

C/007/013 Incoming

#5569



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

January 17, 2018

Attn: Daron Haddock
Permit Supervisor

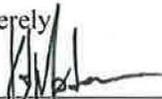
Re: Lila Canyon Mine, UtahAmerican Energy, Inc. C/007/013
L16-005 New Storage Pad Clean Copies

Dear Mr. Haddock,

Attached you will find Clean Copies for the New Storage Pad Revisions to the Lila Canyon MRP.

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

Sincerely,


Karin Madsen
Engineering Tech
UtahAmerican Energy, Inc.

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Application for Permit Processing Detailed Schedule of Changes to the MRP

L16-005 Lila Canyon New Storage Pad Task ID #5495

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	Plates: 5-2, 5-7d-1, 5-7d-2, 5-7d-3, 7-2, 7-4a, 7-5, 7-6a, 7-6b, 8-1, Surface Facilities Base Map
<input type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Chapter 1 Table of Contents, Pgs: 2, 8, 10-15
<input type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Chapter 2 Table of Contents, Pgs: 9-20 (text and page numbering)
<input type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Chapter 3 Table of Contents, Pgs: 5, 6, 8, 9, 13, 15, 22, 27,
<input type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Chapter 4 Pgs: 2, 3, 9, 10,
<input type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Chapter 5 Table of Contents, Pgs: 1-3, 6-53, 66-69, 70-72, 74-77, 79, 80, 82-85
<input type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Chapter 7 TOC and Pgs: 3, 21, 48, 49, 71, 73, 74, 75, 76, 77, 81, 88, 89, 90
<input type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Appendix 1-7
<input type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Appendix 7-4
<input type="checkbox"/> ADD	<input type="checkbox"/> REPLACE	<input type="checkbox"/> REMOVE	Bonding Calculation Sheets and Totals includes seamp quote
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Any other specific or special instructions required for insertion of this proposal into the Mining and Reclamation Plan?

Suzanne - Page 10 in Chapter 1 had missing information in the currently stamped

copy, so I've included pages 10-17 of ~~the~~ ~~current~~ Chapter 1 for incorporation.

Also - Chapter 5 pages 6-8 and due to format/page # changes.

- Kzi

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Chapter 1

TABLE OF CONTENTS

100.	GENERAL CONTENTS	Page -2-
110.	Minimum Requirements	Page -2-
111.	Intent	Page -2-
112.	Identification of Interests	Page -2-
113.	Violation Information	Page -8-
114.	Right-of-Entry Information	Page -9-
115.	Status of Unsuitability Claims	Page -12-
116.	Permit Term	Page -12-
117.	Insurance	Page -13-
118.	Filing Fee	Page -13-
120.	Permit Application Format and Contents	Page -13-
130.	Reporting of Technical Data	Page -14-
140.	Maps and Plans	Page -14-
150.	Completeness	Page -14-

List of Appendixes

Appendix 1-1	Ownership and Control
Appendix 1-2	Current and Previous Coal Mining Permits
Appendix 1-3	Violation Information
Appendix 1-4	County Correspondence
Appendix 1-5	Certifications, Publications, & Verifications
Appendix 1-6	BLM Correspondence
Appendix 1-7	BLM Rights-of-Way

List of Plates

Plate 1-1	Permit Area Map (Official Permit Boundary Map)
Plate 1-2	Disturbed Area Map

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

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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.

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 have 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.**, nor 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

114. Right-of-Entry Information.

A Right-of-Way application and the subsequent Environmental Assessment (EA) have 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 5,544.01 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 rights-of-way. See Appendix 1-7 for BLM letters assigning rights-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	T16S, R14E	11	E1/2	2445.00
	T16S, R14E	12	W1/2	
	T16S, R14E	13	W1/2	
	T16S, R14E	14	E1/2,SW1/4	
	T16S, R14E	15	E1/2SE1/4	
Lease Modification	T16S, R14E	15	SE1/4SE1/4NW1/4SE1/4 NE1/4NE1/4SW1/4SE1/4	
	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-014218	T16S, R14E	12	E1/2	320
#U-0126947	T16S, R14E	13	E1/2	1059.81
	T16S, R14E	24	E1/2	
	T16S, R14E	25	N1/2NE1/4,SE1/4NE1/4	
	T16S,R15E	19	SE1/4SW1/4, Lots 3 & 4	

	T16S,R15E	30	E1/2NW1/4,SW1/4NE1/4, Lots 1 & 2	
#U-014217	T16S,R14E	25	SW1/4NE1/4	40
#SL-069291	T16S,R14E	24	E1/2SW1/4	280
	T16S,R14E	25	NW1/4	
	T16S,R14E	26	SE1/4NE1/4	
#SL-066145	T16S,R14E	3	Lots 1-3, 7-11, Ne1/4SW1/4,SE1/4	1404.20
	T16S,R14E	10	E1/2	
	T16S,R14E	11	W1/2	
	T16S,R14E	14	NW1/4	
	T16S,R14E	15	N1/2NE1/4,SE1/4NE1/4	
Totals	Six Leases			5549.01

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 operations 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. 2027	

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

Approximately 5,992.07 surface acres, which include federal, state and private land, are included within the permit area. These surface acres are described in Table 4-2, and coal acres are shown on Table 4-2A.

The existing perimeter of the disturbed area contains approximately 40.26 surface acres within the disturbed area. However, only 37.02 acres will be disturbed; leaving 3.24 acres of undisturbed islands within the total 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 **INCORPORATED**

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.

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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 permit area and proposed disturbed area boundaries.

This permit extension is 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 historical purposes only.

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Appendix 1-7

Lila Canyon Extension

Appendix 1-7 BLM Rights-of-Way

(PDF files only. No other digital files exist.)

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FORM 2800-14
(August 1985)

Issuing Office
Moab District
Price Field Office

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
RIGHT-OF-WAY
SERIAL NUMBER UTU-77122

1. A right-of-way is hereby granted pursuant to Title V of the Federal Land Policy and Management Act of October 21, 1976 (90 Stat. 2776; 43 U.S.C. 1761).
2. Nature of Interest:
 - a. By this instrument, the holder:

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

receives a right to construct, operate, maintain and terminate a mine facility right-of-way on public lands described as follows:

Salt Lake Meridian, Utah,

T.16 S., R.14 E.,
Section 15, NW4SE4, S2SE4, E2SW4.
 - b. The right-of-way granted herein is for mine site facilities and encompasses 40.0 acres, more or less within the described subdivisions.
 - c. This instrument shall terminate thirty (30) years from its effective date unless, prior thereto, it is relinquished, abandoned, terminated, or modified pursuant to the terms and conditions of this instrument or of any applicable Federal law or regulation.
 - d. This instrument may be renewed. If renewed, the right-of-way or permit shall be subject to the regulations existing at the time of renewal and any other terms and conditions that the authorized officer deems necessary to protect the public interest.

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- e. Notwithstanding the expiration of this instrument or any renewal thereof, early relinquishment, abandonment, or termination, the provisions of this instrument, to the extent applicable, shall continue in effect and shall be binding on the holder, its successors, or assigns, until they have fully satisfied the obligations and/or liabilities accruing herein before or on account of the expiration or prior termination of the grant.

3. Rental:

For and in consideration of the rights granted, the holder agrees to pay the Bureau of Land Management fair market value rental as determined by the authorized officer, unless specifically exempted from such payment by regulation. Provided, however, the rental may be adjusted by the authorized officer, whenever necessary, to reflect changes in the fair market rental value as determined by the application of sound business management principles, and so far as practicable and feasible, in accordance with comparable commercial practices.

4. Terms and Conditions:

- a. This grant or permit is issued subject to the holder's compliance with all applicable regulations contained in Title 43 Code of Federal Regulations, part 2800.
- b. Upon grant termination by the authorized officer, all improvements shall be removed from the public lands within 90 days, or otherwise disposed of as provided in paragraph (4)(d), or as directed by the authorized officer.
- c. Each grant issued for a term of 20 years or more shall, at a minimum, be reviewed by the authorized officer at the end of the 20th year and at regular intervals thereafter not to exceed 10 years. Provided, however, a right-of-way or permit granted herein may be reviewed at any time deemed necessary by the authorized officer.
- d. The stipulations, plans, maps, or designs set forth in Exhibit A and Exhibit B, dated July 23, 2001, attached hereto are incorporated into and made a part of this grant instrument as fully and effectively as if they were set forth herein in their entirety. All commitments referenced in Chapter 2, Alternative B, all mitigation outlined in Chapter IV and all other applicable sections of the environmental assessment for the project entitled *Development of the Lila Canyon Project, Emery County, Utah* (EA NO. UT-070-99-22, July 2000) are incorporated into and made a part of this grant instrument as fully and effectively as if they were set forth herein in their entirety.
- e. Failure of the holder to comply with applicable law or any provision of this right-of-way grant or permit shall constitute grounds for suspension or termination thereof.

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- f. The holder shall perform all operations in a good and workmanlike manner so as to ensure protection of the environment and the health and safety of the public.
- g. Ninety (90) days prior to termination of the right-of-way, the holder shall contact the authorized officer to arrange a joint inspection of the right-of-way area. This inspection will be held to agree to an acceptable termination (and rehabilitation) plan. This plan shall include, but is not limited to, removal of facilities, drainage structures or surface material, recontouring, topsoiling, or seeding. The authorized officer must approve the plan in writing prior to the holder's commencement of any termination activities.

IN WITNESS WHEREOF, The undersigned agrees to the terms and conditions of this right-of-way grant or permit.

[Signature]
(Signature of Holder)

[Signature] (Acting)
(Signature of Authorized Officer)

[Signature]
(Title)

Field Manager
(Title)

7/25/01
(Date)

7/27/01
(Effective Date of Grant)

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JAN 23 2001

2890
UTU-77122
(UT-070)

Exhibit A

1. The holder shall operate, and maintain the facilities, improvements, and structures within this right-of-way in strict conformity with its mine permit plan (Utah Division of Oil Gas and Mining No. ACT/007/013). When approved this grant is made part of the permit. Any relocation, additional construction, or use that is not in accord with the approved mine plan shall not be initiated without the prior written approval of the authorized officer. A copy of the complete right-of-way grant, including all stipulations and mine plan, shall be made available on the right-of-way area during construction, operation, and termination to the authorized officer. Noncompliance with the above will be grounds for an immediate temporary suspension of activities if it constitutes a threat to public health and safety or the environment.
2. The holder shall contact the authorized officer at least fourteen (14) days prior to the anticipated start of construction and/or any surface disturbing activities. The authorized officer will require and schedule a preconstruction conference with the holder prior to the holder's commencing construction and/or surface disturbing activities on the right-of-way. The holder and/or his representative shall attend this conference. The holder's contractor, or agents involved with construction and/or any surface disturbing activities associated with the right-of-way, shall also attend this conference to review the stipulations of the grant including the plans(s) of development.
3. The holder shall not initiate any construction or other surface disturbing activities on the right-of-way without the prior written authorization of the authorized officer. Such authorization shall be a written notice to proceed issued by the authorized officer. Any notice to proceed shall authorize construction or use only as therein expressly stated and only for the particular location or use therein described. A notice to proceed shall not be issued until the mine plan is approved by the Office of Surface Mining Reclamation and Enforcement.
4. The authorized officer may suspend or terminate in whole, or in part, any notice to proceed which has been issued when, in his judgement, unforeseen conditions arise which result in the approved terms and conditions being inadequate to protect the public health and safety or to protect the environment.
5. The holder shall designate a representative who shall have the authority to act upon and to implement instructions from the authorized officer. The holder's representative shall be available for communication with the authorized officer within a reasonable time when construction or other surface-disturbing activities are underway.

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6. The holder shall conduct all activities associated with the construction, operation and maintenance of the right-of-way within the authorized limits of the right-of-way.
7. The holder shall survey and clearly mark the centerline and or exterior limits of the right-of-way, as determined by the authorized officer.
8. No construction or routine maintenance activities shall be performed during periods when the soil is too wet to adequately support construction equipment. If such equipment creates ruts in excess of six (6) inches deep, the soil shall be deemed to be too wet to adequately support construction equipment.
9. Construction sites shall be maintained in a sanitary condition at all times: waster material at the site shall be disposed of promptly at an appropriate waste disposal facility. "Waste" means all discarded matter including human waste, trash, garbage, refuse, oil drums, petroleum products, ashes, and equipment.
10. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the authorized officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the authorized officer. An evaluation of the discovery will be made by the authorized officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the authorized officer after consulting with the holder.
11. The Holder shall retain a contractor for third party compliance. The compliance contractor shall be separate, independent from, and not subcontracted by anyone preparing the engineering plans, design, construction or operation of the holder's project.

All costs incurred by the compliance contractor in connection with this project shall be the sole responsibility of the holder, and the holder agrees to hold harmless and indemnify BLM with respect to any and all claims, demands, cause(s) or action and the like which may arise from the performance of the compliance contractor or any services utilized in the compliance of the project.
12. Thirty (30) days prior to termination of the right-of-way, the holder shall contact the authorized officer to arrange a joint inspection of the right-of-way. This inspection will be held to agree to an acceptable termination and rehabilitation plan. This plan shall include, but is not limited to, removal of facilities, recontouring, topsoiling, or seeding. The authorized officer must approve the plan in writing prior to the holder's commencement of any termination activities.

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United States Department of the Interior

BUREAU OF LAND MANAGEMENT

Green River District
Price Field Office
125 South 600 West
Price, UT 84501

<http://www.blm.gov/ut/st/en/fo/price.html>



IN REPLY REFER TO:
UTU-91789
2800 (UTG020)

NOV 03 2016

CERTIFIED MAIL-RETURN RECEIPT REQUESTED:

No. 7016 1370 0000 0863 1803

PJ Jenson
UtahAmerican Energy Inc.
P.O. Box 910
East Carbon, Utah 84520

Re: New Right-of-Way UTU-91789

DECISION

Right-of-Way Grant UTU-91789 Issued

Enclosed is a copy of a right-of-way grant (serial number UTU-91789) which has been approved by the Bureau of Land Management and issued under authority of Title V of the Federal Land Policy and Management Act of October 21, 1976, as amended through September 1999, (90 Stat. 2776; 43 U.S.C. 1761). The issuance of this right-of-way grant constitutes a final decision by the Bureau of Land Management in this matter.

This decision may be appealed to the Interior Board of Land Appeals, Office of the Secretary, in accordance with the regulations contained in 43 CFR, Part 4, and the enclosed Form 1842-1. If an appeal is taken, your notice of appeal must be filed in this office (at the above address) within 30 days from receipt of this decision. The appellant has the burden of showing that the decision appealed from is in error.

If you wish to file a petition pursuant to regulation 43 CFR 4.21 (58 FR 4939, January 19, 1993) or 43 CFR 2801.10 for a stay of the effectiveness of this decision during the time that your appeal is being reviewed by the Board, the petition for a stay must accompany your notice of appeal. A petition for a stay is required to show sufficient justification based on the standards listed below. Copies of the notice of appeal and petition for a stay must also be submitted to each party named in this decision and to the Interior Board of Land Appeals and to the appropriate Office of the Solicitor (see 43 CFR 4.413) at the same time the original documents

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are filed with this office. If you request a stay, you have the burden of proof to demonstrate that a stay should be granted.

Standards for Obtaining a Stay

Except as otherwise provided by law or other pertinent regulation, a petition for a stay of a decision pending appeal shall show sufficient justification based on the following standards:

- (1) The relative harm to the parties if the stay is granted or denied;
- (2) The likelihood of the appellant's success on the merits;
- (3) The likelihood of immediate and irreparable harm if the stay is not granted; and
- (4) Whether the public interest favors granting the stay.

Please note that under the regulations in 43 CFR Group 2800, this decision is effective even if an appeal is filed. If you have any questions, please contact Jaydon Mead, Realty Specialist, at the above address, by e-mail jmead@blm.gov, or by phone (435) 636-3646.

Sincerely,



Don Stephens
Assistant Field Manager

Enclosure:
Right-of-Way Grant UTU-91789

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JAN 25 2018
Div. of Oil, Gas & Mining

FORM 2800-14
(August 1985)

Issuing Office
Price Field Office

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
RIGHT-OF-WAY GRANT

RECEIVED

OCT 25 2016

SERIAL NUMBER UTU-91789

BLM
Price, UT

1. A right-of-way is hereby granted pursuant to Title V of the Federal Land Policy and Management Act of October 21, 1976 (90 Stat. 2776; 43 U.S.C. 1761).

2. Nature of Interest:

a. By this instrument, the holder:

UtahAmerican Energy Inc.
P.O. Box 910
East Carbon, Utah 84520

Receives a right to construct, operate, maintain, and terminate an access road within portions of the public lands described as follows:

T.16 S., R. 14 E., Salt Lake Meridian, Emery County, Utah
Section 15: SE¼SW¼.

b. The right-of-way or permit area granted herein is 60 feet wide, 1,300 feet long plus an additional 150 feet by 200 feet area to improve an existing damn, and contains 2.5 acres, more or less.

c. This instrument shall expire on December 31, 2046. This grant is authorized for 30 years unless, prior thereto, it is relinquished, abandoned, terminated, or modified pursuant to the terms and conditions of this instrument or of any applicable Federal law or regulation.

d. This instrument may be renewed. If renewed, the right-of-way or permit shall be subject to the regulations existing at the time of renewal and any other terms and conditions that the Field Manager or other authorized officer deems necessary to protect the public interest.

e. Notwithstanding the expiration of this instrument or any renewal thereof, early relinquishment, abandonment, or termination, the provisions of this instrument, to the extent applicable, shall continue in effect and shall be binding on the holder, its successors, or assigns, until they have fully satisfied the obligations and/or liabilities accruing herein before or on account of the expiration, or prior termination, of the grant.

3. Rental:

For and in consideration of the rights granted, the holder agrees to pay the Bureau of Land Management fair market value rental as determined by the authorized officer unless specifically exempted from such payment by regulation. Provided, however, that the rental may be adjusted by the authorized officer, whenever necessary, to reflect changes in the fair market rental value as determined by the application of sound business management principles, and so far as practicable and feasible, in accordance with comparable commercial practices.

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Terms and Conditions:

4. Standard

a. This grant or permit is issued subject to the holder's compliance with all applicable regulations contained in

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Title 43 Code of Federal Regulations part 2800.

- b. Each grant issued for a term of 10 years or more shall, at a minimum, be reviewed by the authorized officer at the end of the 10th year and at regular intervals thereafter not to exceed 10 years. Provided, however, that a right-of-way or permit granted herein may be reviewed at any time deemed necessary by the authorized officer.
 - c. The maps set forth in exhibit A attached hereto, are incorporated into and made a part of this grant instrument as fully and effectively as if they were set forth herein in their entirety.
 - d. BLM may suspend or terminate your grant if you do not comply with applicable laws and regulations or any terms, conditions, or stipulations of the grant (such as rent payments), or if you abandon the right-of-way. Your failure to use your right-of-way for its authorized purpose for any continuous 5-year period creates a presumption of abandonment.
 - e. In the event that the public land underlying the right-of-way (ROW) encompassed in this grant, or a portion thereof, is conveyed out of Federal ownership and administration of the ROW or the land underlying the ROW is not being reserved to the United States in the patent/deed and/or the ROW is not within a ROW corridor being reserved to the United States in the patent/deed, the United States waives any right it has to administer the right-of-way, or portion thereof, within the conveyed land under Federal laws, statutes, and regulations, including the regulations at 43 CFR Part [2800][2880], including any rights to have the holder apply to BLM for amendments, modifications, or assignments and for BLM to approve or recognize such amendments, modifications, or assignments. At the time of conveyance, the patentee/grantee, and their successors and assigns, shall succeed to the interests of the United States in all matters relating to the right-of-way, or portion thereof, within the conveyed land and shall be subject to applicable State and local government laws, statutes, and ordinances. After conveyance, any disputes concerning compliance with the use and the terms and conditions of the ROW shall be considered a civil matter between the patentee/grantee and the ROW Holder.
5. Applicable Laws
- a. The holder shall comply with all Federal, State, and local regulations whether or not specifically mentioned within this grant.
 - b. Use of pesticides shall comply with the applicable Federal and state laws. Pesticides shall be used only in accordance with their registered uses and within limitations imposed by the Secretary of the Interior. Prior to the use of pesticides, the holder shall obtain from the Field Manager or other authorized officer written approval of a plan showing the type and quantity of material to be used, pest(s) to be controlled, method of application, location of storage and disposal of containers, and any other information deemed necessary by the authorized officer. Emergency use of pesticides shall be approved in writing by the authorized officer prior to such use.
 - c. The holder of this right-of-way grant or the holder's successor in interest shall comply with Title VI of the Civil Rights Act of 1964 (42 U.S.C. 2000d et seq.) and the regulations of the Secretary of the Interior issued pursuant thereto.
 - d. The holder shall meet Federal, State, and local emission standards for air quality.
 - e. The holder shall comply with all applicable Federal laws and regulations existing or hereafter enacted or promulgated. In any event, the holder(s) shall comply with the Toxic Substances Control Act of 1976, as amended (15 U.S.C. 2601, et seq.) with regard to any toxic substances that are used, generated by or stored on the right-of-way or on facilities authorized under this right-of-way grant. (See 40 CFR, Part 702-799 and especially, provisions on polychlorinated biphenyls, 40 CFR 761.1-761.193.) Additionally, any release of toxic substances (leaks, spills, etc.) in excess of the reportable quantity established by 40 CFR, Part 117 shall be reported as required by the Comprehensive Environmental Response, Compensation and Liability Act of 1980, Section 102b. A copy of any report required or requested by any Federal agency or State government as a result of a reportable release or spill of any toxic substances shall be furnished to the authorized officer concurrent with the filing of the reports to the involved Federal agency or State government.
 - f. The holder shall comply with the construction practices and mitigating measures established by 33 CFR 323.4, which sets forth the parameters of the "nationwide permit" required by Section 404 of the Clean Water Act. If the proposed action exceeds the parameters of the nationwide permit, the holder shall obtain an individual permit from the appropriate office of the Army Corps of Engineers and provide the authorized

officer with a copy of same. Failure to comply with this requirement shall be cause for suspension or termination of this right-of-way grant.

