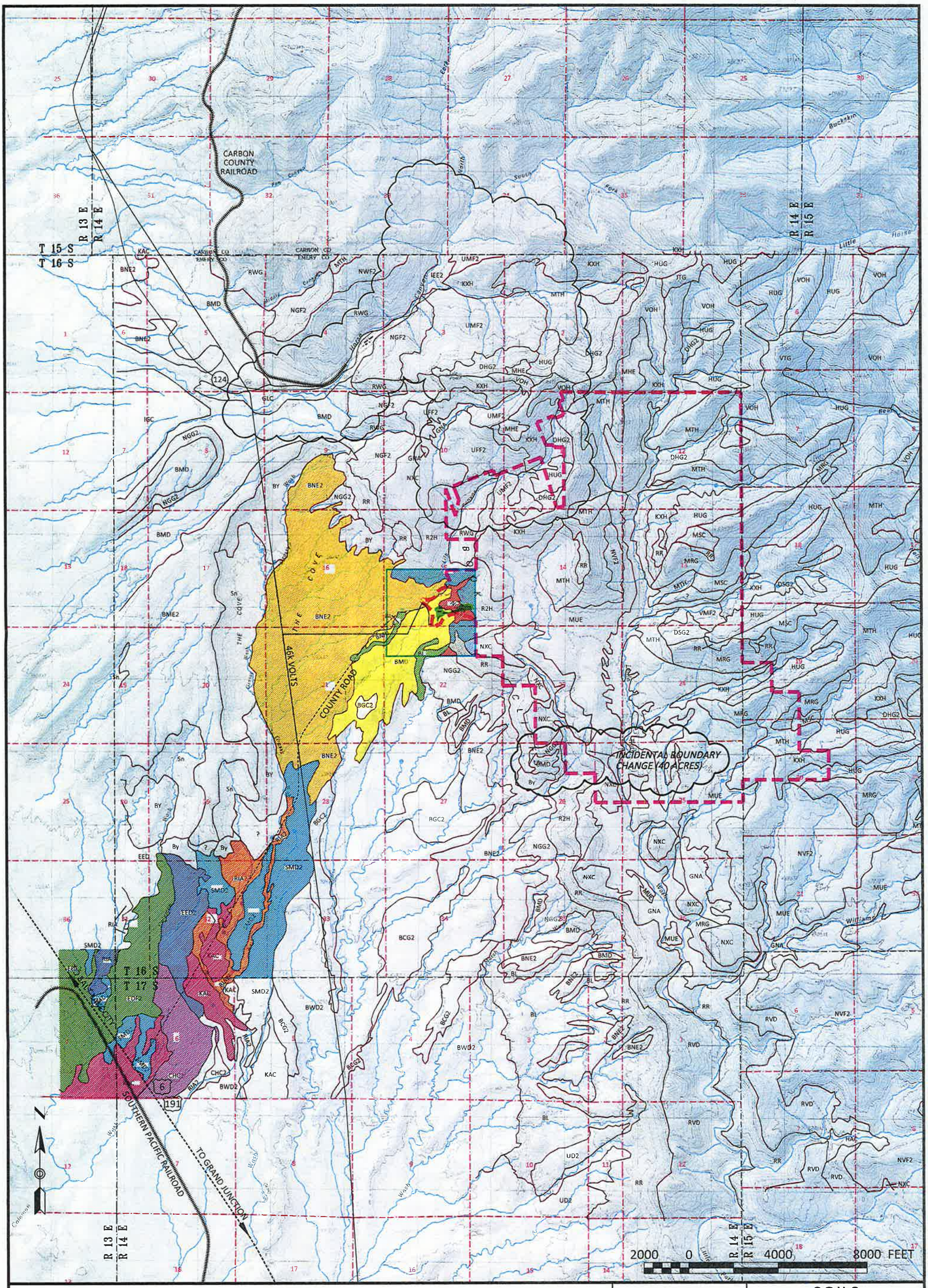
DESIGN BY: EIS

SCALE: 1" = 4,000'

ORIGINAL DATE: SEPT. 2000

PLATE 1-1

G:\Current Drawings\MRP Maps\Lila Canyon\LBC Sect 26 Breakouts\Plate 1-1 Permit Area Map 01-2016.dwg, Plate 1-1, 2/5/2016 12:36:38 PM, 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

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REVISIONS	
DATE	BY
JAN. 2008	RJM
DEC. 2010	RJM
02/08/2016	PJJ

SOILS 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: MAY 1998

PLATE 2-1

G:\Current Drawings\MRP Maps\Lila Canyon\LBC Sect 26 Breakouts\Plate 2-1 Soils Map 01-2016.dwg, Plate 2-1, 2/5/2016 12:40:12 PM, 1:1

2000 0 4000 8000 FEET

R 13 E
R 14 E

CARBON COUNTY RAILROAD

CARBON CR
EMERY CO

R 14 E
R 15 E

T 15 S
T 16 S

Canyon
Buckskin
Little Horse
Bear
Williams

124

46k VOLTS

COUNTY ROAD

BOOK CLIFFS

INCIDENTAL BOUNDARY CHANGE (40 ACRES)

T 16 S
T 17 S

TO SALT LAKE CITY

6
191

SOUTHERN PACIFIC RAILROAD

TO GRAND JUNCTION

R 13 E
R 14 E

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

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DATE	BY
11 NOV. 1999	RJM
29 AUG. 2000	BJ
14 DEC. 2000	BJ
SEPT. 2002	RJM
APR. 2003	RJM
FEB. 8, 2016	PJJ

WILDLIFE HABITAT:
BIG HORN SHEEP / PRONGHORN ANTELOPE

LILA CANYON MINE

23415 North Lila Canyon Road
Green River, Utah 84525

DOGM PERMIT# C0070013

DESIGN BY: EIS
SCALE: 1" = 4,000'
ORIGINAL DATE: SEPT. 2000

PLATE 3-1B

G:\Current Drawings\MRP Maps\Lila Canyon\IBC Sect 26 Breakouts\Plate 3-1 Wildlife Habitat Confidential 01-2016.dwg, 3-1B SHEEP ANTELOPE, 2/5/2016 12:41:52 PM, 1:1

2000 0 4000 8000 FEET

R 13 E
R 14 E

CARBON COUNTY RAILROAD

CARBON CO
EMERY CO

T 15 S
T 16 S

R 14 E
R 15 E

INCIDENTAL BOUNDARY CHANGE (40 ACRES)

46k VOLTS

COUNTY ROAD

T 16 S
T 17 S

TO SALT LAKE CITY

SOUTHERN PACIFIC RAILROAD

TO GRAND JUNCTION

R 13 E
R 14 E

R 14 E
R 15 E

LEGEND:

- Elk Winter Habitat
- Elk Summer Habitat
- Permit Line

2000 0 4000 8000 FEET

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DATE	BY
11 NOV. 1999	RJM
29 AUG. 2000	BJ
14 DEC. 2000	BJ
SEPT. 2002	RJM
APR. 2003	RJM
FEB. 8, 2016	PJJ

WILDLIFE HABITAT: *ELK*

LILA CANYON MINE

23415 North Lila Canyon Road
Green River, Utah 84525

DOGM PERMIT# C0070013

DESIGN BY: EIS

SCALE: 1" = 4,000'

ORIGINAL DATE: SEPT. 2000

PLATE 3-1C

G:\Current Drawings\MRP Maps\Lila Canyon\IBC Sect 26 Breakouts\Plate 3-1 Wildlife Habitat Confidential 01-2016.dwg, 3-1C ELK, 2/5/2016 12:42:01 PM, 1:1

2000 0 4000 8000 FEET

R 13 E
R 14 E

CARBON COUNTY RAILROAD

CARBON CO
EMERY CO

T 15 S
T 16 S

R 14 E
R 15 E

124

46k VOLTS

COUNTY ROAD

INCIDENTAL BOUNDARY CHANGE (40 ACRES)

T 16 S
T 17 S

TO SALT LAKE CITY

6
191

SOUTHERN PACIFIC RAILROAD

TO GRAND JUNCTION

R 13 E
R 14 E

R 14 E
R 15 E

LEGEND:

- Mule Deer Critical Habitat
- Mule Deer Yearlong Habitat
- Permit Line

2000 0 4000 8000 FEET

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David W. Hibbs
2/5/16
PROFESSIONAL ENGINEER