- g. The holder of Right-of-Way No. UTU- 91789 agrees to indemnify the United States against any liability arising from the release of any hazardous substance or hazardous waste (as these terms are defined in the Comprehensive Environmental Response, Compensation and Liability Act of 1980, 42 U.S.C. 9601, et seq., or the Resource Conservation and Recovery Act of 1976, 42 U.S.C. 6901 et seq.) on the right-of-way (unless the release or threatened release is wholly unrelated to the right-of-way holder's activity on the right-of-way. This agreement applies without regard to whether a release is caused by the holder, its agent, or unrelated third parties.
- h. The holder is prohibited from discharging oil or other pollutants into or upon the navigable waters of the United States, adjoining shorelines, or the waters of the contiguous zone in violation of Section 311 of the Clean Water Act as amended, 33 U.S.C. 1321, and the regulations issued there under, or applicable laws of the State and regulations issued there under. Holder shall give immediate notice of any such discharge to the authorized officer and such other Federal and State officials as are required by law to be given such notice.

6. Miscellaneous

- a. The holder shall perform all operations in a good and workmanlike manner so as to ensure protection of the environment and the health and safety of the public. All design, material, and construction, operation, maintenance, and termination practices shall be in accordance with safe and proven engineering practices.
- b. The holder shall designate a representative who shall have the authority to act upon and to implement instructions from the authorized officer. The holder's representative shall be available for communication with the authorized officer within a reasonable time when construction or other surface disturbing activities are underway.
- c. The holder shall permit free and unrestricted public access to and upon the right-of-way for all lawful purposes except for those specific areas designated as restricted by the Field Manager or other authorized officer to protect the public, wildlife, livestock or facilities constructed within the right-of-way.
- d. The holder shall inform the Field Manager at (435) 636-3600 within 48 hours of any accidents on federal lands.
- e. All surface disturbing activities will have a cultural survey completed (if one has not been previously completed) and submitted to the BLM before activities begin and may be monitored by a BLM permitted archaeologist if determined necessary by the BLM. If any cultural materials are discovered during construction, work in the area will halt immediately and the authorized official notified.
- f. Any cultural and/or paleontological resource (historic or prehistoric site or object) discovered by the holder, or any person working on his behalf, on public or Federal land shall be immediately reported to the authorized officer. Holder shall suspend all operations in the immediate area of such discovery until written authorization to proceed is issued by the authorized officer. An evaluation of the discovery will be made by the authorized officer to determine appropriate actions to prevent the loss of significant cultural or scientific values. The holder will be responsible for the cost of evaluation and any decision as to proper mitigation measures will be made by the authorized officer after consulting with the holder.
- g. The holder shall protect all survey monuments found within the right-of-way. Survey monuments include, but are not limited to, General Land Office and Bureau of Land Management Cadastral Survey Corners, reference corners, witness points, U.S. Coastal and Geodetic benchmarks and triangulation stations, military control monuments, and recognizable civil (both public and private) survey monuments. In the event of obliteration or disturbance of any of the above, the holder shall immediately report the incident, in writing, to the authorized officer and the respective installing authority if known. Where General Land Office or Bureau of Land Management right-of-way monuments or references are obliterated during operations, the holder shall secure the services of a registered land surveyor or a Bureau cadastral surveyor to restore the disturbed monuments and references using surveying procedures found in the Manual of Surveying Instructions for the Survey of the Public Lands in the United States, latest edition. The holder shall record such survey in the appropriate county and send a copy to the authorized officer. If the Bureau cadastral surveyors or other Federal surveyors are used to restore the disturbed survey monument, the holder shall be responsible for the survey cost.

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7. Construction / Maintenance

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- a. The holder shall conduct all activities associated with the construction, operation, and termination of the right-of-way within the authorized limits of the right-of-way.
- b. Equipment and vehicles shall be inspected and cleaned for vegetation matter and seeds prior to entering BLM administered lands. Clothing and animals should also be inspected for vegetation matter and seeds. Vehicles and equipment should be power washed at a commercial facility or other applicable site where invasive species/noxious weeds seeds can be flushed through a waste treatment plant, where seeds will become inert.
- c. The holder shall construct, operate, and maintain the facilities, improvements, and structures within this right-of-way in strict conformity with the plan of development which was approved and made part of this grant. Any relocation, additional construction, or use that is not in accord with the approved plan of development, shall not be initiated without the prior written approval of the authorized officer. A copy of the complete right-of-way grant, including all stipulations and approved plan of development, shall be made available on the right-of-way area during construction, operation, and termination to the authorized officer. Noncompliance with the above will be grounds for an immediate temporary suspension of activities if it constitutes a threat to public health and safety or the environment.
- d. The map and site plan drawings submitted with the original proposal shall be made a part of this right-of-way grant. All construction must conform to these drawings and maps.
- e. The holder shall provide for the safety of the public entering the right-of-way. This includes, but is not limited to barricades for open trenches, flagmen/women with communication systems for single-lane roads without intervisible turnouts, and attended gates for blasting operations.
- f. If any clearing is needed, the right-of-way will be brush-hogged to prevent unnecessary disturbance. Only those areas where safety, absolute need for construction or other regulations may warrant the use of topsoil removal by blading or scalping. This right-of-way clearing shall be limited to the limits of the right-of-way. Suitable topsoil material removed in conjunction with clearing and stripping shall be conserved in stockpiles within the right-of-way.
- g. Holder shall remove only the minimum amount of vegetation necessary for the construction of structures and facilities. Topsoil shall be conserved during excavation and reused as cover on disturbed areas to facilitate regrowth of vegetation.
- h. Prior to fill construction, the existing surface shall be sloped to avoid sharp banks and allow equipment operations. No fills shall be made with frozen or water saturated soils. Construction equipment shall be routed evenly over the entire width of the fill to obtain a thorough compaction.
- i. Construction holes left open overnight shall be covered. Covers shall be secured in place and shall be strong enough to prevent livestock or wildlife from falling through and into a hole.
- j. Holder shall limit excavation to the areas of construction. No borrow areas for fill material will be permitted on the site. All off-site borrow areas must be approved in writing by the authorized officer in advance of excavation. All waste material resulting from construction or use of the site by holder shall be removed from the site. All waste disposal sites on public land must be approved in writing by the authorized officer in advance of use.
- k. All roads and parking areas shall be constructed to provide drainage and minimize erosion. Culverts shall be installed if necessary to maintain drainage. All areas to be used for roads and parking can be surfaced with gravel.
- l. Construction sites shall be maintained in a sanitary condition at all times; waste materials at those sites shall be disposed of promptly at an appropriate waste disposal site. "Waste" means all discarded matter including, but not limited to, human waste, trash, garbage, refuse, oil drums, petroleum products, ashes, and equipment.
- m. If during any phase of the construction, operation, or termination any oil or other pollutant should be discharged from containers or vehicles and impact Federal lands, the control and total removal, disposal, and cleanup of such oil or other pollutant, wherever found, shall be the responsibility of the holder, regardless of fault. Upon failure of holder to control, cleanup, or dispose of such discharge on or affecting Federal lands, or to repair all damages to Federal lands resulting therefrom, the authorized officer may take such measures as he deems necessary to control and cleanup the discharge and restore the area, including, where appropriate, the aquatic environment and fish and wildlife habitats, at the full expense of the holder. Such action by the authorized officer shall not relieve the holder of any liability or responsibility.

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- n. Fences, gates, brace panels and any other range improvements shall be reconstructed to appropriate Bureau standards and/or specifications as determined by the authorized officer.
 - o. When construction activity in connection with the right-of-way breaks or destroys a natural barrier used for livestock control, the gap, thus opened, shall be fenced to prevent the drift of livestock. The subject natural barrier shall be identified by the authorized officer and fenced by the holder as per instruction of the authorized officer.
 - p. Construction-related traffic shall be restricted to routes approved by the authorized officer. New access roads or cross-country vehicle travel will not be permitted unless prior written approval is given by the authorized officer. Authorized roads used by the holder shall be rehabilitated or maintained when construction activities are complete as approved by the authorized officer.
 - q. Existing roads and trails on public lands that are blocked as the result of the construction project shall be rerouted or rebuilt as directed by the authorized officer.
 - r. No construction or routine maintenance activities shall be performed during periods when the soil is too wet to adequately support construction equipment. If such equipment creates ruts in excess of four inches deep, the soil shall be deemed too wet to adequately support construction equipment.
 - s. The holder shall construct waterbars on all disturbed areas as needed. Waterbars are to be constructed to: (1) simulate the imaginary contour lines of the slope (ideally with a grade of one or two percent); (2) drain away from the disturbed area; and (3) begin and end in vegetation or rock whenever possible.
 - t. A litter policing program shall be implemented by the holder, if requested and approved of in writing by the authorized officer, which covers all roads and sites associated with the right-of-way.
 - a. The holder is responsible for consultation with the authorized officer and/or local authorities for acceptable weed control methods (within limits imposed in the grant stipulations). The holder shall be responsible for annual surveys, reporting the results of the surveys to the BLM, and weed control on disturbed areas within the limits of the right-of-way.
 - b. Holder shall maintain the right-of-way in a safe, usable condition, as directed by the authorized officer.
8. Reclamation / Rehabilitation / Termination
- a. Upon grant termination by the Field Manager or other authorized officer, all improvements shall be removed from the public lands within 90 days, or otherwise disposed of as provided in paragraph (4)(d) or as directed by the authorized officer.
 - b. The holder shall restore drainages, to the greatest extent possible, to the original bank configuration, stream bottom width, and channel gradient. Loose soil, fill, and culverts shall be removed from drainage channels as directed by the authorized officer.
 - c. The holder shall re-contour the disturbed area and obliterate all earthwork by removing embankments, backfilling excavations, and grading to re-establish the approximate original contours of the land in the right-of-way.
 - d. The holder shall prepare a seedbed by scarifying the disturbed area, distributing topsoil uniformly, or disking the topsoil.
 - e. The holder shall seed all disturbed areas that have been or are being reclaimed with a seed mixture(s) submitted to and approved by the authorized officer.
 - f. Ninety (90) days prior to termination of the right-of-way, the holder shall contact the authorized officer to arrange a pre-termination conference. This conference will be held to review the termination provisions of the grant.

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IN WITNESS WHEREOF, The undersigned agrees to the terms and conditions of this right-of-way grant or permit.

Dail Helly
(Signature of Holder)
President
(Title)
10/11/16
(Date)

Don Stecher
(Signature of BLM Authorized Officer)
Assistant Field Manager, Price Field Office
(Title)
10-25-16
(Effective Date of Grant)

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Exhibit A (Map1)



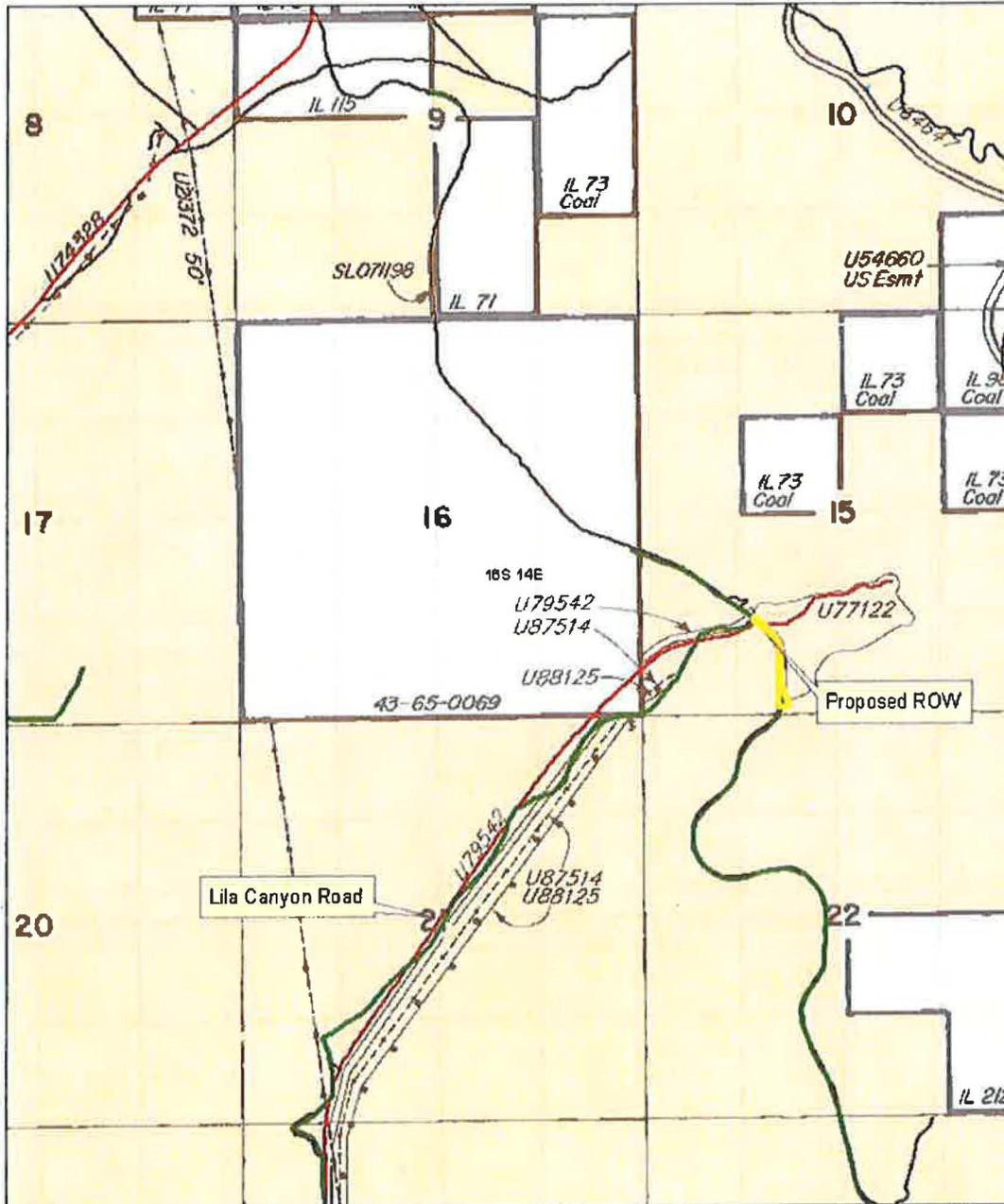
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Exhibit A (Map 2)

Proposed ROW

June 01, 2016

BLM



PRICE FIELD OFFICE



0 0.225 0.45 0.9 Miles

No warranty is made by the Bureau of Land Management as to the accuracy, reliability, or completeness of these data. The data are for informational purposes only. The data are not to be used for any other purpose. The data are not to be used for any other purpose. The data are not to be used for any other purpose.



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Designated Routes	
—	OHVs, Motorcycles
—	All Vehicles
—	Motorcycles
Emery County Roads	
—	<all other values>
CLASS	
—	B
—	Class 4 roads



JAN 25 2018

Div. of Oil, Gas & Mining

Chapter 2

TABLE OF CONTENTS

200	SOILS	Page -2-
	210 Introduction	Page -2-
	211 Premining Soil Resources	Page -2-
	212 Topsoil Handling	Page -2-
	220 Environmental Description	Page -2-
	221 Prime Farmland Investigation	Page -2-
	222 Soil Survey	Page -3-
	223 Soil Characterization	Page -6-
	224 Substitute Topsoil	Page -6-
	230 Operation Plan	Page -6-
	231 General Requirements	Page -6-
	232 Topsoil And Subsoil Removal	Page -9-
	233 Topsoil Substitutes and Supplements	Page -14-
	234 Topsoil Storage	Page -15-
	240 Reclamation Plan	Page -17-
	241 General Requirements	Page -17-
	242 Soil Redistribution	Page -18-
	243 Soil Nutrients and Amendments	Page -19-
	244 Soil Stabilization	Page -19-
	250 Performance Standards	Page -20-
	251 Topsoil, Subsoil Removal Maint. Redistribution	Page -20-
	252 Topsoil Stockpiles	Page -20-

List of Plates

Plate 2-1	Soils Map
Plate 2-2	Detailed Soils Map of Mine Facilities Site
Plate 2-3	Soil Salvage and Replacement Map
Plate 2-3a	Topsoil Salvage Map
Plate 2-4	Removed from Permit

List of Appendixes

Appendix 2-1	Prime Farm Land Determination
Appendix 2-2	Soil Descriptions NRCS
Appendix 2-3	Soil Survey (1998)
Appendix A1	Detailed Soil Survey Map
Appendix A2	Salvaged Soils Map

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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 areas of topsoil salvage and the respective amounts are found on Plate 2-3a. To date, topsoil salvaged is 65,745 cubic yards. Approximately 5,000 cubic yards of topsoil will be salvaged from currently undisturbed areas for the construction of the new Storage Pad.

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 new disturbance will bring a total of about 37.02 acres where soil would be salvaged and stored

in the topsoil stockpile for the surface facilities' reclamation.

Total volumes of soil stored in the topsoil pile would be approximately 70,745 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 new topsoil storage for the new Storage Pad is 5,000 new bank cubic yards x 1.18 which equals 5,900 loose cubic yards extra to be placed on the topsoil pile, totaling 71,645 cubic yards overall.

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 71,645 total 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 41 feet. The pile as designed has the capability of storing well over the required 71,645 cubic yards. See Figure 1 for topsoil pile calculations.

Soil from the proposed ventilation break out sites to the coal outcrop will not be salvaged. The slope above the north breakout fan is approximately 70%. Rock cover on the surface is an approximate 60% slope. As a result of the very limited ground disturbance, and lack of access, soil cannot be reasonably salvaged. At these small isolated sites, topsoil will

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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 reclamation 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.

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Lila Canyon Topsoil Calculations

Pile Height (in feet)	Pile Length (in feet)	Pile Width (in feet)	Area (in feet)	Volume LxW (in cubic yards)	Plus Slope Volume (in cubic yards)	One Foot Total Lift Volume (in cubic yards)	Total Cumulative Volume (in cubic yards)
0	350	250	87,500	0.00	0.00	0.00	0.00
1	346	246	85,116	3,152.44	44.15	3,196.59	3,196.59
2	342	242	82,764	3,065.33	43.56	3,108.89	6,305.48
3	338	238	80,444	2,979.41	42.96	3,022.37	9,327.85
4	334	234	78,156	2,894.67	42.37	2,937.04	12,264.89
5	330	230	75,900	2,811.11	41.78	2,852.89	15,117.78
6	326	226	73,676	2,728.74	41.19	2,769.93	17,887.70
7	322	222	71,484	2,647.56	40.59	2,688.15	20,575.85
8	318	218	69,324	2,567.56	40.00	2,607.56	23,183.41
9	314	214	67,196	2,488.74	39.41	2,528.15	25,711.56
10	310	210	65,100	2,411.11	38.81	2,449.93	28,161.48
11	306	206	63,036	2,334.67	38.22	2,372.89	30,534.37
12	302	202	61,004	2,259.41	37.63	2,297.04	32,831.41
13	298	198	59,004	2,185.33	37.04	2,222.37	35,053.78
14	294	194	57,036	2,112.44	36.44	2,148.89	37,202.67
15	290	190	55,100	2,040.74	35.85	2,076.59	39,279.26
16	286	186	53,196	1,970.22	35.26	2,005.48	41,284.74
17	282	182	51,324	1,900.89	34.67	1,935.56	43,220.30
18	278	178	49,484	1,832.74	34.07	1,866.81	45,087.11
19	274	174	47,676	1,765.78	33.48	1,799.26	46,886.37
20	270	170	45,900	1,700.00	32.89	1,732.89	48,619.26
21	266	166	44,156	1,635.41	32.30	1,667.70	50,286.96
22	262	162	42,444	1,572.00	31.70	1,603.70	51,890.67
23	258	158	40,764	1,509.78	31.11	1,540.89	53,431.56
24	254	154	39,116	1,448.74	30.52	1,479.26	54,910.81
25	250	150	37,500	1,388.89	29.93	1,418.81	56,329.63
26	246	146	35,916	1,330.22	29.33	1,359.56	57,689.19
27	242	142	34,364	1,272.74	28.74	1,301.48	58,990.67
28	238	138	32,844	1,216.44	28.15	1,244.59	60,235.26
29	234	134	31,356	1,161.33	27.56	1,188.89	61,424.15
30	230	130	29,900	1,107.41	26.96	1,134.37	62,558.52
31	226	126	28,476	1,054.67	26.37	1,081.04	63,639.56
32	222	122	27,084	1,003.11	25.78	1,028.89	64,668.44
33	218	118	25,724	952.74	25.19	977.93	65,646.37
34	214	114	24,396	903.56	24.59	928.15	66,574.52
35	210	110	23,100	855.56	24.00	879.56	67,454.07
36	206	106	21,836	808.74	23.41	832.15	68,286.22
37	202	102	20,604	763.11	22.81	785.93	69,072.15
38	198	98	19,404	718.67	22.22	740.89	69,813.04
39	194	94	18,236	675.41	21.63	697.04	70,510.07
40	190	90	17,100	633.33	21.04	654.37	71,164.44
41	186	86	15,996	592.44	20.44	612.89	71,777.33
42	182	82	14,924	552.74	19.85	575.59	72,349.93

Figure 1

INCORPORATED

JAN 25 2018

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 is incorporated into the Mining Reclamation Plan as Plate 2-3a.