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

WILDLIFE HABITAT
MULE DEER

LILA CANYON MINE

23415 North Lila Canyon Road
Green River, Utah 84525

DOGM PERMIT# C0070013

DESIGN BY: EIS
SCALE: 1" = 4,000'
ORIGINAL DATE: SEPT. 2000

PLATE 3-1D

G:\Current Drawings\MRP Maps\Lila Canyon\LBC Sect 26 Breakouts\Plate 3-1 Wildlife Habitat Confidential 01-2016.dwg, 3-1D DEER, 2/5/2016 12:42:10 PM, 1:1

T 15 S
T 16 S

R 14 E
R 15 E

Mixed Conifer Mountain Brush
Grass
Spruce/Fir
Pinion/Juniper
Sagebrush/Grass
Sagebrush Grass
Salt Desert Shale

1) L-11-G
1) L-6-G
1) L-7-G
2) L-8-G
3) L-9-G
3) L-12-G
4) L-17-G
4) L-16-G
5) L-14-S
5) L-1-S
5) L-5-G
5) L-4-S
5) L-2-S
5) L-3-S
5) L-13-S

INCIDENTAL BOUNDARY CHANGE (40 ACRES)

T 16 S
T 17 S

1500 0 3000 6000 FEET

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G:\Current Drawings\MRP Maps\Lila Canyon\IBC Sect 26 Breakouts\Plate 3-2 Vegetation Map 01-2016.dwg, Plate 3-2, 2/5/2016 1:44:32 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

VEGETATION MAP

LILA CANYON MINE
23413 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

BRONCO COAL CO. 80 ACRES
BRONCO COAL CO. 120 ACRES
BRONCO COAL CO. 280 ACRES
BRONCO COAL CO. 280 ACRES
BRONCO COAL CO. 360 ACRES
ROBERT K. PEPER 120 ACRES
CEUF 166.06 ACRES
STATE OF UTAH
STATE OF UTAH
U.S. STEEL 2.75 ACRES
CEUF (SURFACE AND MINERAL)
CEUF SURFACE
UEI SURFACE
JOSIAH K. EARDLEY 520 ACRES
UEI (SURFACE) 160 ACRES
WILLIAM MARSING LIVESTOCK, INC. 640 ACRES
PERMIT AREA
PERMIT AREA
INCIDENTAL BOUNDARY CHANGE (40 ACRES)
46k VOLTS
COUNTY ROAD
TO SALT LAKE CITY
STATE OF UTAH 640 ACRES
STATE OF UTAH 640 ACRES
STATE OF UTAH 640 ACRES
R 13 E / R 14 E
R 14 E / R 15 E
T 15 S / T 16 S
T 16 S / T 17 S

KEYED PROPERTY NOTES

1. CEUF (SURFACE AND MINERAL) 80 ACRES
2. CEUF (SURFACE AND MINERAL) 40 ACRES
3. EMERY COUNTY 77.25 ACRES
4. CEUF (SURFACE AND MINERAL) 231.85 ACRES
5. CEUF (SURFACE AND MINERAL) 114.82 ACRES
6. STATE OF UTAH 40 ACRES
7. UEI (SURFACE) 160 ACRES
8. STATE OF UTAH 80 ACRES
9. WILLIAM MARSING LIVESTOCK, INC. 120 ACRES
10. WILLIAM MARSING LIVESTOCK, INC. 400 ACRES
11. UEI (SURFACE AND MINERAL) 80 ACRES
12. UEI (SURFACE AND MINERAL) 40 ACRES
13. UEI (SURFACE AND MINERAL) 35.41 ACRES

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LEGEND:

ALL LANDS OWNED BY BUREAU OF LAND MANAGEMENT UNLESS NOTED OTHERWISE.

PERMIT AREA :
- Emery County
- Brent M. Davies (Bronco Coal Co.)
- Josiah K. Eardley
- CEUF
- UtahAmerican Energy, Inc.
- W. Marsing Livestock, Inc.
- Robert K. Peper
- U.S. Steel
- State of Utah

UTAH REGISTERED #6449561 David W. Hibbs 2/8/16 PROFESSIONAL ENGINEER

REVISIONS	
DATE	BY
AUG. 2000	BJ
DEC. 2000	BJ
SEPT. 2002	RJM
AUG. 2003	RJM
DEC. 2005	RJM
FEB. 8, 2016	PJJ

SURFACE OWNERSHIP

LILA CANYON MINE
23415 North Lila Canyon Road
Green River, Utah 84525

DOGM PERMIT# C0070013

DESIGN BY: EIS
SCALE: 1" = 4,000'
ORIGINAL DATE: JULY 1999

PLATE 4-1

G:\Current Drawings\MRP Maps\Lila Canyon\LBC Sect 26 Breakouts\Plate 4-1 Surface Ownership 01-2016.dwg, Plate 4-1, 2/5/2016 1:45:45 PM, 1:1

2000 0 4000 8000 FEET

Columbia Allotment

Non-Allotted

Patmos Allotment

Fan Canyon Allotment

Range Creek Allotment

Icelander Allotment

PERMIT AREA

PERMIT AREA

INCIDENTAL BOUNDARY CHANGE (40 ACRES)

Little Park Allotment

Cove Allotment

Coon Springs Allotment

Woodside Allotment

T 15 S
T 16 S

T 16 S
T 17 S

R 13 E
R 14 E
R 15 E

SOUTHERN PACIFIC RAILROAD

TO GRAND JUNCTION

TO SALT LAKE CITY

COUNTY ROAD

THE COVE

LITTLE BOOK CLIFFS

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LEGEND:

PERMIT AREA :

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

UTAH REGISTERED
#6449561
David W. Hibbs
2/5/16
PROFESSIONAL ENGINEER

REVISIONS	
DATE	BY
AUG. 29, 2000	BJ
DEC. 14, 2000	BJ
SEPT. 19, 2002	RJM
FEB. 8, 2016	PJJ

GRAZING ALLOTMENTS

LILA CANYON MINE

23415 North Lila Canyon Road
Green River, Utah 84525

DOGM PERMIT# C0070013

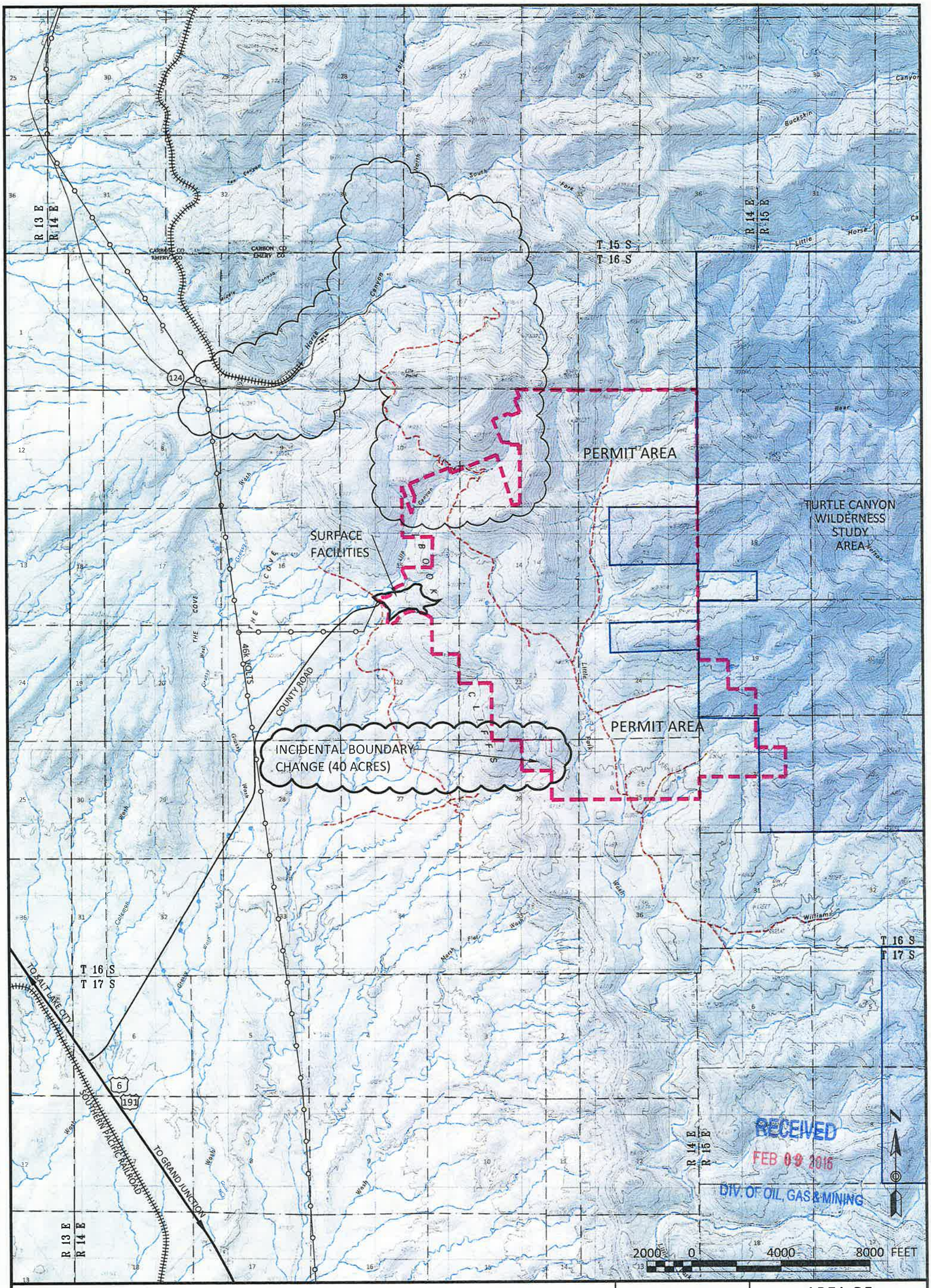
DESIGN BY: EIS

SCALE: 1" = 4,000'

ORIGINAL DATE: APRIL 1998

PLATE 4-2

G:\Current Drawings\MRP Maps\Lila Canyon\IBC Sect 26 Breakouts\Plate 4-2 Grazing Allotments 01-2016.dwg, Plate 4-2, 2/5/2016 1:47:03 PM, 1:1



LEGEND:

TURTLE CANYON WSA :

PERMIT AREA :

EPHEMERAL STREAM :

UTAH REGISTERED
#6449561
David W. Hibbs
2/8/16
PROFESSIONAL ENGINEER

REVISIONS	
DATE	BY
12/2000	BJ
09/2002	RJM
02/08/2016	PJJ

AREA OF WILDERNESS CHARACTER

LILA CANYON MINE

23415 North Lila Canyon Road
Green River, Utah 84525

DOGM PERMIT# C0070013

DESIGN BY: EIS

SCALE: 1" = 4,000'

ORIGINAL DATE: SEPT. 2000

PLATE 4-4

G:\Current Drawings\MRP Maps\Lila Canyon\IBC Sect 26 Breakouts\Plate 4-4 Wilderness Character 01-2016.dwg, Plate 4-4, 2/5/2016 1:49:10 PM, 1:1

1500 0 3000 6000 FEET

N

R 14 E
R 15 E

T 15 S
T 16 S

CARBON COUNTY RAILROAD

124

1971
1972
1980
1980
1976
1980's
1953-1971
1953-1971
1979
1979
1947-1962
1947-1954
1968
1980
1951-1955
1949-1962
1940's
1977
5800.00
1951-1976
5798.61
Exploration Entries
5855.00
Existing Little Park Road
Old Book Cliff Mine
46K Volts
Limit of Old Works
PERMIT AREA
PERMIT AREA
COUNTY ROAD
INCIDENTAL BOUNDARY CHANGE (40 ACRES)

T 16 S
T 17 S

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G:\Current Drawings\MRP Maps\Lila Canyon\IBC Sect 26 Breakouts\Plate 5-1 Previously Mined Areas 01-2016.dwg, Plate 5-1, 2/5/2016 1:50:39 PM, 1:1

LEGEND:

- PERMIT AREA :
- EXISTING ROADS :
- LIMIT OF OLD WORKS :
- BOOK CLIFFS COAL COMPANY :
- EXPLORATION ENTRIES :
- EPHEMERAL STREAMS :

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#6449561
David W. Hibbs
PROFESSIONAL ENGINEER

REVISIONS	
DATE	BY
8/29/2000	BJ
12/14/2000	BJ
09/20/2002	RJM
12/29/2004	RJM
02/08/2016	PJJ

PREVIOUSLY MINED AREAS

LILA CANYON MINE

23415 North Lila Canyon Road
Green River, Utah 84525

DOGM PERMIT# C0070013

DESIGN BY: EIS

SCALE: 1" = 3,000'

ORIGINAL DATE: MAY 1998

PLATE 5-1

TYPICAL EPHEMERAL CHANNELS

FUTURE 1st SOUTH

FUTURE LONGWALL PANEL #4

FUTURE 2nd SOUTH

FUTURE LONGWALL PANEL #5

FEDERAL LEASE #SL-066490

U D D U U D D U ?

EXISTING PERMIT LINE

TYPICAL LEASE LINE

INCIDENTAL BOUNDARY CHANGE (40 ACRES)

COAL OUTCROP

PROPOSED NEW PERMIT LINE

FUTURE GRABEN BREAKOUT

L-17-G (BIG STINKY SPRING)

A.S.C.A.

BLEEDER TO BE DETERMINED

U D 110'± CENTRAL GRABEN FAULT

N

L-16-6 (LITTLE STINKY SPRING)

U D U D 150'± U

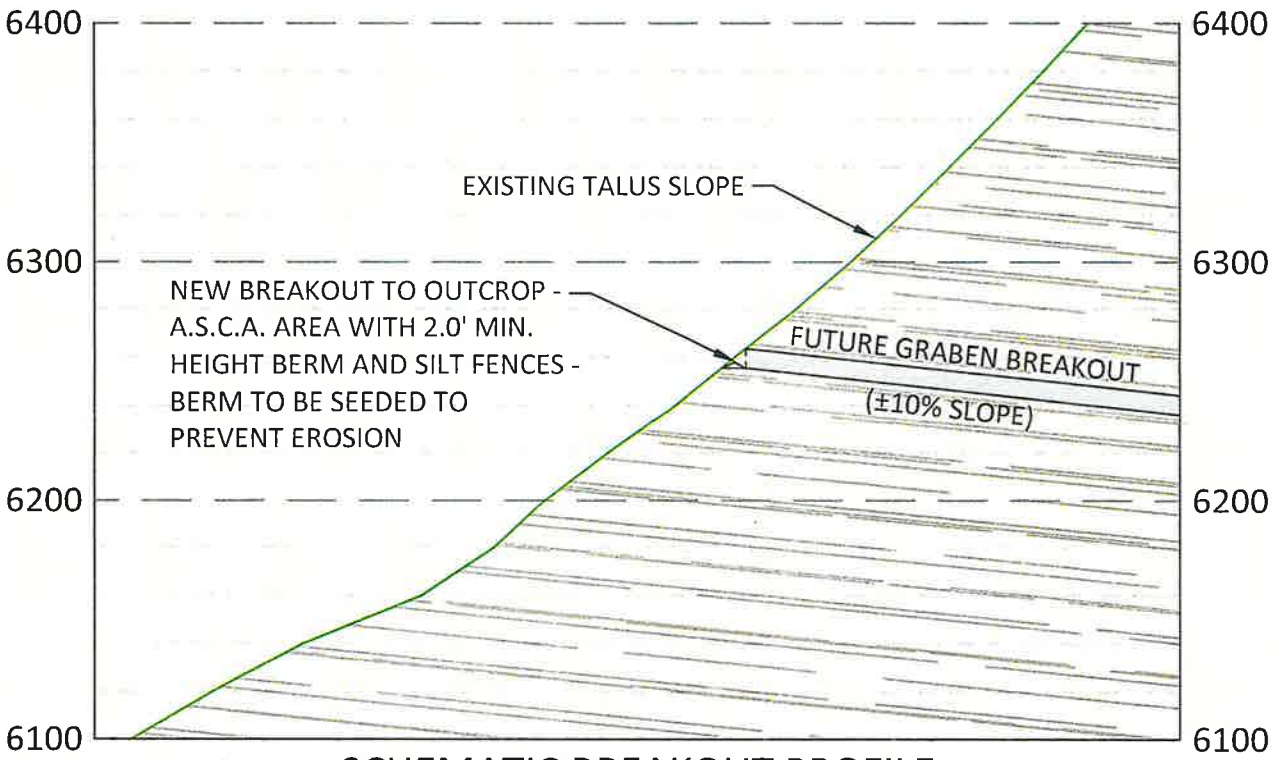
COAL OUTCROP

FEDERAL LEASE #SL-069291

UNLEASED AREA

NOTE:
THE LOCATION OF THE VENTILATION BREAKOUT IS DEPENDENT UPON UNDERGROUND CONDITIONS ENCOUNTERED DURING MINING. THE BREAKOUT ENTRIES AND BLEEDER ENTRIES WILL BE DEVELOPED AS CLOSE AS IS PRACTICAL TO THE CENTRAL GRABEN FAULT. AS-BUILT DRAWINGS WILL BE PROVIDED UPON COMPLETION OF THE BREAKOUT.