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.

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JAN 25 2018

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.

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 and 5-2a 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.

INCORPORATED

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.

INCORPORATED

JAN 25 2018

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.

INCORPORATED

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.

Chapter 3

List of Tables

Table 3-1	Threatened and Endangered Species
Table 3-2	Ranking of Wildlife Habitat
Table 3-3	Reclamation Time Table
Table 3-4	Permanent Seed List
Table 3-5	Interim Seed Mixture

List of Plates

Plate 3-1A	Wildlife Habitat: Raptors (Confidential)
Plate 3-1B	Wildlife Habitat: Big Horn Sheep / Pronghorn Antelope
Plate 3-1C	Wildlife Habitat: Elk
Plate 3-1D	Wildlife Habitat: Deer
Plate 3-2	Vegetation

List of Appendixes

Appendix 3-1	Vegetation Inventory Lila Canyon
Appendix 3-2	Productivity Within and Around the Permit Area
Appendix 3-3	USFWS Correspondence
Appendix 3-4	Threatened and Endangered Species Inventories
Appendix 3-5	Raptor Surveys
Appendix 3-6	UDWR Wildlife Report
Appendix 3-7	ROW Mitigation Plan

INCORPORATED

JAN 25 2018

Div. of Oil, Gas & Mining

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 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 40.26 acre mine site is within the Upper Sonoran life zone. The dominant 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 Icelandic

INCORPORATED

JAN 25 2018

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.

TABLE 3-1

Page -6-

INCORPORATED

JAN 25 2018

Div. of Oil, Gas & Mining

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)

INCORPORATED

JAN 25 2018

Div. of Oil, Gas & Mining

The intermittent / ephemeral stream channels lack 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

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JAN 25 2018

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 40.26 total 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

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JAN 25 2018

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

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 5544.01 acres, of which only approximately 40.26 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

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Table 3-3
Time Table of Reclamation

April 16, 2028	Begin Demolition
November 15, 2028	Complete Demolition
April 16, 2029	Commence Earthwork
August 30, 2029	Completion of Phase 1 (Earthwork) Lower Area
September 1, 2029	Begin Earthwork Road / Portal Upper Area
October 1, 2029	Seeding and Mulching (Weather dependent) Completion of Earthwork Upper Area
November 1, 2029	Fencing
November 15, 2029	Reclamation Completed
July 2033	Ocular Estimates of Success (Remedial seeding if necessary September 2034)
October 2031	Planting Seedlings (If Needed)
July 2035	Quantitative Vegetation Inventory
August 2037	Quantitative Vegetation Inventory Site and Reference Area
August 2042	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.

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JAN 25 2018

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 ponds 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

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

342.100. The sediment ponds 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.

INCORPORATED

Chapter 4

CHAPTER 4

400 LAND USE AND AIR QUALITY

410. Premining and Postmining Land Use: Pre-mining land use of the Lila Canyon permit area includes grazing, wildlife habitat, coal mining, and limited recreation, such as hunting. Other than grazing no agricultural activities have been or are currently being performed in the permit area. Post-mining land use will not differ from land use as defined prior to the construction of the mine. Post-mining land use will include grazing, wildlife habitat, and recreational activities.

411. Environmental Description

411.100 Pre-mining land use of the Lila Canyon permit area includes grazing, wildlife habitat, coal mining, and limited recreation, such as hunting. Other than grazing no agricultural activities have been or are currently being performed in the permit area.

411.110 Pre-mining land use of the Lila Canyon permit area includes grazing, wildlife habitat, coal mining, and limited recreation, such as hunting. Other than grazing, limited agricultural activities have been or are currently being performed in the permit area. The mine permit area has not been conducive to agricultural practices due to lacking water sources, the steep, rugged terrain, and poor soil types.

To help minimize confusion a summary of Lila Canyon Permit Extension acreage is listed below:

Total federal coal held by the permittee:

5,544.01 acres. Shown on Table 1-1.

Total Permitted surface acres:

5,992.07 acres combination of federal, state and private lands. Shown in Table 4-2, 4-2A and described in Section 116.100.

Surface disturbance area:

40.26 acres discussed in Section 116.100, Section 542.200, Appendix 5-8. Includes areas of undisturbed within the disturbed area.

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Top Soil removal / Actual Disturbance:

37.02 Acres discussed in Section 232.100. This is the actual area anticipated to be disturbed for the life of the mine.

The permit area for the Lila Canyon mine is depicted on Plate 4-1. Included in this map are: the boundary of the permit area, the area which will include surface facilities, and the new portals. Existing roads, power lines, and railroads are identified. Private, federal, and state ownership are also identified on this plate. Wildlife habitats have been identified on Plate 3-1 and grazing allotment boundaries are depicted on Plate 4-2.

Table 4-1 lists the various owners of land within and around the permit area. The permit area is approximately 5992.07 acres. Within the permit area, 1446.64 acres comprise private land and 289.06 acres comprise state lands. The remaining 4,256.37 acres is federal land owned and managed by the United States Bureau of Land Management (BLM). Table 4-2 describes the surface ownership and Table 4-2A describes the coal ownership of the permit and surrounding area.

Lila Canyon lies within a region identified by the BLM as the Range Valley Mountain Habitat Management Plan Area (U-6-WHA-T4). This region was designated as such by a technical committee comprising state, federal, local government agencies and private citizens. This Habitat Management Plan area was established in September 1991 to provide management for the wildlife species of the area, including federally protected wildlife and plant species, big game, upland and small game waterfowl, unique and limited high value wildlife habitat, and access management. Big game and raptor habitat within the Lila Canyon Mine permit area, along with the Range Valley Mountain HMA, have been identified on Plate 3-1.

INCORPORATED

JAN 25 2018

Div. of Oil, Gas & Mining

411.120 Land use Description

The Lila Canyon Mine permit area has not and does not support a diversity of land uses due to soil types, topography, and hydrology of the area. The land surface of the permit area consists of rugged, southwest facing cliffs of the Book Cliffs. Many of which are deeply dissected by steep ephemeral drainages. The elevation in the mine permit area ranges from approximately 5,600 feet to 5,800 feet near and around the surface facilities site, to approximately 6,500 feet at the proposed portals location. The elevations along the ridge top predominantly range between 8,800 feet and 9,300 feet. The elevation at the top of Lila Canyon, near the mouth of the creek, is 8,530 feet. Large boulders and sandstone slabs clutter the sides and bottoms of cliff areas, as a result of cliff weathering. The base of the Book Cliffs consists of Mancos Shale Lowlands, of numerous southwesterly oriented ridges and drainages.

Three noteworthy drainages lie within and around the permit area. Grassy Wash originates in the area between Horse Canyon and Lila Canyon and flows southwest and south toward the Price River. The transportation and utility corridor will depart from Highway 191, Route 6 at the northeast corner of Section 1, Township 17S Range 13E and progress in the northeast direction to the mine permit area. The new road will cross the Grassy Wash drainage near the southwest corner of section 29, Township 16S Range 14E. The Marsh Flat drainage originates within close proximity of the mine permit area at Township 16S Range 14E Section 35. This drainage flows in the southwest direction toward the Price River. The Little Park Wash bisects the permit area in the north-south direction. This drainage enters the north boundary of the permit area at an approximate elevation of 7,600 feet and leaves the southern bound of the permit area at an approximate elevation of 6,200 feet. This drainage essentially parallels the western edge of the Book Cliffs and flows throughout the permit area at elevations of above 6,400 feet. Little Park Wash eventually drains into the Price River about eight miles down gradient of the southern bound of the mine permit area.

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Water uses within the mine permit area are limited to stock watering, mining, and domestic uses at mine sites. Sources for water within and around the Mine Permit area include various springs, ephemeral washes, Little Park Wash, Horse Canyon Creek, and one underground water well historically used for sprinkling purposes for operation and maintenance of the mine. A water rights search was conducted for the mine permit area and is included within Table 7-2.

Due to topography, limited available water resources, soil types, limited access, and remote location, it is evident that the land within the mine permit area historically has not been capable of supporting a diversity of uses. The greatest variety of compatible uses for this land is a combination of recreation, wildlife habitat, grazing, and coal mining.

411.130 According to Bryant Anderson, administrator of Emery County Planning and Zoning (Anderson, 1998), all land within the Mine Reclamation Permit area is zoned M&G-1 for mining and grazing. Grazing is the most pervasive existing use of the land in the Lila Canyon area.

The BLM is the land manager for most of the area within the permit. The permit area consists of 5,992.07 acres of which the BLM manages 4256.37 of the acres. Within the permit area, there are 1446.64 privately owned acres, and 289.06 State owned acres. Refer to Plate 4-1 for ownership boundaries.

The Turtle Canyon Wilderness Study Area (WSA) overlaps a small portion of the permit area. No surface facilities or associated impacts will occur within the WSA.

411.140. Cultural and historical resources investigations have been performed in the vicinity of the permit area in the past. Significant studies include "An Archaeological/Historical Inventory of Kaiser Steel corporation Horse Canyon Mine Lease, East Carbon

INCORPORATED

JAN 25 2018

Chapter 5

Table of Contents

500.	ENGINEERING	Page -1-
510.	Introduction	Page -1-
511.	General Requirements.	Page -1-
512.	Certification	Page -3-
513.	Compliance With MSHA Regulations and MSHA Approvals.	Page -4-
514.	Inspections.	Page -4-
515.	Reporting and Emergency Procedures.	Page -6-
516.	Prevention of Slides:	Page -8-
520.	Operation Plan.	Page -8-
	Current Temporary / Long-term Mine Facilities List	Page -8-
521.	General:	Page -19-
522.	Coal Recovery.	Page -25-
523.	Mining Methods:	Page -26-
524.	Blasting and Explosives:	Page -28-
525.	Subsidence:	Page -34-
526.	Mine Facilities.	Page -46-
527.	Transportation Facilities.	Page -50-
528.	Handling and Disposal	Page -51-
529.	Management of Mine Openings:	Page -54-
530.	Operational Design Criteria and Plans.	Page -55-
531.	General.	Page -55-
532.	Sediment Control:	Page -55-
533.	Impoundments.	Page -55-
534.	Roads.	Page -57-
535.	Spoil:	Page -58-
536.	Coal Mine Waste.	Page -58-
537.	Regraded Slopes.	Page -60-
540.	Reclamation Plan.	Page -60-
541.	General.	Page -60-
542.	Narratives, Maps and Plans.	Page -61-
550.	Reclamation Design Criteria and Plans.	Page -63-
551.	Casing and Sealing of Underground Openings.	Page -63-
552.	Permanent Features.	Page -63-
560.	Performance Standards.	Page -66-

INCORPORATED

JAN 25 2018

Div. of Oil, Gas & Mining

List of Appendixes

Appendix 5-1	Inspection Form for Excess Spoil
Appendix 5-2	Inspection Form for Impoundments
Appendix 5-3	Coal Mine Waste Fire Extinguishing Plan
Appendix 5-4	New Facility Designs
Appendix 5-5	Slope Stability Analysis
Appendix 5-6	Mine Openings (Closures)
Appendix 5-7	Rock Slope Material (Refuse Pile)
Appendix 5-8	Reclamation Plan

List of Plates

Plate 5-1	Previously Mined Areas
Plate 5-1A	Premining Contours
Plate 5-2	Surface Area Lila Canyon Mine (Official Disturbed Area Boundary Map)
5-2A	IBC Area - Graben Breakout
5-2B	Fan Pad As-Built
Plate 5-3	Subsidence Control Map
Plate 5-3	CONFIDENTIAL Subsidence Control Map with Raptor Information
Plate 5-4	Coal Ownership
Plate 5-5	Mine Map
Plate 5-6	Post Mining Topography
Plate 5-7A-1	Mine Site Cross Sections
Plate 5-7A-2	Mine Site Cross Sections
Plate 5-7A-3	Mine Site Cross Sections
Plate 5-7A-4	Mine Site Cross Sections
Plate 5-7B-1	Mine Site Cross Sections
Plate 5-7B-2	Mine Site Cross Sections
Plate 5-7B-3	Mine Site Cross Sections
Plate 5-7C	Reclaimed Profile
Plate 5-7D-1	New Storage Pad and Roads - Plans and Profiles
Plate 5-7D-2	New Storage Pad and Roads - Road Sections
Plate 5-7D-3	New Storage Pad and Roads - Road Sections
Plate 5-8	Coal Handling Facilities
Plate 5-9	Portal Plan and Sections

INCORPORATED

JAN 25 2018

Div. of Oil, Gas & Mining

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 (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 plans 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 are 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.

INCORPORATED

JAN 25 2018

Div. of Oil, Gas & Mining

- 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 (temporary and long-term) 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** Appropriate 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 certified, 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 are 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 Plates 7-6a and 7-6b)
- 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 nor 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

INCORPORATED

JAN 25 2018

- 514.311** During construction, inspections will be made on a regular basis, and upon completion of the ponds. 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.

INCORPORATED

JAN 25 2018

- 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.

INCORPORATED

JAN 25 2018

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 is 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 are the most logical and only feasible access to the permittee's coal leases.

Lila Canyon Current Temporary / Long-term Mine Facilities List

Current temporary and long-term structures and facilities are shown on Plate 5-2. The Keyed Mine Facilities from Plate 5-2 are numbered as follows:

Buildings

- 1) Temporary Bath House
- 2) Temporary Office Trailer
- 3) Temporary Office / Shop Building
- 4) Temporary Storage Shed (Wooden)
- 5) Temporary Storage Building (Metal)
- 7) Temporary Office Building
- 9) Temporary Storage Tent with concrete floor
- 22) Temporary Crusher/Screen Building

Utilities

- | <i>No Number</i> | <i>Mine Substation</i> |
|------------------|-----------------------------------|
| 8) | Potable Water Tank |
| 10) | Power Poles |
| 11) | Electrical Transformer |
| 12) | Overhead Power Transmission Lines |
| 13) | Buried Power Transmission Lines |

INCORPORATED

JAN 25 2018

Div. of Oil, Gas & Mining

- 28) Electrical Grounding Field
- 37) Non-Potable Water Storage Tanks
- 40) Concrete Electrical Junction Box
- 41) Temporary Concrete Septic Tank

Mine Facilities

- 14) Rock Dust Silo
- 16) Temporary Underground Reclaim Room
- 17) Temporary Concrete Retaining Wall
- 18) Temporary Loadout Conveyor (48")
- 19) Temporary Loadout MCC Building
- 20) Temporary Loadout Structure
- 21) Temporary Crusher Conveyor (48")
- 23) Temporary Crushed Coal Conveyor (48")
- 24) Temporary Crusher MCC Building
- 27) Concrete Equipment Pad
- 30) Existing ROM Coal Conveyor from Underground (60")
- 31) Steel Portal Canopy Structure
- 32) Concrete Conveyor Bay at Belt Portal
- 34) Mine MCC Building / Electrical Tower
- 35) Backup Ventilation Fans
- 36) Main Mine Ventilation Fan / Electrical Tower
- 39) Chain Link Fencing
- 43) Temporary Conveyor Counterweight Structure
- 44) Jersey Barrier Guard Rails
- 45) Concrete Trash Chute

Support Facilities

- No Number *Mine Facilities Access Road / Truck Loadout Road*
- No Number *Rock Slopes*
- No Number *Sediment Ponds*
- No Number *Slope Access Road / Portal Access Road*
- No Number *New Storage Pad*
- No Number *New Storage Pad Access Road*
- No Number *New Storage Pad Service Road*
- No Number *Topsoil Pile*
- 6) Temporary Concrete Walkway
- 15) Temporary Fuel Storage Tanks
- 25) Diversion Weir with Slide Gates
- 29) Sediment Pond Spillway Structure
- 42) Temporary Loadout Light Board

INCORPORATED

JAN 25 2018

Div. of Oil, Gas & Mining

38) Powder and Cap Magazines

Note: Long-Term Underground Pipes are not shown.

Note: Culvert locations are shown on Plate 7-5.

A description of current temporary and long-term structures and facilities:

BUILDINGS

1) Temporary Bath House

The temporary bath house is shown on Plate 5-2. This complex is made up of five (5) interconnected portable structures (trailers and metal intermodal structures). Shower and toilet facilities for all male employees are at this location. Female employees utilize a separate, nearby temporary trailer for showers and toilet facilities (see #2 below). The bath house provides a location for underground miners to change from clean street clothes to clothing suitable for underground use. The area provides showers for employees for use after their scheduled work shifts so they can clean up prior to returning home. The trailers and metal intermodal structures rest upon stacked concrete blocks for stability and leveling purposes. Once the long-term bath house (per Plate 8-1) is constructed, the temporary bath house and all supporting structures will be removed.

2) Temporary Office Trailer

The temporary office trailer is a prefabricated, self-contained, modular trailer, similar to those often seen on construction sites. The trailer can be moved using a vehicle with a tow hitch. Each trailer typically contains two (2) or three (3) offices and one (1) restroom. Each trailer is equipped with a waste water storage tank for the rest room. The waste water storage tank is emptied on a regular basis. One (1) temporary office trailer has been modified to provide shower and toilet facilities for female employees similarly to the temporary bath house (see #1 above). The office trailers are used by mine personnel in support positions to mine operations. Multiple trailers are currently used. The locations of these trailers are shown on Plate 5-2. Once long-term office areas are constructed, the temporary office trailers and all supporting structures will be removed.

3) Temporary Office / Shop Building

The Temporary Office / Shop Building is shown on Plate 5-2. The building is a prefabricated metal building on a concrete foundation system, with a 4" thick concrete floor slab. The building is split down the middle width-wise

INCORPORATED

with one side being the shop area, and the other office space for mine personnel in support positions to mine operations. The shop area is used to perform minor equipment repairs. The building measures approximately 30' by 62'. Once long-term offices and the long-term Shop/Warehouse have been constructed, the temporary office / shop building will be razed.

4) Temporary Storage Shed (Wooden)

The temporary wooden storage shed measures approximately 10' by 20' by 8' high, with a wooden floor structure. The shed is used to store various equipment and supplies needed for mine operations. Multiple sheds are currently used. The locations of these sheds are shown on Plate 5-2. Once the long-term Shop/Warehouse has been constructed, the temporary storage sheds will be removed.

5) Temporary Storage Building (Metal)

The temporary metal storage building is a prefabricated, metal, intermodal container used for storage. These structures are sometimes referred to as "conex containers." The containers are typically 20' to 40' long by 8' wide by 8.5' high. These structures are used to store various equipment and supplies needed for mine operations. The metal storage structures typically provide a higher level of security than do wooden sheds. Multiple metal storage buildings are currently used. The locations of these buildings are shown on Plate 5-2. Once the long-term Shop/Warehouse has been constructed, the temporary storage buildings will be removed.

7) Temporary Office Building

The temporary office / storage building is shown on Plate 5-2. The office space is used by mine personnel in support positions to mine operations. The building measures 20' by 12' by 10' high. The building is a wood frame on a concrete foundation. The floor is a 4" thick concrete slab. Once the long-term office areas and Shop/Warehouse have been constructed, the temporary office building will be razed.

9) Temporary Storage Tent with Concrete Floor

The temporary storage tent is constructed of an arched metal wall/roof structure covered with a canvas overlay. The tent rests on a 6" concrete floor slab. Two tents are currently in use at the mine site. One tent measures 30' by 30'. The other measures 70' by 48'. The tents are used to store large wares and supplies needed for mining operations that need some protection from the weather. The temporary storage tents with concrete floors are shown on Plate 5-2. Once the long-term Shop/Warehouse has

been constructed, the temporary storage tents and associated concrete floor

JAN 25 2010

slabs will be removed.

22) Temporary Crusher / Screen Building

The temporary crusher / screen building is shown on Plate 5-2, and houses the screen and crusher assemblies. The screen assembly sorts the coal as it enters the building, via the temporary crusher conveyor (see #21 below), between the larger lump sizes that need to be crushed (2"-8" in size) and the smaller nuggets that do not need to be crushed (less than 2" in size). The crusher assembly reduces the larger 2" to 8" sized coal lumps to nuggets measuring less than 2" in size. The coal that is now 2" or less in size falls onto the crushed coal conveyor (see #23 below) and exits the building. The building itself is constructed of a wide flange steel frame and rests on a 12" thick monolithic concrete slab base. The building measures approximately 48' by 22', and stands approximately 58' at its peak. The temporary crusher / screen building has been constructed to meet MSHA regulations. Once the long-term coal handling facilities have been constructed, the temporary crusher / screen building will be razed.

UTILITIES

Mine Substation

The mine substation is shown on Plate 5-2, and provides power to surface and underground areas of the mine property. The substation includes approximately four transformers setting on a concrete pad approximately 20' by 20' by 12" and fully fenced. The total fenced area of the substation is approximately 215' by 112'. Power is fed into the transformers at 138 KVA and will be transformed down to usable voltages for both the surface and underground facilities. It is anticipated that voltages of 110V, 220V, 440V will be used on the surface, and 12,470 volts will be utilized underground. The mine substation is constructed to fulfill all appropriate MSHA regulations. The Mine Substation will remain throughout the life of the mine, and will be removed during final reclamation.

8) Potable Water Tank

The potable water tank is shown on Plate 5-2. Potable water is purchased off-site and is transported to the mine site via tanker truck, which in turn fills the tank. The potable water is stored in this 15' diameter by 20' high metal tank. Water from this tank is used for toilets and showering in the temporary bath house (see #1 above). The tank is 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. The potable water tank will remain throughout the life of the mine, and will be removed during final reclamation.

10) Power Poles

Multiple wooden power poles are utilized throughout the disturbed area. Locations of power poles are shown on Plate 5-2. The power poles are large, upright wooden poles used to support overhead power transmission lines and other wires as needed. The power poles will remain throughout the life of the mine and will be removed during final reclamation.

11) Electrical Transformer

An electrical transformer is used to adjust and transfer electrical energy in electric power applications. Each transformer rests on a 4" thick concrete slab of suitable size to support the weight of the transformer. The transformer feeds various mine facilities. Multiple transformers are currently utilized. Their locations are shown on Plate 5-2. Transformers will be removed as their respective temporary facilities are removed and replaced upon the completion of long-term facilities (see Plate 8-1).

12) Overhead Power Transmission Lines

Within the disturbed area, both overhead and underground power lines will be utilized. Overhead power lines will be run where underground power lines are not feasible. Vertical power poles (see #10 above) support the overhead lines to provide adequate and safe clearances below the power transmission lines. The overhead power transmission lines have been spaced to protect raptors. As-built drawings will be provided upon completion of the long-term surface facilities. Overhead power lines will remain through the life of the mine, and will be removed upon final reclamation.

13) Buried Power Transmission Lines

Within the disturbed area both overhead and buried power lines will be utilized. Buried power transmission lines will be run where feasible. All buried power transmission lines will be run in conduits. As-built drawings will be provided upon completion of the long-term surface facilities. Long-term underground power lines will remain throughout the life of the mine. Upon final reclamation, the long-term underground power transmission lines will be abandoned and left in place.

28) Electrical Grounding Field

The electrical grounding field is composed of a grounding grid and rods buried below the soil. The electrical grounding field has been designed and constructed to meet MSHA requirements and regulations. It is used to ground the Mine Substation (see above). The location of the electrical grounding field is shown on Plate 5-2. The electrical grounding field will remain throughout the life of the mine, and will be removed during final

JAN 25 2018

reclamation.

37) Non-Potable Water Storage Tanks

Three non-potable water storage tanks are used to store water for mine-related purposes including dust suppression on roadways and other points as required by the approved Air Quality Order. The location of the non-potable water storage tanks is shown on Plate 5-2. The non-potable water storage tanks will remain throughout the life of the mine, and will be removed upon final reclamation.

40) Concrete Electrical Junction Box

The location of the concrete electrical junction box is shown on Plate 5-2. The concrete electrical junction box is a buried 6' by 6' by 6' concrete box with 6" thick walls, top and floor. A steel manhole allows access to the interior of the box. Within the junction box, high-voltage connections are made that allow power to be transferred from the Mine Substation to the overhead power lines. The concrete electrical junction box will remain throughout the life of the mine, and will be removed upon final reclamation.

41) Temporary Concrete Septic Tank

The temporary concrete septic tank facilitates the existing employees working on rotating shifts. The tanks are used in conjunction with the tanks that are a part of the bath house trailer (see #1 above) and other temporary office trailers (see #2 above). The tanks will be pumped out regularly. Multiple tanks are currently used. The locations of these tanks are shown on Plate 5-2. The temporary concrete septic tanks will be removed upon the completion of the long-term office areas and long-term bath house facilities.

MINE FACILITIES

14) Rock Dust Silo

The Rock Dust Silo is a tower silo used to store bulk rock dust for use within the mine. Rock dust is used to reduce the combustible fraction of coal dust in the air within the mine. The silo is constructed of a steel container supported by a steel frame on a concrete foundation with a 6" thick concrete pad and apron. The rock dust silo will remain throughout the life of the mine, and will be removed during final reclamation.

16) Temporary Underground Reclaim Room

The temporary underground reclaim rooms form a portion of the temporary coal handling facilities for the mine. The reclaim rooms are buried concrete and steel structures, measuring approximately 20' by 17' by 17' high. The floor, roof, and all walls, except one (1) wall, are constructed of steel

JAN 25 2013

reinforced concrete. The remaining wall is constructed of plate steel and steel angles, with an opening for a tubed conveyor structure. The roof of the structure has an opening and gate that allows coal to fall from the bottom of the stockpile above onto a conveyor belt for transportation to either the Crusher Building or Loadout Structure. Two (2) temporary underground reclaim rooms are currently in use. These structures are shown on Plate 5-2. At the completion of the long-term coal handline facilities' construction, the rooms will be filled with rocks and other backfill material, then left in-place after final reclamation.

17) Temporary Concrete Retaining Wall

The temporary concrete retaining walls form a portion of the temporary coal handling facilities for the mine. The walls are constructed of steel reinforced concrete, and provide support for conveyor assemblies emanating from the temporary underground reclaim rooms (see #16 above). Two (2) temporary concrete retaining walls are currently in use. These structures are shown on Plate 5-2. At the completion of the long-term coal handling facilities' construction, the temporary concrete retaining walls will be razed.

18) Temporary Loadout Conveyor (48")

The temporary loadout conveyor is a portion of the temporary coal handling facilities for the mine. The temporary loadout conveyor moves crushed coal from the temporary underground reclaim room (see #16 above) below the crushed coal storage pile to the top of the temporary loadout structure (see #20 below) in order to fill coal haulage trucks. The conveyor structure is a steel framework running a 48" conveyor belt. A large portion of the conveyor is contained within a 9' diameter steel plate tube that extends underground to the temporary underground reclaim room (see #16 above). The temporary loadout conveyor is shown on Plate 5-2. At the completion of the long-term coal handling facilities' construction, the temporary loadout conveyor will be removed.

19) Temporary Loadout MCC Building

The temporary loadout MCC building is a portion of the temporary coal handling facilities for the mine. The building is the Motor Control Center (MCC) for the temporary loadout conveyor (see #18 above). The structure is a steel plate building measuring approximately 6' by 16' by 8' tall. The electrical control for the conveyor motor and other electrical components for the temporary loadout assembly are housed within the MCC building. The temporary loadout MCC building is shown on Plate 5-2. At the completion of the long-term coal handling facilities' construction, the temporary loadout MCC building will be removed.

INCORPORATED

JAN 25 2013

20) Temporary Loadout Structure

The temporary loadout structure is a portion of the temporary coal handling facilities for the mine. The loadout structure is a wide flange steel-framed structure on a concrete foundation system, with a 6" thick concrete pad and apron. The top of the structure supports the motor that drives the temporary loadout conveyor (see #18 above). Coal is transferred, via the temporary loadout conveyor, from the crushed coal stockpile to the top of the loadout structure, where it falls through a spreader assembly into coal haulage trucks below for delivery off-site. The temporary loadout structure is shown on Plate 5-2. At the completion of the long-term coal handling facilities' construction, the temporary loadout structure will be removed.

21) Temporary Crusher Conveyor

The temporary crusher conveyor is a portion of the temporary coal handling facilities for the mine. The temporary crusher conveyor conveys coal from the temporary underground reclaim room (see #16 above) below the ROM coal stockpile to the temporary crusher / screen building (see #22 above) for sorting and crushing. The conveyor structure is a steel framework running a 48" conveyor belt. A portion of the conveyor is contained within a 9' diameter steel plate tube that extends underground to the temporary underground reclaim room (see #16 above). The temporary crusher conveyor is shown on Plate 5-2. At the completion of the long-term coal handling facilities' construction, the temporary crusher conveyor will be removed.

23) Temporary Crushed Coal Conveyor (48")

The temporary crushed coal conveyor is a portion of the temporary coal handling facilities for the mine. The temporary crushed coal conveyor conveys coal from the temporary crusher / screen building (see #22 above) that has been sorted and crushed on the Upper Pad to the crushed coal stockpile on the Middle Pad. The conveyor structure is a steel framework, supported by steel bents on concrete foundations, running a 48" conveyor belt. The temporary crushed coal conveyor is shown on Plate 5-2. At the completion of the long-term coal handling facilities' construction, the temporary crushed coal conveyor will be removed.

24) Temporary Crusher MCC Building

The temporary crusher MCC building is a portion of the temporary coal handling facilities for the mine. The building is the Motor Control Center (MCC) for the temporary crusher / screen building (see #22 above). The structure is a steel plate building measuring approximately 6' by 16' by 8' tall. The electrical control for the conveyor motors and other electrical components for the temporary crusher / screen building are housed within

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the MCC building. The temporary crusher MCC building is shown on Plate 5-2. At the completion of the long-term coal handling facilities' construction, the temporary crusher MCC building will be removed.

27) Concrete Equipment Pad

The concrete equipment pad is a portion of the temporary coal handling facilities for the mine. The pad is a 12" thick, steel reinforced concrete slab. The drive motor and take-up equipment for the temporary crushed coal conveyor (see #21 above) rest upon this concrete pad. The concrete equipment pad is shown on Plate 5-2. The concrete equipment pad will remain until final reclamation, at which point it will be buried with other concrete materials as described in the Reclamation Plan.

30) Existing ROM Coal Conveyor from Underground (60")

The ROM (Run of Mine) coal conveyor from underground is a part of the temporary AND long-term coal handling facilities for the mine. The ROM coal conveyor from underground ties into the coal conveyor system within the underground mine workings to convey mined coal from the working face to the surface. The surface portion of the ROM coal conveyor measures approximately 300' long. The assembly is a steel framework, supported by steel bents on concrete foundations, running a 60" conveyor belt. The ROM coal conveyor from underground is shown on Plate 5-2. The existing ROM coal conveyor from underground will remain through the life of the mine. The alignment and elevation of the conveyor structure are such that when the long-term coal handling system is constructed, the existing ROM coal conveyor structure will be extended to the future ROM coal stacking tube as shown on Plate 8-1. The entire assembly (existing and future) will be removed upon final reclamation.

31) Steel Portal Canopy Structure

A steel portal canopy structure is constructed at each portal of the mine. The canopy consists of steel wide flange posts and beams, and sheathed with steel plate. The canopy structure protects the portals (openings) to the underground workings. The canopies are constructed to meet MSHA regulations. Multiple steel portal canopy structures are utilized for the mine. The locations of the steel portal canopies are shown on Plates 5-2 and 5-2a, and in Appendix 5-9. The steel portal canopy structures will each remain throughout the life of the mine, or until its respective portal is no longer necessary and is sealed and reclaimed; whichever comes first. All remaining steel portal canopy structures will be removed during final reclamation.

32) Concrete Conveyor Bay at Belt Portal

The concrete conveyor bay at the belt portal is a portion of the temporary

INCORPORATED

AND long-term coal handling facilities for the mine. The bay was originally used to house the belt drive for the original ROM conveyor structure, which has since been removed. The concrete conveyor bay now cradles and supports the westernmost end of the ROM coal conveyor from underground (see #30 above) at the surface. The concrete conveyor bay is shown on Plate 5-2. The concrete conveyor bay will remain in place for the life of the mine, and will be removed upon final reclamation.

34) Mine MCC Building / Electrical Tower

The Mine MCC (Motor Control Center) building is the main hub for electrical power running from the surface to the underground mine workings. Nearly all power to the underground mine equipment runs through this 21' by 12' by 11.5' tall, steel plate building. The Mine MCC building shares a concrete foundation with an electrical tower that is approximately 45.5' tall, and constructed of 10"x10" tube steel. The electrical tower receives overhead power lines extending from the Mine Substation (see above). Some power lines extend to the Main Mine Ventilation Fan (see #36 below), but most power runs to a transformer at the base of the tower, then into the Mine MCC Building for distribution to the underground mine workings. The Mine MCC Building, Electrical Tower and transformer all share a common poured concrete foundation. The Mine MCC Building / Electrical Tower assembly is shown on Plate 5-2. The Mine MCC Building / Electrical Tower will remain through the life of the mine, and the entire assembly and foundation will be removed upon final reclamation.

35) Backup Ventilation Fans

The original ventilation fans for the mine remain in-place on a concrete foundation. These fans are attached to Portal #0. When the main mine ventilation fan (see #36 below) came online, the original ventilation fans became the backup ventilation fans. The backup ventilation fans are 250 horsepower fans that will blow fresh air into the mine's underground workings in the event that the main mine ventilation fan (see #36 below) fails. The backup ventilation fans are shown on Plate 5-2. The backup ventilation fans and their respective concrete foundation will remain in-place through the life of the mine, and will be removed at final reclamation.

36) Main Mine Ventilation Fan / Electrical Tower

The main mine ventilation fan is a 1,500 horsepower blowing fan, located on the ledge that is the exposed top of the Sunnyside Sandstone, at the North Breakout of the underground workings. The fan's purpose is to blow fresh air into the underground mine workings for mine personnel throughout the mine, and to ventilate all open areas within the mine. The fan blows into Portal #2 of the North Breakout. The main mine ventilation fan rests on a

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JAN 25 2008

poured concrete foundation that it shares with a 35' tall electrical tower, similar to the electrical tower at the Mine MCC Building (see #34 above). Overhead power transmission lines (see #12 above) extend from the Mine MCC Building/Electrical tower (see #34 above) to provide power for the main mine ventilation fan. The main mine ventilation fan and associated concrete pad and electrical tower have been constructed to meet MSHA regulations and requirements. The location of the Main Mine Ventilation Fan is shown on Plate 5-2. The fan, electrical tower and concrete foundation will remain throughout the life of the mine, and will be removed upon final reclamation.

39) Chain Link Fencing

Six foot high chain-link fencing has been, and will be installed as shown on Plate 5-2. The fencing will be constructed to protect the public and wildlife from the Mine Substation (see above) and along sections of County Road RS-2477, along the western edge of the permit boundary. The fencing will remain throughout the life of the mine, and will be removed upon final reclamation.

43) Temporary Conveyor Counterweight Structure

The temporary conveyor counterweight structure adds weight to conveyor belts to keep them taut during operation. The Temporary Loadout Conveyor (see #18 above) and the Temporary Crusher Conveyor (see #21 above) each have a temporary conveyor counterweight structure. The structure is constructed of a steel framework that guides the counterweight for the respective conveyor. The structure rests on a 12" thick, steel reinforced concrete slab. The locations of the temporary conveyor counterweight structures are shown on Plate 5-2. Upon the completion of the long-term coal handling facilities' construction, the temporary conveyor counterweight structures will be removed.

44) Jersey Barrier Guard Rails

A Jersey Barrier is a prefabricated, modular concrete barrier used to guide vehicular traffic and minimize damage in cases of incidental contact. When placed end-to-end, these barriers prevent vehicles from running off designated roadways. Jersey barrier guard rails are installed according to MSHA requirements. The locations of the jersey barrier guard rails are shown on Plate 5-2. The jersey barrier guard rails will be utilized throughout the life of the mine and will be removed upon final reclamation.

45) Concrete Trash Chute

The concrete trash chute is used for deposition and storage of trash until the refuse can be hauled to a nearby State-approved solid waste disposal area (landfill). The trash chute is constructed of concrete walls and floor, open at

one end to allow for vehicles to dump and remove trash as necessary. Chain link fencing will be stretched horizontally across a portion of the top of the chute to prevent the wind from blowing lighter pieces of trash out of the enclosure. The location of the Concrete Trash Chute is shown on Plate 5-2. The concrete trash chute will remain through the life of the mine, and will be removed upon final reclamation.

SUPPORT FACILITIES

Mine Facilities Access Road / Truck Loadout Road

The mine facility road, shown on Plate 5-2, begins at the edge of County Road 164 (Lila Canyon Road), and allows for access to the Lower Pad and the temporary loadout structure (see #20 above). 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 on the Lower Pad. Coal haul trucks use this road to access the temporary truck loadout (see #20 above) on the Middle Pad. All supplies will be hauled on a short portion of this road from the Lower Pad and Storage Area Pad to the slope access road. The road is paved with crushed granite and is regularly watered with a sprinkler system in order to minimize dust and provide a good surface for heavy truck traffic, as well as facility access. The facility access road is approximately 30' wide to provide for two-lane traffic, and has the appropriate drainage controls to insure long term life and low maintenance. The road has been constructed according to the appropriate R645-534 and R645-527 regulations. The road will remain throughout the life of the mine, and will be removed upon final reclamation.

Rock Slopes

Access to the underground workings of the Lila Canyon Mine is provided through two rock slopes driven from the top of the Mancos shale, sloping up to the intersection of the coal seam. One portal provides access for men, equipment and material to the mine. The second access slope contains the underground portion of run-of-mine belt line that attaches to the existing ROM Coal Conveyor from Underground at the surface (see #30 above) that transports mined coal to the run of mine stock pile at the Upper Pad. The two rock slopes incline upward at approximately 12%, from a starting elevation of approximately 6150'. The intersection of the coal seam and the rock slope takes place at approximately the 6,300 feet elevation. The lengths 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 has been used as fill material for the pads of the surface facilities. The rock slope material / underground development waste contains mostly

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shale, sandstone and mudstone. Traces of coal may be found, but the amount is 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 and rock slope material fill locations are shown on Plate 5-2. The rock slopes will be sealed at the portals according to MSHA regulations at the completion of mining operations, and reclaimed per the Reclamation Plan.

Sediment Ponds

The sediment ponds have been designed to provide for adequate sediment protection for the project area. Surface water running off disturbed areas will be routed into the sediment ponds. The sediment ponds have been designed according to the appropriate R645 regulations, and the designs can be found in Appendix 7-4, and Plates 7-6a and 7-6b. Because the sediment ponds do not meet the requirement of 30 CFR 77.216(a), an MSHA number for the sediment ponds is not required. Sediment Pond #1 is located on the southwest corner of the property. Sediment Pond #2 is located on the northwest corner of the property. Both ponds are shown on Plate 5-2. Please refer to Chapter 7 for detailed information on drainage reporting to both ponds. Both sediment ponds will remain through the life of the mine, and will be removed during final reclamation according to the approved reclamation plan.

Slope Access Road / Portal Access Road

The slope access road connects to the facility access road near the northeast corner of the Middle Pad, and follows an alignment that takes into consideration grade and direct access. The slope access road is used to provide access to the rock slopes (see above), which in-turn provides access to the underground workings. The slope access road is used as access for all men, material and equipment needed within 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 has been designed, constructed, and maintained according to appropriate R645 regulations. The slope access road is shown on Plate 5-2. The slope access road will remain throughout the life of the mine, and will be removed during final reclamation.

New Storage Pad

A new supply and materials storage pad will be constructed directly south of the Mine Substation (see above), but within the existing disturbed boundary line as shown on Plate 5-2. The new pad will be constructed similarly to the existing Lower, Middle and Upper Pads (see Chapter 2, Section 232.500), with a gravel covering. The new storage pad is needed so large trucks

delivering and/or collecting materials and supplies will not congest the parking and supply areas already in-place on the Lower Pad, or interfere with the Mine Facilities Access Road / Truck Loadout Road (see above) and trucks preparing to load coal or loaded trucks hauling coal from the mine site. Moving the delivery trucks to the new storage pad will reduce vehicular congestion, and decrease the possibility of accidents resulting from said congestion. The new storage pad will be utilized throughout the life of the mine, and will be reclaimed per the Reclamation Plan.

New Storage Pad Access Road

The new storage pad access road will extend from the Middle Pad to the New Storage Pad (see above), which lies just south the Mine Substation (see above). The new storage pad access road will be used to provide access between the two pads for mine personnel, equipment and supplies. Since the new storage pad access road will provide access for men, equipment and materials for a period of six months or longer, the new storage pad access road is classified as a primary road, and will be paved. The new storage pad access road has been designed and will be constructed and maintained according to appropriate R645 regulations. The new storage pad access road is shown on Plate 5-2. The new storage pad access road will remain throughout the life of the mine, and will be removed upon final reclamation.

New Storage Pad Service Road

The new storage pad service road, shown on Plate 5-2, will begin at the edge of County Road 164 (Lila Canyon Road), and will allow for access to the new storage pad (see above) directly south of the Mine Substation (see above). The first approximately 350 feet of the new storage pad service road from County Road 164 (Lila Canyon Road) will be a reworking of the existing County Road RS-2477. The new storage pad service road will then continue to the new storage pad (see above). The new storage pad service road will be approximately 30 feet wide and provide access for trucks to deliver and/or collect supplies, materials or equipment related to mine activities, without increasing congestion on the mine facilities access road / truck loadout road (see above). Since the new storage pad service road will provide access for men, equipment and materials for a period of six months or longer, the new storage pad service road is classified as a primary road, and will be paved. The new storage pad service road has been designed and will be constructed and maintained according to appropriate R645 regulations. The new storage pad service road is shown on Plate 5-2. The new storage pad service road will be removed during the course of construction of the long-term coal handling facilities. The portion of the new storage pad road that lies along the existing County Road RS-2477 may remain or be reclaimed.