250 0 500 1000 FEET



SCHEMATIC BREAKOUT PROFILE

40 0 80 160 FEET

RECEIVED
FEB 09 2016
DIV. OF OIL, GAS & MINING

LEGEND:

PERMIT AREA :
EPHEMERAL CHANNEL :
COAL OUTCROP :
FAULTS :
200' OUTCROP BARRIER :
SPRING LOCATION :
TYPICAL FUTURE MINING : (UNDERGROUND)

UTAH REGISTERED #6449561 David W. Hibbs 2/5/16 PROFESSIONAL ENGINEER

REVISIONS	
DATE	BY

IBC AREA - GRABEN BREAKOUT

LILA CANYON MINE
23415 North Lila Canyon Road
Green River, Utah 84525

DOGM PERMIT# C0070013

DESIGN BY: UEI
SCALE: AS SHOWN
ORIGINAL DATE: 8 FEB. 2016

PLATE 5-2a

G:\Current Drawings\MRP Maps\Lila Canyon\IBC Sect 26 Breakouts\Plate 5-2a Central Graben Breakout 01-2016.dwg, Plate 5-2a, 2/5/2016 2:08:14 PM, 1:1

1000 0 2000 4000 FEET

EXISTING
HORSE CANYON
MINE WORKINGS

PANEL #1
PANEL #2
PANEL #3
PANEL #4
PANEL #5
PANEL #6
PANEL #7
PANEL #8
PANEL #9
PANEL #10
PANEL #11
PANEL #12
PANEL #13
PANEL #14
PANEL #15
PANEL #16
PANEL #17
PANEL #18
PANEL #19
PANEL #20
PANEL #21
PANEL #22
PANEL #23
PANEL #24

NORTH LILA CANYON FAULT
SOUTH LILA CANYON FAULT
ENTRY FAULT

INCIDENTAL
BOUNDARY
CHANGE
(40 ACRES)

TURTLE CANYON
WILDERNESS
STUDY AREA

R 14 E
R 15 E

N

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 : ⊗

UTAH REGISTERED
#6449561
David W. Hibbs
2/8/16
PROFESSIONAL ENGINEER

REVISIONS

DATE	BY	DATE	BY
NOV. 20, 1999	BJ	FEBRUARY 2007	RJM
AUG. 29, 2000	BJ	FEB. 8, 2016	PJJ
JAN. 09, 2001	BJ		
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

G:\Current Drawings\MRP Maps\Lila Canyon\LBC Sect 26 Breakouts\Plate 5-3 Subsidence Control 01-2016.dwg, Plate 5-3, 2/5/2016 1:53:07 PM, 1:1

2000 0 4000 8000 FEET

RECEIVED
FEB 09 2016
DIV. OF OIL, GAS & MINING

BRONCO COAL CO.
#SL-046512

CEUF
120 ACRES

ROBERT K. PEPER
120 ACRES

CEUF
(SURFACE AND MINERAL)

CARBON COUNTY RAILROAD

UTAHAMERICAN ENERGY INC.
(SURFACE AND MINERAL)

FEDERAL LEASE
#SL-066145
1,404.20 ACRES

PERMIT AREA

FEDERAL LEASE
#U-014218
320 ACRES

46K Volts

FEDERAL LEASE
#SL-066490
2,440 ACRES

FEDERAL LEASE
#U-0126947
1,059.84 ACRES

PERMIT AREA

INCIDENTAL BOUNDARY CHANGE (40 ACRES)

FEDERAL LEASE
#SL-069291
280 ACRES

FEDERAL LEASE
#U-014217
40 ACRES

TO SALT LAKE CITY

COUNTY ROAD

SOUTHERN PACIFIC RAILROAD

TO GRAND JUNCTION

T 15 S
T 16 S
T 16 S
T 17 S
R 13 E
R 14 E
R 14 E
R 15 E

N

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 PEPER	
CEUF		UtahAmerican Energy	

UTAH REGISTERED
#6449561
David W. Hibbs
2/8/16
PROFESSIONAL ENGINEER

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

COAL OWNERSHIP

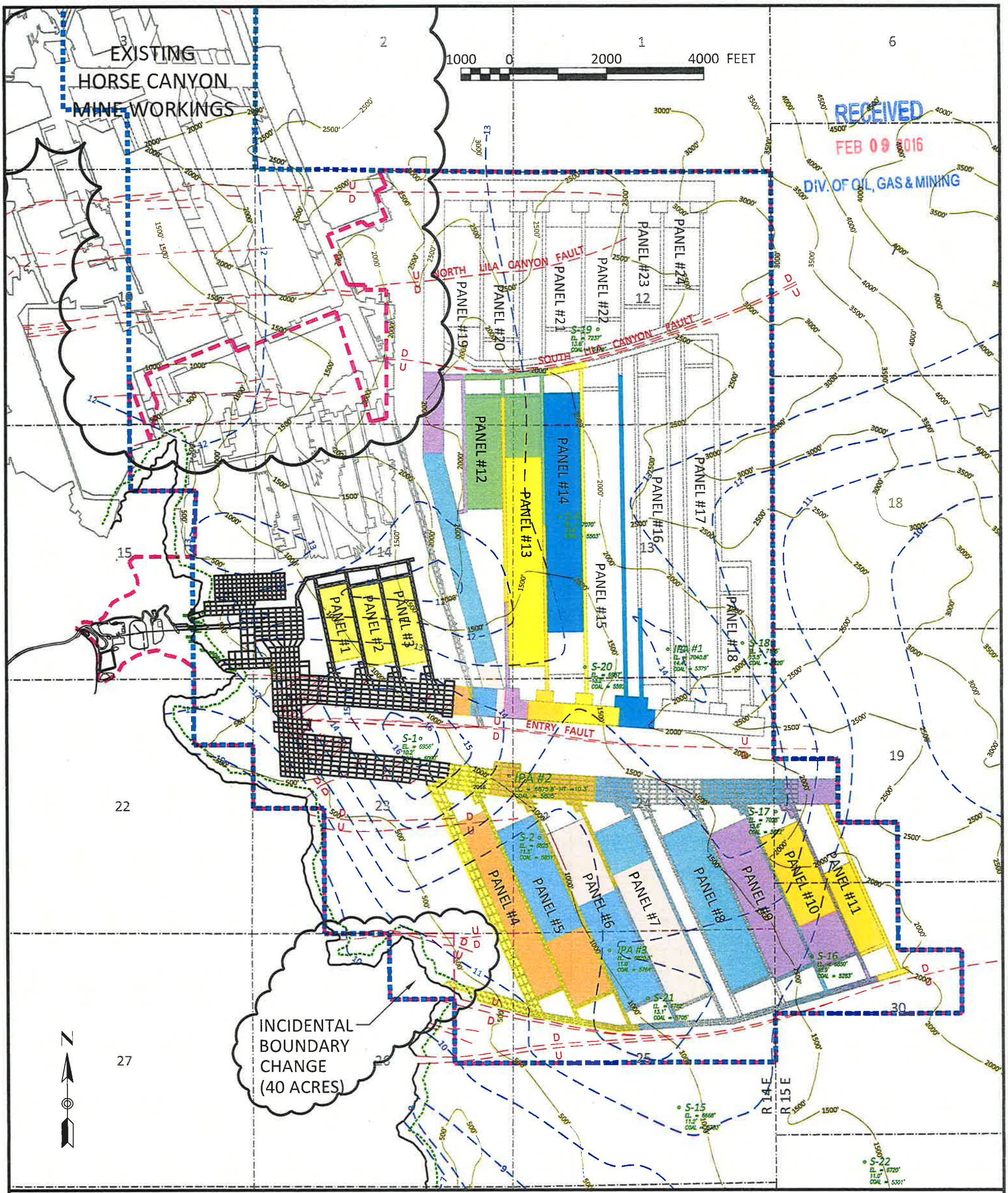
LILA CANYON MINE
23415 North Lila Canyon Road
Green River, Utah 84525

DOGM PERMIT# C0070013

DESIGN BY: EIS
SCALE: 1" = 4,000'
ORIGINAL DATE: MARCH 1998

PLATE 5-4

G:\Current Drawings\MRP Maps\Lila Canyon\LBC Sect 26 Breakouts\Plate 5-4 Coal Ownership 01-205.dwg, Layout1, 2/5/2016 1:54:50 PM, 1:1



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.
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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.