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The BLM and Emery County will be consulted when appropriate, and the Division will be advised as to the course of action for the roadway (remain or be reclaimed). Access to the new storage pad (see above) will be rerouted through the new truck loadout road when the long-term truck loadout road is completed. When this happens, the existing truck loop will become the new truck loading/unloading area per Plate 8-1 for the future warehouse on the Upper Pad.

Topsoil Pile

The topsoil pile has been located on the southwest 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. The topsoil will be redistributed across the disturbed area according to the mine reclamation plan.

6) Temporary Concrete Walkway

Temporary concrete walkways have been constructed at temporary buildings, the temporary bath house (see #1 above) and temporary office trailers (see #2 above). The walkways are generally 6' wide by 4" thick. The locations of the temporary concrete walkways are shown on Plate 5-2. The temporary concrete walkways will be removed as their respective temporary buildings are removed.

15) Temporary Fuel Storage Tanks

The temporary locations of the fuel storage tanks are on the Middle Pad as shown on Plate 5-2. The tanks are bulk fuel storage tanks containing gasoline or diesel fuel for mine vehicles. The tanks are supported by steel legs above integral steel secondary containment basins. Upon completion of the long-term surface facilities' construction, the fuel tanks will be relocated to their long-term location on the Upper Pad, as shown on Plate 8-1. The fuel tanks will remain in their long-term locations for the life of the mine, and will be removed upon final reclamation.

25) Diversion Weir with Slide Gates

A weir constructed of steel-reinforced concrete will be constructed across disturbed area ditch DD-14a (see Chapter 7). The weir will support two (2) slide gates to direct surface water flow to the undisturbed culvert UC-1 or to Sediment Pond #1. During times of precipitation and/or active surface runoff within the disturbed area boundary, water flowing in ditch DD-14a will be diverted to Sediment Pond #1. Otherwise, any flowing surface water will be directed to the undisturbed culvert UC-1 and bypass the pond in accordance

with the current UPDES permit. The location of the diversion weir with slide gates is shown on Plate 5-2. The diversion weir will remain throughout the life of the mine and will be removed during final reclamation.

29) Sediment Pond Spillway Structure

As shown on Plate 5-2, and in Chapter 7, Sediment Ponds #1 and #2 each have a spillway structure constructed of corrugated metal pipe to allow for surplus water to exit the respective pond. Each spillway is equipped with an oil skimmer structure. See Plates 7-6a and 7-6b for detailed drawings. The sediment pond spillway structures will remain throughout the life of the mine and will be removed during final reclamation.

38) 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.

42) Temporary Loadout Light Board

The temporary loadout light board consists of a free standing metal post pedestal with traffic control lights for the temporary loadout structure (see #20 above). The pedestal is mounted upon a steel reinforced concrete pad. The lights provide information to coal haul truck drivers as coal is loaded into their trucks at the temporary loadout structure. The temporary loadout light board location is shown on Plate 5-2. Upon the completion of the long-term coal handling facilities' construction, the temporary light board and concrete support pad will be removed.

Long-Term Underground Pipes

The locations of the long-term 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 as required. Long-term underground pipes will be abandoned and left in place upon final reclamation.

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 7-5. A summary of the culverts follows:

<u>Culvert</u>	<u>Length</u>	<u>Size</u>
DC-1	72'	24"
DC-2	60'	18"
DC-3	65'	18"
DC-4	400'	24"

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DC-5	350'	24"
DC-6	107'	24"
DC-7	155'	24"
DC-8	167'	24"
DC-9	186'	24"
DC-10	60'	24"
DC-11	101'	24"
DC-12a	140'	24"
DC-12b	79'	24"
DC-12c	357'	24"
DC-12d	9'	24"
DC-13	60'	24"
DC-14	40'	24"
DC-15	45'	18"
DC-16	25'	18"
DC-17	120'	18"
DC-18	27'	18"
SP2-1	165'	18"
UC-1	480'	60"

As per the approved Air Quality Order and R645-201-534.300, all primary roads will be paved or surfaced with rock, crushed gravel, asphalt or other approved material. Roads and pad areas used by mobile equipment will be treated with water or other 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 Plates 5-1 and 2-2 show 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 have been prepared and certified by or under the direction of a registered professional

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engineer.

Doelling lists several coal mines and mining activity 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, and used for historical purposes only.

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

521.122 There are no subsurface man-made features,

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other than the culverts discussed in 521.200, within, passing through, or passing over the proposed permit area.

- 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, 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.
- 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 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.

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 have 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 Plates 5-2 and 8-1, as well as others.

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- 521.162** The 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. Plates 5-2 and 8-1, as well as others, show the area for which the performance bond will be posted. All disturbed areas within the permit boundary have been bonded.
- 521.164** Existing coal storage and loading areas are shown on Plates 5-2 and certified as required. Future coal storage and loading areas are shown on Plate 8-1 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 conveyors maintained within the permit are shown with descriptions of roads, embankments, culverts, and drainage structures are presented in section 520 and are shown on Plates 5-2, 7-2, and 7-5.
- 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.

INCORPORATED

JAN 25 2018

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 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 projected, 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

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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, 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 mines. 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 are 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 are described in this permit application.

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- 524.110** Surface blasting involving 5 lbs. of explosives or more will be done 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 exists 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

- dwelling 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 are 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 placed 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 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.
- 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.

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JAN 25 2008

- 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 records.
 - 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

INCORPORATED

JAN 25 2018

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 Plate 5-3 (Confidential) shows the eagle nests that potentially could be diminished or interrupted by subsidence.

525.120 SUBSIDENCE POTENTIAL

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

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JAN 25 2008

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 result 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

INCORPORATED

JAN 25 2009

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 six 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' x 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 amounts 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: 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.

INCORPORATED

JAN 25 2018

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 Emery County's 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.

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- 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 an office complex, sediment ponds, 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 prevent or control erosion and siltation, water pollution, and damage to public or private property, and:

526.222 The new facilities designs shown in Appendix 5-4 minimize damage to fish, wildlife, and related environmental values; and minimize 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 the 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. Complete designs are presented in Appendix 5-4.

The drain field design and layout are 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 coal chunks 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 an as needed basis. The designated noncoal waste area (concrete trash chute) 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 an as-needed basis.

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- 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.

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- 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** Two impoundments are planned for this site: Pond #1 and Pond #2. The sediment ponds are temporary structures. A detailed design for the Sediment ponds can be found in Appendix 7-4, Section 3.1; and on Plates 7-6a and 7-6b.
- 533.210** The sediment ponds 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 Plates 7-6a and 7-6b.
- 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 Plates 7-6a and 7-6b.
- 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 Plates 7-6a and 7-6b.
- 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; and on Plates 7-6a and 7-6b.
- 533.500** This section does not apply. There are no vertical highwalls associated with this impoundment.

INCORPORATED

- 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** Non-acid 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, and 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 40.26 surface acres within the disturbed area but only 37.02 acres will be disturbed leaving 3.84 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 2-3. 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, except for the upgraded portion of County Road #R.S. 2477. At the time of reclamation, the Bureau of Land Management (BLM) and Emery County will be given the option of keeping the upgrades to this portion of the roadway, reclaim the roadway to its original condition. The Division will be notified of the final decision.
- 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 except for the upgraded portion of the Emery County Road #R.S. 2477. Minimal closures may be required for the upgraded portion, if it is reclaimed.
- 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.

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.

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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.

552. Permanent Features.

552.100. In the 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 sealed 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 (berms, channels and silt fence) and the use of small depressions, 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.

INCORPORATED

- 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 is 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 over laid 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.

JAN 25 2018

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.

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.

INCORPORATED

JAN 25 2018

Chapter 7

763. Siltation Structures	Page 90
764. Structure Removal	Page 90
765. Permanent Casing and Sealing of Wells	Page -90

List of Appendices

Appendix 7-1	Baseline Monitoring
Appendix 7-2	Water Monitoring Data (Horse Canyon)
Appendix 7-3	Probable Hydrologic Consequences
Appendix 7-4	Sedimentation and Drainage Control Plan
Appendix 7-5	U.P.D.E.S. Permits
Appendix 7-6	Seep/Spring Inventory
Appendix 7-7	Surface Water Characterizations
Appendix 7-8	Monitoring Location Descriptions
Appendix 7-9	Right Fork of Lila Canyon Flow and Geomorphic Evaluation
Appendix 7-10	Peak Flow Calculations
Appendix 7-11	Pump Information For Piezometers

List of Plates

Plate 7-1	Permit Area Hydrology
Plate 7-1A	Permit Area Hydrology (Geologic Map)
Plate 7-1-B	Hydro-Geologic Cross Section
Plate 7-2	Disturbed Area Hydrology & Water Shed Map
Plate 7-3	Water Rights
Plate 7-4	Water Monitoring Locations
Plate 7-4a	Water Monitoring Locations - Surface Facilities
Plate 7-5	Proposed Sediment Control
Plate 7-6a	Proposed Sediment Pond #1
Plate 7-6b	Proposed Sediment Pond #2
Plate 7-7	Post Mining Hydrology

INCORPORATED

JAN 25 2018

List of Figures

Div. of Oil, Gas & Mining

Figure 7-1	Stratigraphic Section	End of Chapter
Figure 7-2A	Water Level Map - Spring and Fall 2002	End of Chapter
Figure 7-2B	Seasonal Water Level Fluctuations in Piezometers	End of Chapter
Figure 7-3	Spring and Tributary Recharge Schematic	End of Chapter
Figure 7-4	Range Creek Recharge Evaluation	End of Chapter
Figure 7-5	Photograph of Water Right 91-4649	End of Chapter

List of Tables

Table 7-1	1985 Spring & Seep Survey Results	Page 10
Table 7-1A	Peak Flow Simulations of Undisturbed Drainages in the Lila Canyon Mine Area	Page 27

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 5-2, 5-2A, 7-1 and 7-2. These maps

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.

INCORPORATED
JAN 25 2018

- (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

731. General Requirements This will be an underground mine with approximately 40.26 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

INCORPORATED

disturbed area runoff to sediment ponds 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.;

INCORPORATED

JAN 25 2018

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 and 5-2a. 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

INCORPORATED

JAN 25 2013

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 structures for this site are the sediment ponds. All disturbed area runoff is proposed to be directed to these ponds for final treatment prior to discharge.

The sediment ponds will be constructed and maintained in compliance with applicable regulations. Details of the proposed ponds 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 ponds will be located at the low points of the disturbed area, as shown on Plate 7-5.

732.210 Sediment Pond Details The proposed sediment ponds are considered temporary, and will be removed during final reclamation. The ponds are designed in compliance with the requirements of the following sections, as required **INCORPORATED**

356.300 - The ponds 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 ponds' areas will be reclaimed and reseeded according to the reclamation plan;

513.200 - N/A - The proposed sediment ponds do 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 ponds and site drainage controls 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 ponds do 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 impoundments proposed for this site are the sediment ponds. 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 two sedimentation ponds 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 ponds are 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 ponds are provided in Appendix 7-4.

INCORPORATED

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 ponds are classed as temporary.

733.210 Design Requirements The proposed sediment ponds are temporary; therefore, the ponds are not designed to meet requirements of MSHA 30 CFR 77.216.

The proposed ponds are not located where failure would expect to cause loss of life or serious property damage. As shown in Appendix 7-4, the proposed pond embankments 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 ponds are temporary impoundments, 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.

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- 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 40.26 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 sediment ponds, 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 ponds 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

INCORPORATED

JAN 25 2018

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 ponds are 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

747.200 As shown on Plates 5-2 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.

The current General UPDES Permit allows one million gallons of discharge (total) from Sediment Pond #1 and from the Mine Portal into Grassy Wash. UtahAmerican Energy is considering an individual permit for the potential of increased volume of mine portal water discharge. UtahAmerican Energy will inform the Division if/when an individual permit is issued.

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.

INCORPORATED

- 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 ponds will remain in place until Phase II Bond Release requirements have been met. At that time, the ponds will be removed and the areas 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. The County road will be left in place to reach the sediment pond and for public use. This road will be removed and reclaimed when the sediment pond is removed.

or remain according to the recommendations of the Bureau of Land Management (BLM).

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 ponds 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 ponds will be removed and the area reclaimed.

763.200 Structure is Removed Upon removal of the sediment ponds, 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.

INCORPORATED

JAN 25 2013

Appendix 7-4

**Appendix 7-4
Lila Canyon Mine
Sedimentation and Drainage Control Plan**



Revised

January 2001
October 2002 RJM
February 2007 TJS
April 2008 TJS
July 2008 TJS
June 2009 TJS
January 2010 TJS
January 2012 TJS
October 2014 TJS

December 2015 KM-PJ
November 2016 PJ/KM
June 2017 PJ

INCORPORATED

JAN 25 2018

Div. of Oil, Gas & Mining

SEDIMENTATION AND DRAINAGE CONTROL PLAN

TABLE OF CONTENTS

Section	Page Number
1- Introduction:	Page -1-
2- Design of Drainage Control Structures:	Page -3-
3- Design of Sediment Control Structures:	Page -41-
4- Design of Drainage Control Structures for Reclamation:	Page -54-
5- Alternate Sediment Control for Fan, Water Treatment, and Topsoil Sites	Page -59-

INCORPORATED

JAN 25 2018

Div. of Oil, Gas & Mining

SEDIMENTATION AND DRAINAGE CONTROL PLAN

1- Introduction

The Sedimentation and Drainage Control Plan for the Lila Canyon Mine has been designed according to the State of Utah R645- Coal Mining Rules, November 1, 1996. All design criteria and construction will be certified by a Utah Registered Professional Engineer.

This plan has been divided into the following three sections:

- 1) Design of Drainage Control Structures for the Proposed Construction
- 2) Design of Sediment Control Structures
- 3) Design of Drainage Control Structures for Reclamation

The general surface water control plan for this project will consist of the following:

- (a) This is a new site construction. All areas proposed for disturbance will be sloped to drain to surface ditches and/or culverts where runoff will be carried to two sediment ponds. All minesite drainage controls and watersheds are shown on Plate 7-5 "Proposed Sediment Control Map" and Plate 7-2 "Disturbed Area Hydrology and Watershed Map," respectively.
- (b) The majority of undisturbed runoff will be diverted around the minesite and/or beneath the Sediment Pond #1 by properly sized culverts. Undisturbed diversion culvert UC-1, is located on the southwest end of the site. This diversion will allow the majority of undisturbed runoff from the Right Fork of Lila Canyon to bypass the mine area beneath Sediment Pond #1. All undisturbed diversions are designed to carry runoff from a 100 year - 6 hour precipitation event. UC-1 is oversized at 60" diameter.

- (a) NOTE: In the fall of 2016, a massive storm event caused a large portion of culvert UC-1 to become plugged. Blockage in the culvert is so extensive that removing the debris blocking the culvert would be an enormous undertaking. The Operator has determined that replacing a large portion of the UC-1 culvert will be a safer and more cost-effective solution than clearing the debris from the existing culvert. Therefore, a new 60" culvert (UC-1a) will be constructed from the inlet location of UC-1 and extending

below Sediment Pond #1, then attaching to UC-1 near the spillway structures. The plugged portion of UC-1 will be cut and removed as required for the installation of the new section of culvert. The remaining section of existing culvert will be abandoned and sealed in place. All sections of the culvert will remain until final reclamation. During final reclamation, all sections (including the abandoned portions) of UC-1 and UC-1a will be removed in accordance with the approved reclamation plan.

- (c) Two adequately sized sediment ponds will be constructed at the lower end of the site. These ponds are sized to contain and treat the runoff from all of the disturbed area and any contributing undisturbed areas for a 10 year - 24 hour precipitation event. The ponds will be equipped with C.M.P. culvert principle spillway and decant and CMP culvert emergency spillway sized to safely pass runoff from a 25 year - 6 hour precipitation event. The spillways from Sediment Pond #1 will discharge into the UC-1 CMP culvert running beneath the pond. This culvert will discharge onto an engineered discharge structure and into the Right Fork of Lila Canyon channel below the minesite. The spillways from Sediment Pond #2 will discharge onto an engineered discharge structure and into the Middle Fork of Lila Canyon channel, below the minesite.

DESIGN OF DRAINAGE CONTROL STRUCTURES

Design Parameters:

- 2.1 Precipitation
- 2.2 Flow
- 2.3 Velocity
- 2.4 Drainage Areas
- 2.5 Slope Lengths
- 2.6 Runoff
- 2.7 Runoff Curve Numbers
- 2.8 Culvert Sizing
- 2.9 Culverts
- 2.10 Main Canyon Culvert - Outlet Structure
- 2.11 Ditches

Tables:

- Table 1 Undisturbed Watershed Summary
- Table 2 Disturbed Watershed Summary
- Table 3 Watershed Parameters
- Table 4 Runoff Summary - Undisturbed Watershed (Not Draining to Pond)
- Table 5 Runoff Summary - Watersheds Draining to Sediment Pond
- Table 6 Runoff Control Structure - Watershed Summary
- Table 7 Runoff Control Structure - Flow Summary
- Table 8 Disturbed Ditch Design Summary
- Table 9 Disturbed Culvert Design Summary
- Table 10 Undisturbed Culvert Design Summary

Figures:

- Figure 1 Culvert Nomograph
- Figure 2 Rip-Rap Chart
- Figure 3 Disturbed Ditch Typical Section
- Figure 4 Trash Rack - Culvert Inlet - Typical Section
- Figure 4A UC-1 Culvert Outlet
- Figure 7.26 Design of Outlet Protection - Barfield et al.

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Design Parameters

2.1 Precipitation

The precipitation-frequency values for the area were taken from the approved Mining and Reclamation Plan, Horse Canyon Mine, Emery County, Utah, Volume III, submitted by I.P.A.

Frequency - Duration	Precipitation
10 year - 6 hour	1.30"
10 year - 24 hour	1.90"
25 year - 6 hour	1.50"
100 year - 6 hour	1.90"

2.2 Flow

Peak flows were determined from rainfall depths, drainage areas, and curve numbers and were calculated using the computer program “Triangular Hydrograph Calculations”, based on SCSHYDRO Program developed by Hawkins and Marshall (1979) prepared for the Division of Oil, Gas, and Mining.. All flows are based on the SCS Curve Number Method for both SCS 6-hour and NOAA Type II, 24-hour storms.

Time of concentration of storm events were calculated for each drainage area using SCS Lane’s Formula. (U.S. Soil Conservation Service, 1972):

$$L = \frac{l^{0.8} * (S + 1)^{0.7}}{1900 * Y^{0.5}}$$

and

$$Tc = 1.67 * L$$

where L = watershed lag (hours)

l = hydraulic length of the watershed, or distance along the main channel to the watershed divide (feet)

S = watershed storage factor defined in Equation (2-2)

Y = average watershed slope (percent)

Tc = time of concentration (hours)

2.3 Velocity

Flow velocities for each ditch structure were also calculated using the Storm computer program with Manning’s Formula:

where:

$$V = \frac{1.49}{n} * R^{2/3} * S^{1/3}$$

- V = Velocity (fps)
- R = Hydraulic Radius (ft.)
- S = Slope (ft. per ft.)
- n = Manning’s n; Table 3.1, p. 159,

“Applied Hydrology and Sedimentology for Disturbed Areas”, Barfield, Warner & Haan, 1983.

Note: The following Manning’s n were used in the calculations:

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Structure	Manning's n
Culverts (cmp)	0.024
Culverts (HDPE)	0.013
Unlined Disturbed Area Ditches	0.030
Lined Disturbed Area Ditches	0.032 - 0.040

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JAN 25 2018

2.4 Drainage Areas

All drainage areas were determined directly from Plate 7-1, "Permit Area Hydrology Map", Plate 7-2, "Disturbed Area Hydrology/Watershed", or Plate 7-5 "Proposed Sediment Control".

2.5 Slopes, Lengths

All slopes and lengths were measured directly from the topography on Plates 7-1, 7-2, and/or 7-5.

2.6 Runoff Volume

Runoff was calculated using the SCS Curve Number formula for both NOAA Type II, 24-hour and SCS 6-hour storms; using the SCSHYDRO computer program:

$$Q = \frac{(P - 0.2S)^2}{P + 0.8S}$$

where:

Q	=	Runoff in inches
P	=	Precipitation in inches
		$S = \frac{1000}{CN} - 10$
CN	=	Runoff Curve Number

2.7 Runoff Curve Numbers

Two curve numbers were utilized for the undisturbed areas. Areas with milder slopes (less than 30%) were given a runoff curve number of 75. All other undisturbed areas (30% slope or greater) were given a runoff curve number of 83. These numbers were taken directly from the approved "Mining and Reclamation Plan, Horse Canyon Mine, Emery County, Utah, Volume III", submitted by I.P.A. The numbers in that plan were based on vegetation and soils data from on-site.

A runoff CN of 90 is used for all disturbed areas. This value is based on commonly used and approved values and from Table 2.20, (p. 82, Barfield, et al, 1983).

The following is a summary of runoff curve numbers used in these calculations:

Watershed	Runoff CN
Undisturbed (<30% slopes):	75
Undisturbed (>30% slopes):	83
Disturbed:	90

2.8 Culvert Sizing

Minimum culvert sizing is based on either the inlet control nomograph or Manning's Equation. Culverts were evaluated for inlet control conditions to determine the minimum pipe size using the Culvert Nomograph included as Figure 1 of this Appendix. If the pipe had a HW/D ratio equal to or greater than 1.0 or the slope were less than 2% the Hydraulic Toolbox, Version 4.0 or later version computer program was used to determine the pipe flow diameter using:

$$D = \left(\frac{2.16 Q n}{\sqrt{s}} \right)^{0.35}$$

where: D = Required Diameter (feet)
 Q = QP = Peak Discharge (cfs)
 n = Roughness Factor (0.025 for CMP)
 S = Slope (ft. per ft.)

2.9 Culverts

Culverts have been sized according to the calculations previously described, and are shown on Plate 7-5, "Proposed Sediment Control". Culverts carrying undisturbed drainages are designated with UC- Letters (i.e. UC-1). All undisturbed area drainage culverts will be fitted with trash racks to minimize plugging by rocks or other debris.

Trash racks will be provided at the inlet for all undisturbed drainage culverts. These will consist of 3/4" steel bars welded on 6" centers across the flared inlet structures of each culvert. Bars will be sloped from the front of the inlet structure up to the top of the culvert. This ramp configuration will allow trash, branches and other potential obstructions to be swept up and away from the inlet rather than being impinged against the grates during a flow event. Rip rap will be placed around the flared inlet structure and above it to a height of at least 6" above the required headwall for each culvert. (See Figure 4 for details). Trash racks will be checked on a routine schedule and following precipitation events and all trash, branches and other obstructions will be removed.

It should be noted that all undisturbed area culverts are adequately sized to handle the expected runoff from a 100 year - 6 hour event for maximum protection of the mine area, sediment pond and undisturbed drainage. This is well in excess of the 10 year - 6 hour event required by the regulations and is proposed as an extra measure of safety.

Disturbed area culverts and ditches are shown on the "Proposed Sediment Control", Plate 7-5. Culverts carrying disturbed drainage are designated with a DC-number (i.e. DC-1). Calculations for all disturbed area culverts and ditches are also included with this report, along with design criteria. Disturbed drainage areas draining to culverts and ditches are marked with a DA-number (i.e. DA-1).

Culverts will be inspected regularly, and cleaned as necessary to provide for passage of drainage flows. Inlets and outlets shall also be maintained so as to prevent plugging or undue restriction of water flow.

All disturbed area culverts are temporary, and will be removed upon final reclamation.

2.10 Main Canyon Culvert - Outlet Structure

The outlet of culvert UC-1 has been designed to flow onto a rip-rap apron to protect against scouring and to allow for energy dissipation. The rip-rap apron is designed to fit the natural channel configuration as closely as possible, and will allow runoff to re-enter the natural channel at a reduced velocity which is no greater than natural flow conditions. Runoff from the 100 year - 6 hour precipitation event in the canyon below the minesite has been calculated at 55.60 cfs, including sediment pond overflow.

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The rip-rap apron design is based on Figure 7-26, Design of Outlet Protection - Maximum Tailwater Condition, "Applied Hydrology and Sedimentology for Disturbed Areas", Barfield, Warner and Haan, 1983. Based on the figure, the apron should be a minimum of 15' in length, widening from 5' to 9', with a 0.1% slope. The proposed length has been increased to 20', to ensure adequate time for velocity reduction. The apron slope is kept at 0.1%. Rip-rap size is conservatively placed at 12" D_{50} . Rip-rap will be placed to a depth of 1.5 D_{50} and will be placed on a 6" layer of 2" drain rock filter. Rip-rap will also be placed on the 2H:1V side slopes to the height of the culvert (5') at the culvert outlet tapering to 3' at the outlet of the apron. This rip-rap apron has been sized and designed to adequately dissipate energy from flow velocities of a 100 year - 6 hour precipitation event and resist dislodgement. The drain rock filter bed will also serve to secure the rip-rap boulders firmly in place, to add an additional element of stability, and prevent scouring underneath the armored apron. (See Figure 4A for construction details). The natural channel below the culvert has a gradient of approximately 7.76%. When the flow is routed from the culvert across the apron to the natural channel, the velocity is reduced from 6.31 fps at the culvert outlet to 1.54 fps at the outlet of the apron. (See Culvert Outlet Rip-Rap Apron Flow Velocity Calculations in Appendix 1.)

It should be noted that these calculations are based on a 100 year - 6 hour event.

Please see Part (a) of Section (b) on Page 1 regarding changes to UC-1 due to a massive storm event in 2016.

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2.11 Ditches

All ditches will carry disturbed area drainage to the ponds. Ditches are shown on the "Proposed Sediment Control", Plate 7-5, and are designated with a DD-number (i.e. DD-1 for Disturbed Area Ditches) or UD-number (i.e. UD-1 for Undisturbed Area Ditches).

All ditches are designed to carry the expected runoff from a 10 year - 6 hour event with a minimum freeboard of 0.5' (See Table 8 and Figure 3).

Ditches which exhibit expected flow velocities of 5 fps or greater will be lined with rip-rap. A typical cross-section is shown on Figure 3 and flow depths and areas for all lined and unlined ditches are presented in Table 8 of this report.

Ditch slopes have been determined from Plates 7-2 and 7-5.

All ditches will be inspected regularly, and maintained to the minimum dimensions to provide adequate capacity for the design flow. All ditches are temporary and will be removed as described under the reclamation hydrology section. (Section 4)

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TABLE 1

Undisturbed Watershed Summary		
Watershed	Drains To	Final
UA-1	UC-1/UC-1a	Right Fork Lila Canyon
UA-2	DD-1	Sediment Pond
UA-3	DD-1	Sediment Pond
UA-4	Sediment Pond	Sediment Pond
UA-5a	Removed	
UA-5b	Removed	
UA-6a	DD-2	Sediment Pond
UA-6b	DD-2	Sediment Pond
UA-7	ASCA Area	Left Fork Lila Canyon
UA-8	County Road Culvert	Right Fork Lila Canyon

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TABLE 2

Disturbed Watershed Summary		
Watershed	Drains To	Final
DA-1	DD-1	Sediment Pond
DA-2	DD-2	Sediment Pond
DA-3	DD-3	Sediment Pond
DA-4	DD-4	Sediment Pond
DA-5	DD-5a	Sediment Pond
DA-6a	DC-6a	Sediment Pond
DA-6b	DC-6b	Sediment Pond
DA-7	DC-7	Sediment Pond
DA-8	DC-8	Sediment Pond
DA-9	DC-9	Sediment Pond
DA-10	DD-7	Sediment Pond
DA-11	DD-7	Sediment Pond
DA-12	DD-8	Sediment Pond
DA-13	DD-9	Sediment Pond
DA-14a	DD-10	Sediment Pond
DA-14b	DD-15	Sediment Pond
DA-15	DD-11a	Sediment Pond
DA-15b	DD-11b	Sediment Pond
DA-16a	DD-12b	Sediment Pond
DA-16b	DD-12a	Sediment Pond
DA-16c	DD-12c	Sediment Pond
DA-18	DD-17	Sediment Pond
DA-19	DD-18	Sediment Pond
DA-20	DD-21	Sediment Pond
DA-21a	DD-14a	Sediment Pond
DA-21b	DD-14a	Sediment Pond
DA-22	DD-22	Sediment Pond
Fan Portal	ASCA Area	Right Fork Lila Canyon
TS-1	Topsoil Berm	Sediment Pond
POND 1	Sediment Pond	Sediment Pond
POND 2	Sediment Pond	Sediment Pond

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JAN 25 2018

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TABLE 3

Watershed Parameters					
Watershed	Area (Acre)	Hydraulic Length (ft.)	Elevation Change (ft.)	% Slope	CN
Undisturbed Watersheds					
UA-1	258.29	9475	2020	21.32	75
UA-2	1.63	1360	1000	74.26	83
UA-3	2.40	660	410	62.12	83
UA-4	14.08	1950	595	30.51	83
UA-5a	Removed				
UA-5b	Removed				
UA-6a	0.54	230	80	34.78	83
UA-6b	0.46	90	30	33.33	83
UA-7	0.90	100	30	30.00	75
UA-8	0.17	160	16	10.00	75
Disturbed Watersheds					
DA-1	1.25	650	79	12.15	90
DA-2	0.30	380	47	12.37	90
DA-3	0.25	240	10	4.17	90
DA-4	0.38	275	51	14.55	90
DA-5	2.87	580	103	17.93	90
DA-6a	0.12	155	26	16.77	90
DA-6b	0.74	220	28	25.91	90
DA-6c	0.81	410	61	14.88	90
DA-7	0.22	170	33	19.41	90
DA-8	0.41	400	50	12.50	90
DA-9	0.30	290	32	11.03	90
DA-10	0.13	250	35	14.00	90
DA-11	0.25	230	20	8.70	90
DA-12	4.38	875	85	9.71	90
DA-13a	Removed				
DA-13	1.49	490	40	9.18	90
DA-14a	0.59	630	43	6.83	90
DA-14b	0.51	490	43	8.57	90
DA-15a	1.15	497	77	15.49	90
DA-15b	3.50	885	72	8.14	90
DA-16	Removed				
DA-16a	0.20	251	19	15.54	90
DA-16b	0.26	275	48	14.18	90
DA-16c	0.54	221	38	13.57	90

TABLE 3 (Continued)

Watershed Parameters					
Watershed	Area (Acre)	Hydraulic Length (ft.)	Elevation Change (ft.)	% Slope	CN
DA-20	0.49	410	38	9.27	90
DA-21a	1.12	385	55	14.29	90
DA-21b	0.18	120	61	50.83	90
DA-21c	1.91	758	61	8.05	90
DA-23a	11.65	2155	1187	55.08	75
TS-01	1.87	310	53	17.10	75
POND 1	1.92	815	30	3.68	100
Disturbed Watersheds					
DA-17	1.12	240	11	4.58	90
DA-18	0.48	490	37	7.55	90
DA-19	0.55	764	63	8.25	90
DA-22	0.79	610	28	4.59	90
Fan Portal	0.60	195	25	12.82	90
POND 2	0.47				100

TABLE 4

Runoff Summary Undisturbed Watersheds (Not Draining to Ponds)					
Watershed	10 yr. / 6 hr. Peak Flow - cfs	25 yr. / 6 hr. Peak Flow - cfs	100 yr. / 6 hr. Peak Flow - cfs	10 yr. / 24 hr. Peak Flow - cfs	10 yr. / 24 hr. Volume - ac.ft.
UA-1	7.99	13.69	30.52	35.07	7.17
UA-7	0.05	0.12	0.29	0.36	0.03
UA-8	0.01	0.02	0.05	0.07	0.01

TABLE 5

Runoff Summary Watershed Drainage to Sediment Pond				
Watershed	10 yr. / 6 hr. Peak Flow-cfs	25 yr. / 6 hr. Peak Flow-cfs	10 yr. / 24 hr. Peak Flow-cfs	10 yr. / 24 hr. Volume-ac-ft
Undisturbed Watersheds draining to Pond #1				
UA-2	0.40	0.58	1.12	0.09
UA-3	0.62	0.89	1.70	0.13
UA-4	3.00	4.48	9.00	0.74
UA-5a	Removed			
UA-5b	Removed			
UA-6a	0.14	0.20	0.39	0.03
UA-6b	0.12	0.18	0.33	0.02
Disturbed Watersheds				
DA-1	0.64	0.82	1.29	0.11
DA-2	0.16	0.20	0.32	0.03
DA-3	0.13	0.17	0.26	0.02
DA-4	0.20	0.26	0.40	0.03
DA-5	1.48	1.90	3.00	0.24
DA-6a	0.06	0.08	0.13	0.01
DA-6b	0.39	0.50	0.78	0.06
DA-6c	0.42	0.54	0.85	0.07
DA-7	0.12	0.15	0.23	0.02
DA-8	0.21	0.27	0.43	0.03
DA-9	0.16	0.20	0.32	0.03
DA-10	0.07	0.09	0.14	0.01
DA-11	0.13	0.17	0.26	0.02
DA-12	2.16	2.79	4.46	0.37
DA-13a	Removed			
DA-13b	Removed			
DA-13	0.76	0.98	1.54	0.13
DA-14a	0.29	0.38	0.60	0.05
DA-14b	0.26	0.34	0.53	0.04
DA-15a	0.79	1.02	1.60	0.10
DA-15b	1.56	2.01	3.20	0.29
DA-16	Removed			
DA-16a	0.10	0.13	0.21	0.02
DA-16b	0.14	0.18	0.27	0.02
DA-16c	0.29	0.37	0.57	0.05
DA-20	0.25	0.32	0.51	0.04
DA-21a	0.58	0.75	1.17	0.09
DA-21b	0.10	0.12	0.19	0.02
DA-21c	0.94	1.22	1.95	0.16
DA-23a	0.36	1.24	1.68	0.32

Runoff Summary Watershed Drainage to Sediment Pond				
Watershed	10 yr. / 6 hr. Peak Flow-cfs	25 yr. / 6 hr. Peak Flow-cfs	10 yr. / 24 hr. Peak Flow-cfs	10 yr. / 24 hr. Volume-ac-ft
TS-1	0.96	1.24	1.95	0.05
POND 1				3.73

TABLE 5 (Continued)

Runoff Summary Watershed Drainage to Sediment Pond				
Watershed	10 yr. / 6 hr. Peak Flow-cfs	25 yr. / 6 hr. Peak Flow-cfs	10 yr. / 24 hr. Peak Flow-cfs	10 yr. / 24 hr. Volume-ac-ft
Disturbed Watersheds				
Fan Portal	0.21	0.27	0.40	0.03
DA-17	0.58	0.74	1.17	0.09
DA-18	0.25	0.32	0.50	0.04
DA-19	0.27	0.35	0.56	0.05
DA-22	0.39	0.50	0.80	0.07
POND 2				0.32

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JAN 25 2018

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TABLE 6

Runoff Control Structure Watershed Summary		
Structure	Type	Contributing Watersheds/Structures
UC-1	Culvert	UA-1, Fan Portal, Sediment Pond Overflow (Partially abandoned in Fall of 2016 due to plugging from massive storm event)
UC-1a	Culvert	UA-1, Fan Portal, Sediment Pond Overflow (Replaces abandoned portions of UC-1)
DD-1	Ditch	DA-1, UA-2, UA-3
DC-1	Culvert	DD-1
DD-2	Ditch	DC-1, DA-2, UA-6a, UA-6b
DC-2	Culvert	DD-2
DD-3	Ditch	DA-3
DC-3	Culvert	DD-3
DD-4	Ditch	DA-4, DC-2
DC-4	Culvert	DD-4, DC-3
DD-5a	Ditch	DA-5
DD-5b	Ditch	DD-5a
DD-6a	Ditch	DA-6a
DD-6b	Ditch	DD-6a, DA-6b
DC-5	Culvert	DD-5b, DD-6b
DC-6	Culvert	DC-4, DC-5, DA-6c
DC-7	Culvert	DC-6, DA-7
DC-8	Culvert	DC-7, DA-8
DC-9	Culvert	DC-8, DA-9
DD-7	Ditch	DC-9, DA-10, DA-11
DC-10	Culvert	DD-7
DD-8	Ditch	DC-10, DA-12
DD-21	Ditch	DA-20

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TABLE 6

Runoff Control Structure Watershed Summary		
Structure	Type	Contributing Watersheds/Structures
DC-11	Culvert	DD-8, DD-21
DD-9	Ditch	DC-11, DA-13

TABLE 6

Runoff Control Structure Watershed Summary		
Structure	Type	Contributing Watersheds/Structures
DC-12a	Culvert	DD-9
DC-12b	Culvert	DC-12a
DC-12c	Culvert	DC-12b
DC-12d	Culvert	DC-12c
DD-10	Ditch	DA-14a
DD-15	Ditch	DA-14b
DD-11a	Ditch	DA-15a, DA-23a
DD-11b	Ditch	DA-15b
DC-13	Culvert	<i>Removed</i>
DD-12a	Ditch	DC-13, DD-11b, DA-16b
DD-12b	Ditch	DA-16a
DD-12c	Ditch	DD-12a, DD-12b, DA-16c
DD-13	Ditch	DA-21c
DC-14	Culvert	DD-12c
DD-14a	Ditch	DC-14, DA-21a, DA-21b
DD-14b	Ditch	DD-13, DD-14a
DD-16	Ditch	DC-12d, DD-10, DD-15
DD-17	Ditch	DA-18
DD-18	Ditch	DA-19
DD-22	Ditch	DA-22
DC-15	Culvert	DD-18
DC-16	Culvert	DC-15, DD-17
DC-17	Culvert	DA-17
DC-18	Culvert	DD-22

INCORPORATED

JAN 25 2008

TABLE 7

Runoff Control Structure Flow Summary				
Structure	Type	10yr. / 6hr. Peak Flow-cfs	10yr. / 24hr. Peak Flow-cfs	100yr. / 6hr. Peak Flow-cfs
UC-1*	Culvert	33.07	60.15	55.60
UC-1a*	Culvert	33.07	60.15	55.60
DD-1	Ditch	1.66	4.11	--
DC-1	Culvert	1.66	4.11	--
DD-2	Ditch	2.08	5.15	--
DC-2	Culvert	2.08	5.15	--
DD-3	Ditch	0.13	0.26	--
DC-3	Culvert	0.13	0.26	--
DD-4	Ditch	2.28	5.55	--
DC-4	Culvert	2.41	5.81	--
DD-5a	Ditch	1.48	3.00	--
DD-5b	Ditch	1.48	3.00	--
DD-6a	Ditch	0.06	0.13	--
DD-6b	Ditch	0.45	0.91	--
DC-5	Culvert	1.93	3.91	--
DC-6	Culvert	4.76	10.57	--
DC-7	Culvert	4.88	10.80	--
DC-8	Culvert	5.09	11.23	--
DC-9	Culvert	5.25	11.55	--
DD-7	Ditch	5.45	11.95	--
DC-10	Culvert	5.45	11.95	--
DD-8	Ditch	7.61	16.41	--
DD-21	Ditch	0.25	0.51	--
DC-11	Culvert	7.86	16.92	--
DD-9	Ditch	8.62	18.46	--

TABLE 7

Runoff Control Structure Flow Summary				
Structure	Type	10yr. / 6hr. Peak Flow-cfs	10yr. / 24hr. Peak Flow-cfs	100yr. / 6hr. Peak Flow-cfs
DC-12a	Culvert	8.62	18.46	--
DC-12b	Culvert	8.62	18.46	--
DC-12c	Culvert	8.62	18.46	--
DC-12d	Culvert	8.62	18.46	--
DD-10	Ditch	0.29	0.60	--
DD-11a	Ditch	2.75	1.60	--
DC-13	Culvert	N/A	N/A	N/A
DD-11b	Ditch	1.56	3.20	--
DD-12a	Ditch	4.45	10.36	--
DD-12b	Ditch	0.10	0.21	--
DD-12c	Ditch	4.84	11.14	--
DC-14	Culvert	4.84	11.14	--
DD-14a	Ditch	5.52	12.50	--
DD-13	Ditch	0.94	1.95	--
DD-14b	Ditch	6.46	14.45	--
DD-15	Ditch	0.26	0.53	--
DD-16	Ditch	9.17	19.59	INCORPORATED
DD-17	Ditch	0.25	0.50	--
DD-18	Ditch	0.27	0.56	JAN. 25 2008
DA-22	Ditch	0.39	0.80	Div. of Oil, Gas & Mining
DC-15	Culvert	0.27	0.56	--
DC-16	Culvert	0.52	1.06	--
DC-17	Culvert	0.58	1.17	--
DC-18	Culvert	0.39	0.80	--

* UC-1 and UC-1a flow values includes sum of 25yr-6hr peak flows for UA-1 13.69 cfs from Table 4 and 25yr-6hr Sediment Pond 1 peak flow of 26.33 cfs & Fan Portal flow from Table 5- 0.27cfs.

TABLE 8						
Disturbed Ditch Design Summary						
Ditch	DD-1	DD-2	DD-3	DD-4	DD-5a	DD-5b
Slope (%)	13.01	11.98	1.11	11.76	3.33	55.45
Length (ft.)	607	334	180	170	390	110
Manning's No.	0.035	0.035	0.03	0.035	0.03	0.04
Side Slope (H:V)	3:1	3:1	2:1	2:1	2:1	2:1
*Bottom Width (ft.)	2.00	2.00	0.00	2.00	2.00	2.00
Peak Flow 10/6 (cfs)	1.66	2.08	0.13	2.28	1.48	1.48
Peak Flow 10/24 (cfs)	4.11	5.15	0.26	5.55	3.00	3.00
Flow Depth (ft.) 10/6	0.17	0.19	0.24	0.21	0.21	0.11
Flow Depth (ft.) 10/24	0.27	0.31	0.31	0.35	0.32	0.17
Flow Area (ft. ²) 10/6	0.41	0.49	0.11	0.51	0.52	0.25
Flow Area (ft. ²) 10/24	0.77	0.93	0.19	0.93	0.84	0.40
Velocity (fps) 10/6	4.03	4.22	1.17	4.52	2.86	5.93
Velocity (fps) 10/24	5.35	5.55	1.39	5.96	3.55	7.58
Rip-Rap Req'd (Y/N)	N	N	N	N	N	Y
Rip-Rap D ₅₀	-	-	-	-	-	3"

Note: Slope/Lengths from Plate 7-2.