UTAH REGISTERED PROFESSIONAL ENGINEER
#6449561
David W. Hibbs
2/8/16

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		
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:	SCALE:
UEI	1" = 2,000'
	ORIGINAL DATE: JAN.. 1999

PLATE 5-5

G:\Current Drawings\MRP Maps\Lila Canyon\IBC Sect 26 Breakouts\Plate 5-5 Mine Map 01-2016.dwg, Plate 5-5, 2/5/2016 1:55:47 PM, 1:1

T 15 S
T 16 S
R 14 E
R 15 E

SUNNYSIDE FAULT
NORTH LILA CANYON FAULT
MIDDLE LILA CANYON FAULT
SOUTH LILA CANYON FAULT
ENTRY FAULT
CENTRAL GRABEN FAULT
WILLIAMS DRAW FAULT
SOUTH BOUNDARY FAULT

OC-01
OC-02
OC-03
OC-1a
OC-1b
OC-2
OC-3
OC-4
OC-5
OC-6
OC-7
OC-8
OC-9
OC-9a
OC-9b
OC-10
OC-11

INCIDENTAL BOUNDARY CHANGE (40 ACRES)

COUNTY ROAD

T 16 S
T 17 S

1500 0 3000 6000 FEET

LEGEND:

- Qa — YOUNGER SURFICIAL DEPOSITS: Stream alluvium
- Qg — YOUNGER SURFICIAL DEPOSITS: Gravel thin deposits
- Qc — OLDER SURFICIAL DEPOSITS: Colluvium & slopewash deposits
- Qf — OLDER SURFICIAL DEPOSITS: Alluvium fan deposits
- Qpa — PEDIMENT DEPOSITS: Unit A
- Qpb — PEDIMENT DEPOSITS: Unit B
- Qpc — PEDIMENT DEPOSITS: Unit C
- Tc — COLTON FORMATION: Undivided
- Tcu — COLTON FORMATION: Upper member
- Tcl — COLTON FORMATION: Lower member
- TKfn — FLAGSTAFF LIMESTONE AND NORTH HORN FORMATION:
- Kpb — PRICE RIVER FORMATION: Bluecastle sandstone member
- Kpm — PRICE RIVER FORMATION: Mudstone member
- Kc — CASTLEGATE SANDSTONE OF MESAVERDE GROUP:
- Kbs — Upper mudstone member of Sunnyside member
- Kbk — BLACKHAWK FORMATION OF MESAVERDE GROUP: Upper mudstone member of Kenilworth member
- Km — MANCOS SHALE: Main body

PERMIT AREA :
COAL OUTCROP :
FAULTS : D U
OUTCROP MEASUREMENTS : OC-11

DIP/STRIKE:
DIP = 10% - 14%
STRIKE

UTAH REGISTERED #6449561 David W. Hibbs 2/5/16 PROFESSIONAL ENGINEER

REVISIONS

DATE	BY	DATE	BY
		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

DOGM PERMIT# C0070013

DESIGN BY: EIS
SCALE: 1" = 3,000'
ORIGINAL DATE: MARCH 1998

PLATE 6-1

G:\Current Drawings\MRP Maps\Lila Canyon\IBC Sect 26 Breakouts\Plate 6-1 Geology Map 01-2016.dwg, Plate 6-1, 2/5/2016 1:57:16 PM, 1:1

2000 0 4000 8000 FEET

R 13 E
R 14 E
R 14 E
R 15 E
T 15 S
T 16 S
T 16 S
T 17 S

SUNNYSIDE FAULT

NORTH LILA CANYON FAULT
MIDDLE LILA CANYON FAULT
SOUTH LILA CANYON FAULT
U D 13°
D 8°
D 17°
D 8°

S-19
EL. = 7257'
13.6'
COAL = 5176'

TURTLE CANYON
WILDERNESS
STUDY AREA

S-3
EL. = 7070'
13.5'
COAL = 5505'

S-20
EL. = 6957'
13.2'
COAL = 5592'

IPA #1
EL. = 7040.5'
14.4'
COAL = 5579'

S-18
EL. = 7105'
13.5'
COAL = 5220'

S-1
EL. = 6956'
10.2'
COAL = 5008'

ENTRY FAULT
U D 50'

IPA #2
EL. = 6875.8' HT. = 10.3'
COAL = 5805'

S-2
EL. = 6825'
11.3'
COAL = 5851'

S-17
EL. = 7038'
13.5'
COAL = 5222'

IPA #3
EL. = 6820.2'
11.0'
COAL = 5764'

S-21
EL. = 6782'
13.1'
COAL = 5705'

CENTRAL DRAW FAULT
U D 150'

S-16
EL. = 6850'
10.9'
COAL = 5283'

INCIDENTAL BOUNDARY
CHANGE (40 ACRES)

POTENTIAL
AREA OF
FUTURE MINING

S-15
EL. = 6668'
11.2'
COAL = 5733'

S-22
EL. = 6720'
11.0'
COAL = 5301'

S-4
EL. = 6647'
9.6'
COAL = 5624'

S-23
EL. = 6710'
11.0'
COAL = 5125'

WILLIAM'S DRAW FAULT
D ±195'

S-13
EL. = 6715'
6.1'
COAL = 5194'

S-26
EL. = 6470.86'
6.1'
COAL = 6164'

S-11
EL. = 6558'
7.7'
COAL = 5689'

S-29
EL. = 6735.82'
7.9'
COAL = 5880'

POTENTIAL
AREA OF
FUTURE MINING

S-24
EL. = 6429.45'
6.6'
COAL = 6291'

S-25
EL. = 6497.42'
4.9'
COAL = 6334'

S-12
EL. = 6597'
8.2'
COAL = 5679'

S-14
EL. = 6630'
6.3'
COAL = 5233'

S-6
EL. = 6380'
5.0'
COAL = 6185'

S-31
EL. = 354.34'
7.2'
COAL = 5896'

S-27
EL. = 6309.52'
8.2'
COAL = 6060'

S-7
EL. = 6282'
6.8'
COAL = 6115'

S-8
EL. = 6480'
7.3'
COAL = 5603'

S-10
EL. = 6530'
4.3'
COAL = 5070'

S-28
EL. = 6203.46'
6.5'
COAL = 6084'

SOUTH BOUNDARY FAULT
U D 70'
U D 15'

S-5
EL. = 6152'
7.3'
COAL = 5939'

S-9
EL. = 6345'
3.9'
COAL = 5196'

OC-1 OC-2 OC-3 OC-4 OC-5 OC-6 OC-7 OC-8 OC-9 OC-9a OC-9b OC-10 OC-11 OC-12 OC-13

THE COVE
COUNTY ROAD
46K VOLTS
SOUTHERN PACIFIC RAILROAD
TO GRAND JUNCTION
TO SALT LAKE CITY
124
6
191

LEGEND:

PERMIT AREA :
COAL OUTCROP :
FAULTS :
OUTCROP MEASUREMENTS : OC-11
LMU AREA :
WILDERNESS STUDY AREA :
DRILL HOLES : S-28
EPHEMERAL STREAMS :

DIP/STRIKE:

STRIKE
DIP = 10% - 14%

UTAH REGISTERED
#6449561
David W. Hibbs
2/8/16
PROFESSIONAL ENGINEER

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

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

G:\Current Drawings\MRP Maps\Lila Canyon\LBC Sect 26 Breakouts\Plate 6-2 General Geology 01-2016.dwg, Plate 6-2, 2/5/2016 1:58:20 PM, 1:1

T 16 S
R 16 E
R 17 E
1500 0 3000 6000 FEET

NORTH LILA CANYON FAULT
MIDDLE LILA CANYON FAULT
SOUTH LILA CANYON FAULT
CENTRAL GRABEN FAULT
ENTRY FAULT
WILLIAM'S DRAW FAULT
SOUTH BOUNDARY FAULT
COUNTY ROAD