TABLE 8 (Continued)

Disturbed Ditch Design Summary							
Ditch	DD-6a	DD-6b	DD-7	DD-8	DD-9	DD-10	DD-11a
Slope (%)	11.76	5.38	8.11	2.22	2.31	7.46	7.31
Length (ft.)	170	130	148	142	190	630	210
Manning's No.	0.030	0.030	0.035	0.030	0.035	0.030	0.035
Side Slope (H:V)	2:1	2:1	2:1	2:1	2:1	2:1	2:1
*Bottom Width (ft.)	0.00	0.00	2.00	2.00	2.00	0.00	0.00
Peak Flow 10/6 (cfs)	0.06	0.45	5.45	7.61	8.62	0.29	2.70
Peak Flow 10/24 (cfs)	0.13	0.91	11.95	16.41	18.46	0.60	4.83
Flow Depth (ft.) 10/6	0.11	0.28	0.38	0.59	0.68	0.22	0.55
Flow Depth (ft.) 10/24	0.15	0.36	0.58	0.88	0.99	0.29	0.68
Flow Area (ft. ²) 10/6	0.03	0.16	1.05	1.88	2.27	0.10	0.60
Flow Area (ft. ²) 10/24	0.05	0.27	1.83	3.29	3.96	0.17	0.93
Velocity (fps) 10/6	2.33	2.87	5.21	4.04	3.80	2.91	4.50
Velocity (fps) 10/24	2.83	3.43	6.55	4.99	4.67	3.49	5.20
Rip-Rap Req'd (Y/N)	N	N	Y	N	N	N	N
Rip-Rap D ₅₀	-	-	3"	-	-	-	-
Note: Slope/Lengths from Plate 7-2.							

TABLE 8 (Continued)

Disturbed Ditch Design Summary							
Ditch	DD-11b	DD-12a	DD-12b	DD-12c	DD-13	DD-14a	DD-14b
Slope (%)	0.93	15.32	14.29	11.05	9.05	3.24	7.88
Length (ft.)	540	235	70	190	475	340	140
Manning's No.	0.030	0.035	0.030	0.035	0.030	0.035	0.035
Side Slope (H:V)	2:1	2:1	2:1	2:1	2:1	2:1	2:1
*Bottom Width (ft.)	2.00	2.0	0.0	2.0	2.0	2.0	2.0
Peak Flow 10/6 (cfs)	1.56	4.40	0.10	4.79	0.94	5.47	6.41
Peak Flow 10/24 (cfs)	3.20	8.30	0.21	9.08	1.95	10.44	12.39
Flow Depth (ft.) 10/6	0.32	0.28	0.13	0.32	0.12	0.49	0.42
Flow Depth (ft.) 10/24	0.47	0.40	0.18	0.46	0.19	0.68	0.59
Flow Area (ft. ²) 10/6	0.83	0.72	0.04	0.86	0.28	1.45	1.18
Flow Area (ft. ²) 10/24	1.38	1.12	0.06	1.34	0.45	2.31	1.89
Velocity (fps) 10/6	1.87	6.09	2.85	5.58	3.39	3.77	5.42
Velocity (fps) 10/24	2.31	7.39	3.43	6.75	4.36	4.52	6.54
Rip-Rap Req'd (Y/N)	N	Y	N	Y	N	N	Y
Rip-Rap D ₅₀	-	3"	-	3"	-	-	3"
Note: Slope/Lengths from Plate 7-2.							

TABLE 8 (Continued)

Disturbed Ditch Design Summary							
Ditch	DD-15	DD-16	DD-17	DD-18	DD-21	DD-22	
Slope (%)	6.94	1.52	8.43	7.75	8.61	5.00	
Length (ft.)	490	260	415	710	360	480	
Manning's No.	0.030	0.030	0.030	0.030	0.030	0.030	
Side Slope (H:V)	2:1	2:1	2:1	2:1	2:1	2:1	
*Bottom Width (ft.)	0.0	4.0	0.0	0.0	0.0	0.0	
Peak Flow 10/6 (cfs)	0.26	9.17	0.25	0.27	0.25	0.39	
Peak Flow 10/24 (cfs)	0.53	19.59	0.50	0.56	0.51	0.80	
Flow Depth (ft.) 10/6	0.22	0.53	0.21	0.22	0.21	0.27	
Flow Depth (ft.) 10/24	0.28	0.81	0.27	0.28	0.27	0.35	
Flow Area (ft. ²) 10/6	0.09	2.68	0.09	0.09	0.08	0.14	
Flow Area (ft. ²) 10/24	0.16	4.53	0.14	0.16	0.14	0.25	
Velocity (fps) 10/6	2.76	3.42	2.94	2.90	2.96	2.70	
Velocity (fps) 10/24	3.29	4.32	3.49	3.48	3.54	3.23	
Rip-Rap Req'd (Y/N)	N	N	N	N	N	N	
Rip-Rap D ₅₀	-	-	-	-	-	-	
Note: Slope/Lengths from Plate 7-2.							

TABLE 9

Disturbed Culvert Design Summary						
Culvert	DC-1	DC-2	DC-3	DC-4	DC-5	DC-6
Slope (%)	27.78	10.00	53.85	9.81	4.71	28.04
Length (ft.)	72	60	65	400	350	107
Manning's No.	0.024	0.024	0.024	0.024	0.024	0.024
Peak Flow 10/6 (cfs)	1.66	2.08	0.13	2.41	1.93	4.76
Peak Flow 10/24 (cfs)	2.85	3.37	0.21	5.81	3.91	10.57
Diam. Proposed (ft.)	1.5	1.5	1.5	2.0	2.0	2.0
Velocity (fps) 10/6	6.72	6.79	5.32	6.20	4.93	12.06
Rip-Rap D ₅₀	3"	3"	3"	3"	-*	-*
Note: Slope/Lengths from Plate 7-5. Velocity: (Hydraulic Toolbox Program)						

* Discharge is into manhole - no riprap needed

TABLE 9 (Continued)

Disturbed Culvert Design Summary						
Culvert	DC-7	DC-8	DC-9	DC-10	DC-11	DC-12a
Slope (%)	7.74	5.99	5.91	2.27	4.95	0.48
Length (ft.)	155	167	186	60	101	140
Manning's No.	0.024	0.024	0.024	0.024	0.024	0.015
Peak Flow 10/6 (cfs)	4.88	5.09	5.25	5.45	7.86	8.62
Peak Flow 10/24 (cfs)	10.80	11.23	11.55	11.95	16.25	18.46
Diam. Proposed (ft.)	2.0	2.0	2.0	2.0	2.0	2.0
Velocity (fps) 10/6	7.70	7.11	7.14	5.11	7.5	4.64
Rip-Rap D ₅₀	-*	-*	3"	3"	3"	-*
Note: Slope/Lengths from Plate 7-5. Velocity: (Hydraulic Toolbox Program)						

* Discharge is into manhole - no riprap needed

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TABLE 9 (Continued)

Disturbed Culvert Design Summary						
Culvert	DC-12b**	DC-12c**	DC-12d	DC-13	DC-14	DC-15
Slope (%)	1.55	2.46	-0.12	N/A	5.00	2.22
Length (ft.)	79	357	9	N/A	40	45
Manning's No.	0.015	0.015	0.015	N/A	0.024	0.024
Peak Flow 10/6 (cfs)	8.62	8.62	8.62	N/A	4.84	0.27
Peak Flow 10/24 (cfs)	18.46	18.46	18.46	N/A	11.14	0.56
Diam. Proposed (ft.)	2.0	2.0	2.0	N/A	2.0	1.50
Velocity (fps) 10/6	7.10	8.40	4.03	N/A	6.71	2.72
Rip-Rap D ₅₀	-	-	-	-	3"	-
Note: Slope/Lengths from Plate 7-5. Velocity: (Hydraulic Toolbox Program)						

** Discharge is into a manhole - no riprap required

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TABLE 9 (Continued)

Disturbed Culvert Design Summary						
Culvert	DC-16	DC-17	DC-18	SP2-1*		
Slope (%)	11.20	5.00	3.73	0.50		
Length (ft.)	25	120	27	165		
Manning's No.	0.024	0.024	0.024	0.024		
Peak Flow 10/6 (cfs)	0.52	0.58	0.39	-		
Peak Flow 10/24 (cfs)	1.06	1.17	0.80	2.72*		
Diam. Proposed (ft.)	1.50	1.50	1.50	1.50		
Velocity (fps) 10/6	5.80	2.93	2.93	2.45		
Rip-Rap D ₅₀	3"	-	-	-		
Note: Slope/Lengths from Plate 7-5. Velocity: (Hydraulic Toolbox Program)						

* SP2-1 Peak Flow is a 25/6 event

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TABLE 10

Undisturbed Culvert Design Summary		
Culvert	UC-1	UC-1a
Min. Slope (%)**	0.50	0.50
Length (ft.)	120	360
Manning's No.	0.025	0.025
Peak Flow 10/6 (cfs)*	33.07	33.07
Peak Flow 100/6 (cfs)*	55.60	55.60
Diam. Proposed (ft.)	5.00	5.00
Velocity (fps) 100/6	5.22	5.22
<p>* Note: Peak flow values include 25 year-6 hour flow from Sediment Pond 1 (see Tables 4 and 7). ** Pipe slope from Plate 7-6a. ***Note: A large portion of culvert UC-1 was abandoned and replaced with UC-1a in the fall of 2016. See Part (a) of Section (b) on Page 1 regarding changes to UC-1.</p>		

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References:

Hawkins, R.H. and K.A. Marshall. 1979. Storm Hydrograph Program. Final Report to the Utah Division of Oil, Gas and Mining. Utah State University. Logan, Utah.

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DESIGN OF SEDIMENT CONTROL STRUCTURES

Design Specifications:

- 3.1 Design and Construction Specifications for Sedimentation Pond
- 3.2 Sediment Yield
- 3.3 Sediment Pond Volume
- 3.4 Sediment Pond Summary

Tables:

Table 11	Sediment Pond Design
Table 12a	Sediment Pond #1 - Stage Volume Data
Table 12b	Sediment Pond #2 - Stage Volume Data
Table 13a	Sediment Pond #1 - Stage Discharge Data
Table 13b	Sediment Pond #2 - Stage Discharge Data

Figures:

Figure 5.4	Depth of 2-year, 6-hour rainfall - Barfield et al.
Figure 5.15	Slope-effect Chart - Barfield et al.

3.1 Design and Construction Specifications for Sedimentation Pond

- All construction of sedimentation ponds will be performed under the direction of a qualified, registered professional engineer.
- The Sediment Pond #1 will be located in an existing low area where the Right Fork of Lila Canyon passes beneath the existing road. The existing road fill and culvert will be removed, and the pond embankment (road fill) will be reconstructed and compacted. The existing culvert will be replaced with UC-1/UC-1a which will extend approximately 400' up the Right Fork of Lila Canyon. This culvert will be equipped with an inlet section and trash rack, and will allow undisturbed runoff and treated access road drainage to pass beneath the sediment pond. The majority of the pond will be in an existing channel area, and is therefore considered incised. The pond will be equipped with a culvert riser principal spillway with an oil skimmer, a decant, and a second culvert riser emergency spillway with an oil skimmer. Both spillways will discharge to the oversized (60") CMP culvert running beneath the pond.
- The area of pond constructed shall be examined for topsoil, and where present in removable quantities, such soil shall be removed separately and stored in an approved topsoil storage location.
- In areas where fill is to be placed for the pond impoundment structures, natural ground shall be removed to at least 12" below the base of the structure.
- Native materials shall be used where practical. Fill will be placed in lifts not to exceed 6" and compacted prior to placement of next lift. Compaction of all fill materials shall be at least 95%.
- Rip-rap or other protection (culverts, concrete, etc.) will be placed at all pond inlets to prevent scouring. Rip-rap will consist of substantial, angular (non-slaking) rock material of adequate size.
- Decanting of the pond, as required, will be accomplished by use of a decant pipe with an inverted inlet as shown on Plate 7-6a. Samples will be collected prior to decanting of the pond. If the quality of the water meets the requirements of the U.P.D.E.S. Permit, decanting will proceed. Discharge samples will be collected as per the approved U.P.D.E.S. Discharge Permit.
- Slopes of the embankments shall not be steeper than 2h:1v, inside or outside, with a total of the inslope and outslope not less than 5h:1v, except where areas of the pond are incised.
- External slopes of the impoundment will be planted with an approved seed mix to help prevent erosion and promote stability.
- Top width of the embankment shall be not less than $(H+35)/5$, where H = Height of Dam in feet from the upstream toe.

3.2 Sediment Yield

The Universal Soil Equation (USLE) was used to estimate sediment yield from disturbed areas. All soil loss from this area was assumed to be delivered to, and deposited in the sedimentation pond.

Erosion rate (A) in tons-per-acre-per-year is determined using the USLE as follows:

$$A = (R) (K) (LS) (CP)$$

Where the variables R, K, LS, and CP are defined as follows:

Variable "R" is the rainfall factor which can be estimated from $R = 27P^{2.2}$, where P is the 2-year, 6-hour precipitation value. P for the Lila Canyon area is 0.75" as shown in Figure 5.4, page 315, Barfield, et.al. 1983. Therefore, the estimated value of "R" for this area is 14.34.

Variable "K" is the soil erodibility factor. For disturbed areas, the "K" value is conservatively estimated to be 0.5. For disturbed runoff, but uncompacted and ungraded areas, "K" is estimated at 0.320. "K" is estimated to be 0.035 for undisturbed areas.

Variable "LS" is the length-slope factor. This figure was determined by applying the slope length and percentage for each sub-drainage area to the chart in Figure 5.15, p. 334, "Applied Hydrology and Sedimentology for Disturbed Areas", Barfield, Warner and Haan, 1983.

Variable "CP" is the control practice factor, which can be divided into a cover and practice factor. Values were determined from Appendix 5A, Barfield, et.al., 1983.

Site	CP Factor
Compacted Areas	1.20
Disturbed/Uncompacted Areas	0.20
Undisturbed Areas	0.15

The sediment volume is based on a density of 100 pounds per cubic foot of sediment.

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SEDIMENT YIELD CALCULATIONS - USLE - Drainages to Sediment Ponds

Drainage	R	K	Area (ac)	Slope Length (Ft)	Slope (%)	LS	CP	A (T/ac)	Yield (ac-ft)
Draining to Sediment Pond 1									
DA-1	14.34	0.500	1.25	650	12.15	4.67	1.20	40.14	0.0230
DA-2	14.34	0.500	0.30	380	12.37	3.67	1.20	31.55	0.0043
DA-3	14.34	0.500	0.25	240	4.17	0.59	1.20	5.10	0.0006
DA-4	14.34	0.500	0.38	275	18.55	5.95	1.20	51.20	0.0089
DA-5	14.34	0.500	2.87	580	17.76	8.05	1.20	69.26	0.0913
DA-6a	14.34	0.500	0.12	155	16.77	3.79	1.20	32.63	0.0018
DA-6b	14.34	0.500	0.74	220	12.73	2.92	1.20	25.10	0.0085
DA-6c	14.34	0.500	0.81	410	14.88	5.09	1.20	43.81	0.0163
DA-7	14.34	0.500	0.22	170	19.41	5.04	1.20	43.35	0.0044
DA-8	14.34	0.500	0.41	400	12.50	3.82	1.20	32.90	0.0062
DA-9	14.34	0.500	0.30	290	11.03	2.69	1.20	23.14	0.0032
DA-10	14.34	0.500	0.13	250	14.00	3.61	1.20	31.06	0.0019
DA-11	14.34	0.500	0.25	230	8.70	1.68	1.20	14.50	0.0017
DA-12	14.34	0.500	4.38	875	9.71	3.86	1.20	33.22	0.0668
DA-13a	Remo								
DA-13b	Remo								
DA-13	14.34	0.500	1.49	490	8.16	2.25	1.20	19.33	0.0132
DA-14a	14.34	0.500	0.59	630	6.83	1.99	1.20	17.13	0.0046
DA-14b	14.34	0.500	0.51	490	8.78	2.49	1.20	21.46	0.0050
DA-15a	14.34	0.500	1.55	497	15.49	5.98	1.20	51.43	0.0272
DA-15b	14.34	0.500	3.50	885	8.02	2.95	1.20	25.35	0.0407
DA-16	Remo								
DA-16a	14.34	0.500	0.20	251	15.54	4.27	1.20	36.74	0.0034
DA-16b	14.34	0.500	0.26	275	14.18	3.86	1.20	33.24	0.0040
DA-16c	14.34	0.500	0.54	221	13.57	3.23	1.20	27.80	0.0069
DA-20	14.34	0.500	0.49	410	8.54	2.19	1.20	18.86	0.0042
DA-21a	14.34	0.500	1.12	385	14.03	4.49	1.20	38.67	0.0199
DA-21b	14.34	0.500	0.18	120	8.33	1.14	1.20	9.85	0.0008
DA-21c	14.34	0.500	1.91	758	5.54	1.66	1.20	14.33	0.0126
UA-2	14.34	0.500	1.63	1360	73.53	110.75	0.15	119.11	0.0891
UA-3	14.34	0.500	2.40	540	75.93	72.56	0.15	78.04	0.0860
UA-4	14.34	0.500	14.08	1540	38.64	46.77	0.15	50.30	0.3252
UA-5a	Remo								
UA-5b	Remo								
UA-6a	14.34	0.500	0.54	370	21.62	8.87	0.15	9.54	0.0024
UA-6b	14.34	0.500	0.46	130	23.08	5.86	0.15	6.3	0.0013
TS-01*	14.34	0.500	1.87	660	17.10	8.08	0.20	11.58	0.0099
POND 1	14.34	0.500	1.92	340	3.68	0.59	1.20	5.11	0.0045
TOTAL									0.8998

Draining to Sediment Pond 2									
DA-17	14.34	0.500	1.12	240	4.58	0.66	1.20	5.68	0.0029
DA-18	14.34	0.500	0.48	490	7.55	2.02	1.20	17.34	0.0038
DA-19	14.34	0.500	0.55	764	8.25	2.85	1.20	24.51	0.0062
DA-22	14.34	0.500	0.79	610	4.59	0.96	1.20	8.26	0.0030
POND 2	14.34	0.500	0.47	45	12.82	1.33	1.20	11.48	0.0025
TOTAL									0.0184

* Disturbed Runoff / Uncompacted Area

** Paved Areas

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3.3 Sediment Pond Volume

The volumes shown in Tables 11a and 11b are from the volumes calculated from the precipitation, runoff and sediment yield for a 10 year-24 hour precipitation event. The volumes were calculated based on the disturbed areas (and contributing undisturbed areas) runoff values, developed using the design parameters described in this section.

TABLE 11a

Sediment Pond #1 Design	
1. Use 1.90" for 10 year - 24 hour event.	
2. Runoff Volume - (3.34 ac-ft, from Table 5, 10yr/24hr Vol) =	3.38 ac-ft
3. Sediment Storage Volume USLE 0.8998 ac-ft./yr. x 3.0 yrs. =	2.70 ac-ft
4. Total Required Pond Volume 3.38 + 2.70 =	6.08 ac-ft
5. Peak Flow (25 yr. - 6 hr. event) =	24.81 cfs
6. Pond Design Volume @ Principle Spillway = (See Table 12a)	13.04 ac-ft
7. Mine water storage ⁽¹⁾	6.96 ac-ft

⁽¹⁾ difference in storage between the top of the require storm water storage and the spillway elevation

TABLE 12a

Sediment Pond #1 Stage/Volume Data				
Elevation	Area (sq. ft.)	Volume (cu. ft.)	Acc. Volume (ac. ft.)	Remarks
5839	26870	0	0.00	Bottom of Pond
5830	28640	27755	0.64	
5831	30480	29560	1.32	Sediment Storage - 2.70 ac-ft
5842	32320	31400	2.04	
5843	34210	33265	2.80	Sediment Cleanout Level 5843.6
5844	36140	35175	3.61	Decant 5844.6 - 4.21 ac-ft
5845	38110	37125	4.46	Runoff Storage - 3.38 ac-ft
5846	40120	39115	5.36	
5847	42160	41140	6.30	Runoff + Sed Storage - 6.08 ac-ft
5848	44260	43210	7.29	
5849	46390	45325	8.33	
5850	48550	47470	9.42	Mine Water Storage - 6.96 ac-ft
5851	50970	49760	10.57	
5852	53490	52230	11.77	
5853	55010	54250	13.01	Principal Spillway - 5853
5854	56590	55800	14.29	Emergency Spillway - 5854
5855	58380	57485	15.61	Top of Embankment

TABLE 11b

Sediment Pond #2 Design	
1. Use 1.90" for 10 year - 24 hour event.	
2. Runoff Volume - (from Table 5, 10yr/24hr) =	0.32 ac-ft.
3. Sediment Storage Volume USLE 0.0184 ac-ft./yr. x 3 yrs. =	0.06 ac-ft
4. Total Required Pond Volume 0.32 + 0.06 =	0.38 ac-ft
5. Peak Flow (25 yr. - 6 hr. event)* =	1.41 cfs
6. Pond Design Volume @ Principle Spillway = (See Table 12b)	1.36 ac-ft
* Peak Flow values from Table 5, sum of all contributing watersheds.	