S-19 EL = 7237' 13.6' COAL = 5176'
S-3 EL = 7070' 13.5' COAL = 5503'
IPA #1 EL = 7040.8' 14.4' COAL = 5379'
S-20 EL = 6952' 13.2' COAL = 5592'
S-18 EL = 7105' 13.5' COAL = 5500'
S-1 EL = 6956' 10.2' COAL = 6000'
IPA #2 EL = 6875.8' HT = 10.0' COAL = 5805'
S-17 EL = 7038' 13.6' COAL = 5522'
S-2 EL = 6825' 11.5' COAL = 5851'
IPA #3 EL = 6820.3' 11.0' COAL = 5764'
S-21 EL = 6782' 13.1' COAL = 5705'
S-16 EL = 6850' 10.9' COAL = 5283'
S-15 EL = 6668' 11.2' COAL = 5733'
S-22 EL = 6720' 11.0' COAL = 5301'
S-23 EL = 6710' 11.0' COAL = 5126'
S-4 EL = 6647' 9.6' COAL = 5624'
S-13 EL = 6715' 8.1' COAL = 5194'
S-11 EL = 6558' 7.7' COAL = 5689'
S-26 EL = 6470.86' 6.1' COAL = 6104'
S-29 EL = 6735.82' 7.1' COAL = 5880'
S-24 EL = 6429.45' 6.6' COAL = 6291'
S-25 EL = 6497.42' 4.5' COAL = 6334'
S-12 EL = 6597' 8.2' COAL = 5679'
S-14 EL = 6630' 8.3' COAL = 5233'
S-6 EL = 6380' 5.0' COAL = 6185'
S-31 EL = 364.34' 7.2' COAL = 5896'
S-27 EL = 6309.52' 8.2' COAL = 6060'
S-7 EL = 6282' 6.8' COAL = 6116'
S-8 EL = 6480' 7.3' COAL = 5603'
S-10 EL = 6530' 4.3' COAL = 5070'
S-28 EL = 6206.46' 6.5' COAL = 6084'
S-9 EL = 6345' 3.9' COAL = 5196'
S-5 EL = 6152' 7.3' COAL = 5939'

OC-01a OC-02 OC-03 OC-1a OC-1b OC-2 OC-3 OC-4 OC-6 OC-7 OC-8 OC-9 OC-9a OC-9b OC-10 OC-11

INCIDENTAL BOUNDARY CHANGE (40 ACRES)

T 16 S
T 17 S

LEGEND:

- PERMIT AREA :
- COAL OUTCROP :
- FAULTS :
- OUTCROP MEASUREMENTS : OC-11
- LMU AREA :
- DRILL HOLES : S-28
- SEAM THICKNESS ISOPACHS : (IN FEET) 8
- COVER (500' INTERVALS) : 1000'
- EPHEMERAL STREAMS :

DIP/STRIKE:

STRIKE
DIP = 10% - 14%

UTAH REGISTERED
David W. Hibbs
#6449561
2/4/16
PROFESSIONAL ENGINEER

REVISIONS

DATE	BY
8/29/2000	BJ
12/14/2000	BJ
APR. 19, 2002	RJM
SEPT. 30, 2002	RJM
FEB. 8, 2016	PJJ

COAL THICKNESS ISOPACHS

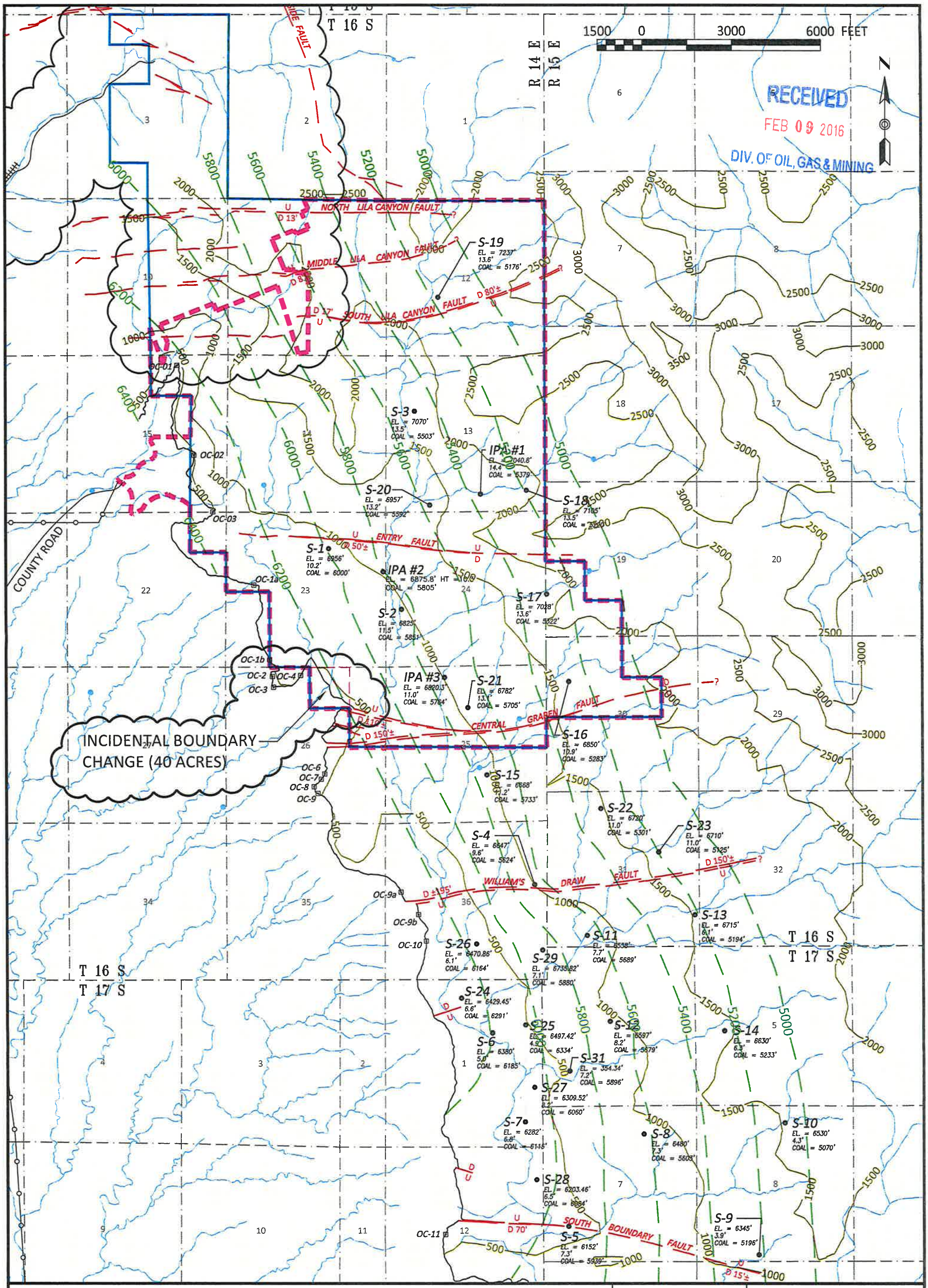
LILA CANYON MINE
23415 North Lila Canyon Road
Green River, Utah 84525

DOGM PERMIT# C0070013

DESIGN BY: BLACKHAWK ENG.
SCALE: 1" = 3,000'
ORIGINAL DATE: JAN. 1998

PLATE 6-3

G:\Current Drawings\MRP Maps\Lila Canyon\IBC Sect 26 Breakouts\Plate 6-3 Coal Isopachs 01-2016.dwg, Plate 6-3, 2/5/2016 1:59:33 PM, 1:1



LEGEND:

- PERMIT AREA :
- COAL OUTCROP :
- FAULTS : D / U
- OUTCROP MEASUREMENTS : OC-11
- LMU AREA :
- DRILL HOLES : S-28
- STRUCTURE LINES : 5200
- COVER (500' INTERVALS) : 1000'
- EPHEMERAL STREAMS :

DIP/STRIKE:

STRIKE

DIP = 10% - 14%

UTAH REGISTERED #6449561 David W. Hibbs 2/8/16 PROFESSIONAL ENGINEER

REVISIONS

DATE	BY
8/29/2000	BJ
12/14/2000	BJ
APR. 19, 2002	RJM
SEPT. 30, 2002	RJM
FEB. 8, 2016	PJJ

COVER AND STRUCTURE MAP

LILA CANYON MINE

23415 North Lila Canyon Road
Green River, Utah 84525

DOGM PERMIT# C0070013

DESIGN BY: BLACKHAWK ENG.

SCALE: 1" = 3,000'

ORIGINAL DATE: JAN. 1998

PLATE 6-4

G:\Current Drawings\WRP Maps\Lila Canyon\IBC Sect 26 Breakouts\Plate 6-4 Cover and Structure 1-2016.dwg, Plate 6-4, 2/5/2016 2:00:24 PM, 1:1

T 16 S

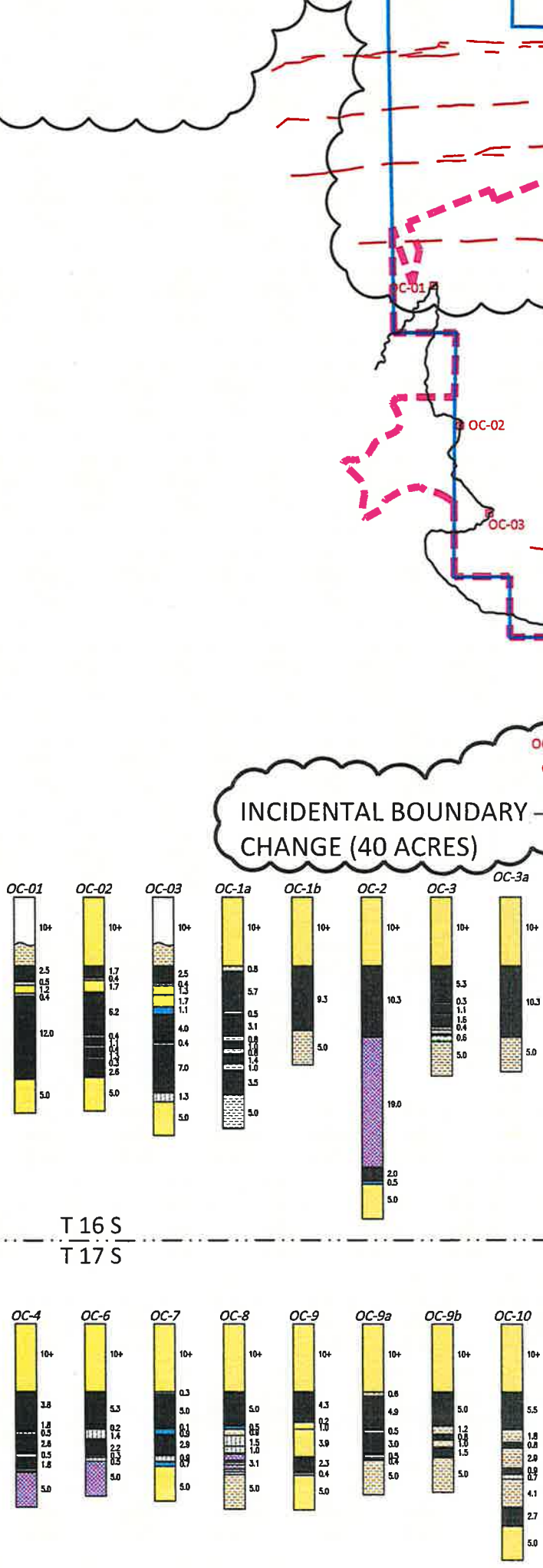
R 14 E
R 15 E

1600 0 3200 6400 FEET

RECEIVED
FEB 09 2016
DIV. OF OIL, GAS & MINING

INCIDENTAL BOUNDARY CHANGE (40 ACRES)

T 16 S
T 17 S



DIP/STRIKE:

N

LEGEND:

COAL:
BONE COAL:
CARBONACEOUS SHALE:
MUDSTONE:
SILTSTONE:
SANDSTONE:
LAMINATED SILTSTONE/SANDSTONE:

PERMIT AREA :
COAL OUTCROP :
FAULTS :
OUTCROP MEASUREMENTS : OC-11
LMU AREA :
DRILL HOLES / SEAM HEIGHT : S-28 6.5'

REVISIONS	
DATE	BY
8/29/2000	BJ
9/30/2002	RJM
02/08/2016	PJJ

COAL SECTIONS

LILA CANYON MINE
23415 North Lila Canyon Road
Green River, Utah 84525

DOGM PERMIT# C0070013

DESIGN BY: BLACKHAWK ENG.
SCALE: AS SHOWN
ORIGINAL DATE: FEB. 1998

PLATE 6-5

G:\Current Drawings\MRP Maps\Lila Canyon\LBC Sect 26 Breakouts\Plate 6-5 Coal Sections 01-2016.dwg, Plate 6-5, 2/5/2016 2:01:10 PM, 1:1

2000 0 4000 8000 FEET

R 13 E R 14 E R 14 E R 15 E T 15 S T 16 S T 16 S T 17 S

91-557 H-10 H-11 (HC-11) H-9 (HC-9) H-8 H-7 H-13 (HC-13) H-14 (HC-14) 91-557 HCSW-1 (HC-1) 91-1903

SUNNYSIDE FAULT

HCSW-2 001 91-148 H-2 (HC-2) RS-2 91-149 91-150 91-4959 RS-1 H-5 H-6 H-4 H-3 1-A 1-B H-1 002 91-2616 LAST OBSERVED WATER ELEVATION 5870 MAIN SLOPE ROTARY DUMP WATER LEVEL - 5800 3-D 3-A 3-B 3-C (L-20-G) 2 3 1

Middle Canyon Horse Canyon Horse Canyon Weir B-1 (HC-2) 124 001A 002A MDC Well 91-185 HCSW-3 91-183

H-21 H-21A H-20 H-20A H-2 H-19 91-618 91-617 NORTH LILA CANYON FAULT MIDDLE LILA CANYON FAULT SOUTH LILA CANYON FAULT D 80'± D 17' 91-2615 H-18B H-18A H-18 H-92 91-4650 91-4705 91-4621 9 (R) 8-A 19-B 19-A 91-399 (L-7-G) 91-2537 91-2521 91-4701

THE COVE Grassy Wash 46k VOLTS COUNTY ROAD Right Fork Lila Wash PROJECTED PIEZIOMETRIC SURFACE

L-1-S L-5-G (MINE WATER) L-4-S L-2-S L-3-S 91-4648 91-4649 D 50'± ENTRY FAULT IPA #1 EL = 7034 14.4' WATER LEVEL - 5904 IPA #2 EL = 6865 10.3' WATER LEVEL - 5962 91-2539 (L-9-G) 91-810 91-2517 L-13-S 91-2519 91-808 10-A 91-2538 (L-8-G) 91-4701 91-4703 18-A 15-B 15-C 16-B 16-A 16-C 17 18 17-A

INCIDENTAL BOUNDARY CHANGE (40 ACRES)

Alkali Pond 91-2618 L-17-S L-16-S L-18-S 110'± D 150'± L-19-S CENTRAL GRABEN FAULT 12-B 12-C 12-A 12-D 12-E 11 12 L-14-S

Little Park Wash IPA #3 EL = 6810 11.0' WATER LEVEL - 5975

91-2621 Marsing Bros. Reservoir Powerline Pond 91-2619 91-2620 91-2617 Harve Marsing Reservoir Stinky Spring Wash Grassy Wash 2008 Seep Inventory Area

WILLIAM'S DRAW FAULT D ±195' D 150'± 13-B 13 91-4381 91-2520 14-A 20 14 91-809 13-A 91-2535 Williams Right Fork Williams Draw L-15-S

91-4646 91-2646 Cove Reservoir #1 Big Pond 91-2665 TO SALT LAKE CITY SOUTHERN PACIFIC RAILROAD 6 191

Marsh Flat Wash Little Park Wash S-32 EL = 6567 6.6' WATER LEVEL - 5836

SOUTH BOUNDARY FAULT D 70' D 15'± 91-4516 91-2518

LEGEND:

- PERMIT AREA :
- EPHEMERAL CHANNEL :
- COAL OUTCROP :
- FAULTS : D U
- 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.

UTAH REGISTERED #6449561 David W. Hibbs 2/8/16 PROFESSIONAL ENGINEER

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		
SEPTEMBER 2002	RJM		
NOVEMBER 2006	TJS		

PERMIT AREA HYDROLOGY

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 7-1

G:\Current Drawings\MRP Maps\Lila Canyon\IBC Sect 26 Breakouts\Plate 7-1 Permit Area Hydrology 01-2016.dwg, Plate 7-1, 2/5/2016 2:02:33 PM, 1:1

RECHARGE AREA

LIMITS OF EARTHFAX S&S INVENTORY

SUBSIDENCE BOUNDARY

INCIDENTAL BOUNDARY CHANGE

PERMIT AREA

Horse Canyon Well

MDC Well ★ HCSW-3

003 (REMOVED)

002 (REMOVED)

HCSW-2

HCSW-1 (HC-1)

ROTARY DUMP

WATER LEVEL = 5800

L-1-S

L-2-S

L-3-S

L-4-S

L-5-C (MINE WATER)

L-10-C SPRING

L-12-C SPRING

L-13-S

L-14-S

L-15-S

L-16-C Little Slink

L-17-C Big Slink

L-18-S

COTTONWOOD SPRING

PINE SPRING

LEGEND

Qal	Alluvium
Qcl	Colluvium
Qf	Alluvial fan deposit
Qcf	Coalesced alluvial fan deposit
Qsw	Slope wash
QTpm	Pediment mantle
Qt	Terrace deposit
Tg	Green River Formation
Tc	Colton Formation
Tw	Wasatch Formation
Tfn	Flagstaff Member of Green River Formation and North Horn Formation
Kt	Tuscher Formation
Kfn	Farrer and Neslen Formations
Kmbb	Buck Tongue of Mancos Shale
Kpru	Upper Part of Price River Formation
Kbm	Bluecastle Sandstone Member
Kc	Castlegate Sandstone
Kbh	Blackhawk Formation and Star
Kmub	Upper part of Blue Gate Member
Kme	Emery Sandstone Member
Kmeu	Upper sandstone unit
Kmem	Middle shale unit
Kmel	Lower sandstone unit
Kmbg	Blue Gate Member
Kmbg	Garley Canyon Sandstone Member
Kmf	Ferron Sandstone Member
Kmt	Tununk Member
Kmu	Upper part of Mancos Shale, undivided
Kmf	Ferron Sandstone Member
Kmt	Tununk Member
Jm	Morrison Formation
Jmbb	Brushy Basin Member
Jms	Salt Wash Sandstone Member
Js	Summerville Formation
Jcu	Curtis Formation
Je	Entrada Sandstone
Jc	Carmel Formation
JTn	Navajo Sandstone
Trk	Kayenta Formation

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

UTAH REGISTERED PROFESSIONAL ENGINEER #6449561 David W. Hibbs 2/8/16

2000 0 4000 8000 FEET

N

REVISIONS	
DATE	BY
01/2006	
07/2006	
02/08/2016	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

G:\Current Drawings\MRP Maps\Lila Canyon\IBC Sect 26 Breakouts\Plate 7-1a Permit Hydrology 01-2016.dwg, Plate 7-1a, 2/5/2016 2:03:31 PM, 1:1

2000 0 4000 8000 FEET

RECEIVED
FEB 09 2016
DIV. OF OIL, GAS & MINING

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.

UTAH REGISTERED #6449561 David W. Hibbs 2/5/16 PROFESSIONAL ENGINEER

REVISIONS

DATE	BY	DATE	BY
NOVEMBER 1999	BHE	FEBRUARY 2016	PJJ
AUGUST 2000	BHE		
DECEMBER 2000	BJ		
SEPTEMBER 2002	RJM		
NOVEMBER 2003	RJM		
JANUARY 2005	RJM		
NOVEMBER 2006	TJS		
NOVEMBER 2006	RJM		

WATER RIGHTS

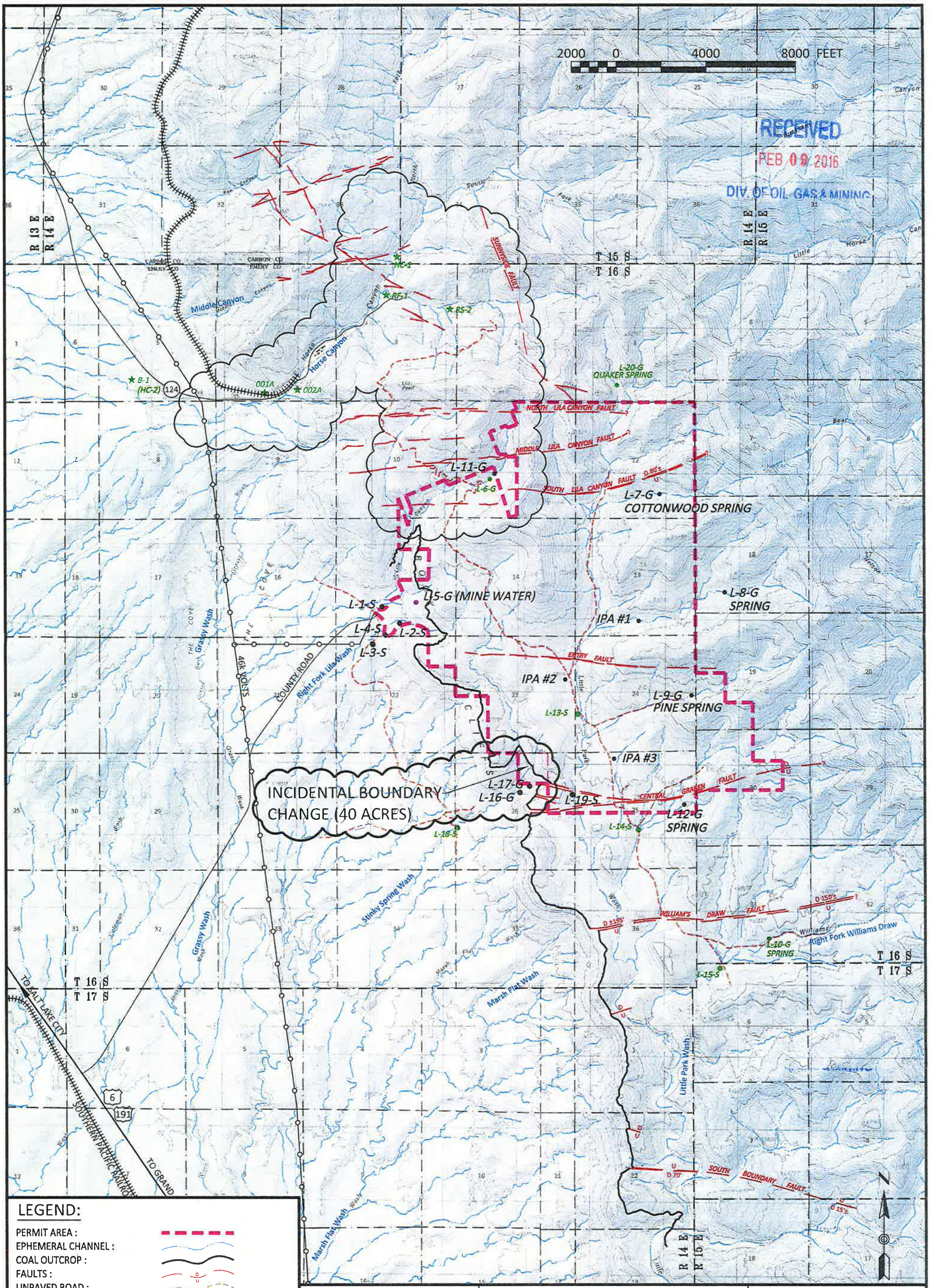
LILA CANYON MINE
23415 North Lila Canyon Road
Green River, Utah 84525

DOGM PERMIT# C0070013

DESIGN BY: BLACKHAWK ENG.
SCALE: 1" = 4,000'
ORIGINAL DATE: MAY 1998

PLATE 7-3

G:\Current Drawings\MRP Maps\Lila Canyon\LBC Sect 26 Breakouts\Plate 7-3 Water Rights 01-2016.dwg, Plate 7-3, 2/5/2016 2:05:52 PM, 1:1



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.

UTAH REGISTERED #6449561 David W. Hibbs 2/8/16 PROFESSIONAL ENGINEER

REVISIONS

DATE	BY	DATE	BY
JULY 1999	WJ	JUNE 2011	TJS
NOVEMBER 1999	BHE	FEB. 8, 2016	PJJ
MARCH 2000	BHE		
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

DOGM PERMIT# C0070013

DESIGN BY: BLACKHAWK ENG.
SCALE: 1" = 4,000'
ORIGINAL DATE: MAY 1998

PLATE 7-4

G:\Current Drawings\MRP Maps\Lila Canyon\IBC Sect 26 Breakouts\Plate 7-4 Water Mon Locations 01-2016.dwg, Plate 7-4, 2/5/2016 2:06:40 PM, 1:1