TABLE 12b

Sediment Pond #2 Stage/Volume Data				
Elevation	Area (sq. ft.)	Volume (cu. ft.)	Acc. Volume (ac. ft.)	Remarks
5845	0	0	0	Bottom of Pond 5845.0
5846	312	156	0.00	
5847	6935	3623.5	0.08	Sediment Cleanout Level 5847.0
5848	8045	7490	0.26	Decant 5847.9
5849	8650	8348	0.45	
5850	9270	8960	0.65	Principal Spillway 5849.61
5851	9910	9590	0.87	
5852	10560	10235	1.11	Emergency Spillway 5851.25
5853	11230	10895	1.36	
5854	11920	11575	1.62	
5855	12890	12406	1.91	
5855.5	14120	6753	2.06	Top of Embankment

TABLE 13a

Sediment Pond #1 Stage/Discharge Data			
Head above Spillway(ft.)	Q (cfs) Weir Controlled	Q (cfs) Orifice Controlled	Q (cfs) Pipe Flow Controlled
0.0	-	-	-
0.2	2.53	15.22	95.68
0.4	7.15	21.53	96.23
0.6	13.14	26.36	96.77
0.8	20.23	30.44	97.31
1.0	28.27	34.04	97.85
1.2	37.17	37.28	98.38
1.4	46.84	40.27	98.91
1.6	57.22	43.05	98.91
1.8	68.28	45.66	99.44
2.0	79.97	48.13	99.97

Note: 1- 25 year - 6 hour flow = 24.81 cfs.

2- Flow will be weir controlled at a head of 0.91' over riser inlet.

Weir Controlled

$Q = CLH^{1.5}$; where: C= 3.0, L= Circumference of Riser = 9.4248', R=1.5'

Orifice Controlled

$Q = C'a(2gH)^{0.5}$; where: C= 0.6, a= Area of Riser = 7.0686 ft², R=1.5', g= 32.2 ft/sec²

Pipe Flow Controlled

$Q = \frac{a(2gH')^{0.5}}{(1+K_e+K_b+K_cL)^{0.5}}$; where

- a = Area of Pipe = 7.07 ft², R = 1.5'
- H' = Head = H + 14.5 (Riser) + 0.35 (Slope) + 0.6*4 (barrel height)
- K_e = 1.0
- K_b = 0.5
- K_c = 0.043
- L = 70'

TABLE 13b

Sediment Pond #2 Stage/Discharge Data			
Head above Spillway (ft.)	Q (cfs) Weir Controlled	Q (cfs) Orifice Controlled	Q (cfs) Pipe Flow Controlled
0.0	-	-	-
0.2	0.84	1.69	5.81
0.4	2.38	2.39	5.88
0.6	4.38	2.93	5.95
0.8	6.74	3.38	6.02
1.0	9.42	3.78	6.09
1.2	12.39	4.14	6.16
1.4	15.61	4.47	6.22
1.6	19.07	4.78	6.29
1.8	22.76	5.07	6.36
2.0	26.66	5.35	6.42

Note: 1- 25 year - 6 hour flow = 1.41 cfs.

2- Flow will be Weir controlled at a head of 0.36' over riser inlet.

Weir Controlled

$Q = CLH^{1.5}$; where: $C = 3.0$, $L =$ Circumference of Riser = 3.14', $R = 0.5'$

Orifice Controlled

$Q = C'a(2gH)^{0.5}$; where: $C = 0.6$, $a =$ Area of Riser = 0.79 ft², $R = 0.5'$, $g = 32.2$ ft/sec²

Pipe Flow Controlled

$Q = \frac{a(2gH')^{0.5}}{(1+K_e+K_b+K_cL)^{0.5}}$; where

- $a =$ Area of Pipe = 0.79 ft², $R = 0.5'$
- $H' =$ Head = $H + 6.0$ (Riser) + 0.8 (Slope) + 0.6*2 (barrel height)
- $K_e = 1.0$
- $K_b = 0.5$
- $K_c = 0.043$
- $L = 160'$

3.4 Sediment Pond Summary

- a) The sedimentation ponds have been designed to contain the disturbed area (and contributing undisturbed area) runoff from a 10 year-24 hour precipitation event, along with multiple years of sediment storage capacity. Runoff to the ponds will be directed by various ditches and culverts as described in the plan.
- b) The required volume for Sediment Pond #1 is calculated at 6.08 acre feet, including 3.0 years of sediment storage. The proposed sediment pond size will have a volume of approximately 13.04 acre feet (at the principal spillway), which is more than adequate. The extra storage 6.96 acre-foot in Pond 1 will be used for optional mine water handling. The required volume for Sediment Pond #2 is calculated at 0.38 acre feet, including 3 years of sediment storage. The proposed sediment pond size will have a volume of approximately 1.36 acre feet (at the principal spillway), which is more than adequate.
- c) The ponds will meet a theoretical detention time of 24 hours. Both are equipped with a decant, a culvert principal spillway and a culvert emergency spillway. Any discharge from the ponds will be in accordance with the approved UPDES Permit.
- d) The pond inlets will be protected from erosion, and the spillways will discharge into the natural drainages in a controlled manner.
- e) The ponds are temporary, and will be removed upon final reclamation of the property.
- f) The ponds will be constructed according to the regulations and under supervision of a Registered, Professional Engineer.

**DESIGN OF DRAINAGE CONTROL STRUCTURES
FOR
RECLAMATION**

Reclamation Hydrology:

- 4.1 General
- 4.2 Reclamation Area Drainage Control

Tables:

- Table 14 Final Reclamation - Drainage Areas Contributing to Structures
- Table 15 Final Reclamation - Drainage Structure Flow Summary
- Table 16 Final Reclamation - Reclamation Structure Design Parameters
- Table 17 Final Reclamation - Reclamation Structure Flow Calculations

Figures:

- Figures 5 Filter Fence Construction

Reclamation Hydrology

4.1 General

Upon completion of operations at the Lila Canyon Minesite, the portals will be sealed and backfilled, and all structures will be removed except for the sediment ponds, bypass culvert UC-1/UC-1a, reclamation ditches and temporary sediment controls such as silt fences or straw bales.

Any refuse or mine development waste previously deposited under the approved plan will also be left in place. Concrete will be buried beneath at least 2' of non-toxic, non-acid material. Any potentially toxic or acid-forming material buried on site will be covered with a minimum of 4' of material.

The sediment ponds, and all remaining drainage controls will be removed upon completion of Phase II Bond Release.

4.2 Reclamation Area Drainage Control

During the initial phase of reclamation, all drainage controls will be removed with the exception of the two sediment ponds, bypass culvert UC-1/UC-1a, reclaimed ditches RD-1 and RD-2, and temporary sediment controls such as straw bales or silt fences installed in the undisturbed drainages.

As undisturbed drainage culverts are removed, a minimum of two straw bale or silt fence barriers will be installed downstream of each location for sediment control purposes.

Disturbed areas will be regraded and reclaimed ditches RD-1 and RD-2 will be installed to collect the runoff from the site area and direct it to the outlet structures (see Plate 7-7).

When the vegetation and sediment contribution levels meet requirements for Phase II Bond Release, a series of at least three straw bale or silt fence barriers will be placed downstream of the sediment pond outlets. All upstream sediment controls will be removed. Reclaimed ditches RD-1 and RD-2 will also be removed, regraded and reseeded. Culvert UC-1/UC-1a will be cut off at the location of the principal pond spillway.

The portion of culvert UC-1 remaining beneath the road will be left as a permanent drainage control. The culvert will be equipped with an inlet section and rip-rapped headwall. The culvert is adequately sized to safely pass runoff from a 100 year - 6 hour event, as shown in Table 10. To ensure that state of the art technology is incorporated, the final reclamation plans for the sedimentation pond areas will be submitted prior to commencement of final reclamation of this area.

The remainder of culvert UC-1/UC-1a will be removed, and the natural channel restored through the sediment pond #1 area. The sediment pond structures will also be removed, the pond areas regraded as necessary and reseeded. The Sediment Pond #1 embankment will remain as a permanent feature, since the existing (and proposed future) road through the area passes over the embankment.

Following the successful establishment of vegetation, and when effluent standards are met, the sediment ponds will be removed. The same methodologies relative to recontouring, top soil application and seeding will be utilized in grading and revegetating the pond areas as outlined in Chapters 2, 5, and Appendix 5-8.

The pond embankment will be narrowed to facilitate the even character of the Lila Canyon Road. The 60 inch bypass culvert (UC-1) will be removed to within six feet of the road embankment. A newly formed channel will be constructed at an approximate four percent grade to intercept the inlet of the culvert at its intersection of the road. The road embankment and associated new channel will be armored by the Operator

with an underlayment of filter gravel, with D_{50} -30 inch rip-rap. The new area of disturbance including the newly formed channel will have top soil spread in and around the rip-rap. The Operator will use the same seeding and mulching methods described in Appendix 5-8 will be used on this area as well. See Figure 4 for a detailed design.

TABLE 14

Final Reclamation Drainage Areas Contributing to Structures	
Channel	Contributing Watershed/Structure
RD-1	RW-1
RD-2	RW-2
UC-1/UC-1a	UA-1, UA-4, RD-1

TABLE 15

Final Reclamation Drainage Structure Flow Summary	
Channel	*100/6 Flow (cfs)
RD-1	13.26
RD-2	10.89
UC-1/UC-1a	**72.62

* CN = 83.

** Combined flow for watersheds UA-1, UA-4, and RW-2.

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TABLE 16

Final Reclamation Reclamation Structure Design Parameters					
Channel	Bottom Width (ft.)	Side Slope H:V	Slope %	Reclaimed Depth (ft.)	Manning's No.
RD-1	3	2:1	5.00	1.5	0.035
RD-2	3	2:1	10.00	1.5	0.035
UC-1/UC-1a	60" Diam.	-	0.90*	60" Diam.	0.025

* Pipe slope for Plate 7-6

TABLE 17

Final Reclamation Reclamation Structure Flow Calculations			
Channel	RD-1	RD-2	UC-1/UC-1a
100 year - 6 hour event (in.)	1.90	1.90	1.90
Peak Flow (cfs)	13.26	10.89	72.62
Velocity (fps)	5.44	6.52	6.74
Required Area (ft. ²)	2.44	1.67	10.80
Flow Depth (ft.)	0.58	0.43	2.69

Alternate Sediment Control for Fan Site and Topsoil Storage Area

5.1 ASCA Areas

Sediment Control at the slope below water treatment area, and topsoil storage area sites will be accomplished with a combination of one or more of the following: berms, silt fences, and straw bales.

The ventilation breakouts are just punch outs and will have insignificant disturbance associated with them. (Plate 5-2 and 5-2a) However, they are addressed as ASCA's and are addressed here even though there will be only insignificant surface disturbance. The ASCA's will be seeded upon final reclamation.

The topsoil collected from the topsoil storage area sites will be located downslope from the sites and will be used in the construction of the berm. The berm will be constructed a minimum of two feet high and have 2:1 side slopes. The berm will control the flow from a 10 year-24 hour precipitation event. Silt fence will be selectively placed to help control runoff. The berm will be stabilized with vegetation to prevent erosion. As much as practical, the vegetation techniques used on the main topsoil pile will be utilized on the fan topsoil berm.

The outside of the berm will be protected with a silt fence or gravel. The gravel, if used, would help augment the revegetation. Construction details of the silt fence/filter fence are shown in Figure 5.

The outslope of the portal access road, outslope of the water treatment pad, and ventilation break outs will have a silt fence located along the disturbed area boundary to treat the runoff from the slope. While some portions of this area will be disturbed as a result of the fill material placed for the pad and road construction, the major portion of this area is expected to remain undisturbed. As an added protection, the portions of the area that are disturbed by the fill placement will be covered with an erosion control mat to minimize the erosion from this slope and that area seeded to aid in the establishment of a vegetative cover.

Due to lack of final engineering details, the exact location of the berms, silt fences, and subsequent erosion techniques will be determined in the field with the approval of UDOGM. The final determination will be made prior to the start of topsoil removal.

Run-off Calculations**5.2 Ventilation Break Outs**

Insignificant surface disturbance.

5.3 Topsoil Storage Area

Acreage: 2.61 acres
 Design Storm:10 year/24 hour: 1.90"
 CN: 90
 S: 1.111
 $Q = \frac{(P-0.25S)^2}{P+0.8S} = 1.01"$ of runoff

Total run-off = 0.22 acre feet

5.4 Water Treatment Area

Acreage: 0.37 acres
 Design Storm:10 year/24 hour: 1.90"
 CN: 90
 S: 1.111
 $Q = \frac{(P-0.2S)^2}{P+0.8S} = 1.01"$ of runoff

Total run-off = 0.03 acre feet

**Lila Canyon Mine
Watershed Peakflow Calculations**

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**Lila Canyon Mine
Ditch And Culvert Calculations**

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Bonding

Lila Canyon Mine Reclamation Bond Estimate

Bonding Calculations

Direct Costs

Subtotal Demolition and Removal	\$684,359.00
Subtotal Backfilling and Grading	\$452,273.00
Subtotal Revegetation	\$151,618.00

Direct Costs in 2017 Dollars	\$1,288,250.00
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Indirect Costs

Mob/Demob	\$128,825.00	10.0%
Contingency	\$64,413.00	5.0%
Engineering Redesign	\$32,206.00	2.5%
Main Office Expense	\$87,601.00	6.8%
Project Management Fee	\$32,206.00	2.5%

Subtotal Indirect Costs 2017 Dollars	\$345,251.00	26.8%
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Total Cost	\$1,633,501.00
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Escalation factor		0.000
Number of years		5
Escalation	\$0.00	

Total Reclamation Cost 2021 Dollars	\$1,633,501.00
--	-----------------------

Bond Amount (rounded to nearest \$1,000) **\$1,634,000.00**
2021 dollars

Bond Posted **\$1,799,000.00**

Difference Between Posted Bond and Cost Estimate **\$165,000.00**

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Lila Canyon Mine Reclamation Bond Estimate
Unit Costs

All unit costs were obtained from RS Means 2017 Site Work and Landscape Costs or RS Means 2017 Heavy Construction Costs, except as noted. All costs include overhead and profit.

Means Number	Item	Unit Cost	Units	
32 91 13.23 3100	75 HP Dozer with scarifier	5.85	MSF	
32 91 13.16 0390	Power mulcher, large, hay 1" deep	30.50	MSF	
32 01 90.13 0180	Fertilizer, hydro spread, 1.5 lb/MSF	5.00	MSF	
32 82 19.14 4600	Hydroseeder (equipment and labor only)	22.00	MSF	
05 05 05.10 0380	Removal of steel plate, 121-500 lb	68.00	EA.	
02 41 19.27 0020	Touch cutting, steel, 1" thick plate	3.21	LF	
02 41 16.13 0020	Building Demolition - Steel	0.27	CF	Unit cost reduced 30% for no interior walls (see 02 41 16.13 5000)
02 41 16.13 0100	Building Demolition - Mixture of Types	0.40	CF	
13 05 05.50 0650	Pre-engineered steel bldg demo, >12,500 SF	1.68	SF Ft	
02 41 16.17 0280	Concrete Floor Demolition, 4" thick, reinforced	0.89	SF	
02 41 16.17 0420	Concrete Floor Demolition, 6" thick, reinforced	1.11	SF	
02 41 16.17 2500	Concrete Wall/Floor Demo, 12" thick, reinforced	1.57	SF	Unit cost increased 10% for reinforcing (see 02 41 16.17 2600)
31 23 16.42 1300	Front End Loader 3CY	2.21	CY	
31 23 23.20 1014	12 CY (16 Ton) Dump Truck 122 red. Trip	3.74	CY	
02 41 16.17 4200	On Site Disposal	11.40	CY	
Crew B-1	Portal seal, site preparation crew	1484.40	Day	
04 22 10.34 1500	Block wall, reinforced, 4" thick (2 each seal)	8.50	SF	
JennChem	Seal portals, materials	4320.00	EA.	See JennChem bid
JennChem	Seal portals, labor	265.00	HR	
Classic Helicopters	Portal seal support, material haulage	11065.00	Job	
23 05 05.10 3600	Mechanical Equipment Demolition, Heavy	1225.00	Ton	
26 05 05.10 1570	Demo of elec transformer, 3 ph, 750kVA	1760.00	EA.	
Crew A-3H	Hydraulic crane, 12 ton, with operator	1518.58	Day	
G 1030 1100	Cut and fill common earth, 8" lift, 2 passes	7.90	CY	
31 23 16.42 0260	Excavation Bulk Bank 2 CY (322BL)	1.81	CY	
31 23 16.13 3080	Backfill Trench, min haul, FE loader 2 1/4 CY	2.50	CY	
Crew B-10M	Dozer, 300 HP, 50' haul, sandy clay and loam	2978.00	Day	
Crew B-14A	Loader, 500 HP, wheel mounted, 5 CY cap	4306.40	Day	
Crew B-10G	Sheepsfoot roller, 315 HP, 8" lifts, 2 passes	2313.60	Day	
Crew B-33K	Self-propelled scraper, 34 CY, 500 HP	418.20	HR	
Crew B-34F	Off-highway rear dump truck, 40 ton, 10 MPH	2234.80	Day	
Crew B-9A	5000 gallon water truck	2041.01	Day	
02 41 13.60 1700	Chain link removal, 8'-10' high	4.44	LF	
02 41 13.17 5050	Pavement Removal, bituminous, 4" to 6" thick	9.80	SY	
02 41 13.30 1600	Median barrier, precast conc, remove and store	14.00	LF	
Scamp	Demolition debris, off-site haul and disposal	6.00	Ton	See Scamp bid
02 41 13.80 0200	Wood utility poles, 35'-45' high	370.00	EA.	
02 41 13.80 0300	Wood cross arms, 4'-6' long	136.00	EA.	
Crew B-6	Backhoe loader, 2 laborers, equip operator	1960.00	Day	
Crew B-7	Log chipper, crew, and assoc equipment	5025.34	Day	
26 05 05.10 1900	Electrical demolition, #2 wire, from conduit	30.50	CLF	
02 65 10.30 0110	3000 to 5000 gal. undgrnd steel tank removal	860.00	EA.	
02 65 10.30 1023	3000 to 5000 gal. tank, disposal, 100 mi RT	830.00	EA.	
02 65 10.30 0300	3000 to 5000 gal. tank, sludge removal	285.00	EA.	
02 65 10.30 0390	Dispose of sludge off site	6.80	Gal	
1305 05 75 0530	5000 to 12000 gal. abovegrnd steel tank removal	1625.00	EA.	
02 41 13.40 0110	Demolition, CMP pipe, steel, 12"	2.00	LF	
02 41 13.40 0160	Demolition, CMP pipe, steel, 18"	3.90	LF	
02 41 13.40 0170	Demolition, CMP pipe, steel, 24"	14.70	LF	
02 41 13.40 0180	Demolition, CMP pipe, steel, 30"-36"	17.65	LF	
24 41 13.40 0190	Demolition, CMP pipe, steel, 48-60"	22.00	LF	
13 05 05.60 0050	Silos, Selective Demolition, steel	2900.00	EA.	

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Lila Canyon Mine Reclamation Bond Estimate
Demolition and Removal Cost Summary

Structure/Item	Cost (\$)
01 Office/Bathhouse	64,877
02 ROM Coal Stockpile	0
03 Shop/Warehouse	66,094
04 Storage Shed	348
05 Employee Parking	96,771
06 Truck Loading/Unloading Area	0
07 Equipment/Materials Storage Area	0
08 Potable Water Tank	3,741
09 Sewer Treatment Plant	887
10 Power Poles	11,603
11 Electrical Transformers	4,961
12 Overhead Power Lines	2,952
13 Buried Power Lines	816
14 Rock Dust Silo	3,147
15 Fuel Tanks	6,265
16 Reclaim Tunnel	23,160
17 Reclaim Conveyor	3,709
18 Crusher Conveyor to Loadout Bin	2,739
19 Crusher MCC Building	364
20 Truck Loadout	512
21 Refuse Conveyor	826
22 Crusher/Screen Plant	3,913
23 Reclaim Escape Tunnel	12,851
24 Reclaim Feeder Gate	137
26 Extended ROM Conveyor	3,258
27 Refuse/Non-Coal Waste Pile	0
28 Electrical Grounding Field	1,986
29 Sedimentation Pond Spillways	1,430
30 Existing ROM Conveyor	6,432
31 Portal Closure	63,312
32 Concrete Conveyor Bay	371
33 ROM Coal Staking Tube	8,858
34 Mine MCC Building and Electrical Tower	1,595
35 Backup Ventilation Fans	37,668
36 Main Ventilation Fan	37,599
37 Non-Potable Water Tanks	7,670
38 Powder and Cap Magazines	4,924
39 Chain Link Fence	6,676
40 Concrete Electrical Junction Box	73
41 Loadout MCC Building	289
42 Mine Parking	35,311
43 Abandoned Concrete Reclaim Room	5,364
44 Jersey Barrier	10,640
45 Concrete Trash Chute	1,280
46 Emergency Reclaim Feeder Gate	69
Mine Substation	8,476
Paved Mine Roads	53,341
Culvert Demolition	46,055
Lila Old Fan Portals	24,586
Visual Disconnect	6,279
Drop Box	145
TOTAL	684,359

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	OT Office Workbooks																				
	Stockpile's Demolition Cost	See schedule of stockpile items >> 32,309 SF	12.63.03.00.0400	1.68 SF/Tp		150	300	15		15000								15000 SF Tps		25200	
	Stockpile's Vol. Demolition										720000							0.3	2500 CY		
	Rubble's Weight (exclude steel)																				
	Trucks Capacity																				
	Headings																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Iron Steel Drive																				
	Disposal Cost Iron Steel																				
	Trucks Weight																				
	Trucks Capacity																				
	Headings																				
	Transportation and Disposal Cost All	Demolition debris, off-site haul and disposal	Scame	4.00 Tons										400		Tons		800 Tons		3600	
	Transportation Cost Steel Drive																				
	Disposal Cost Steel																				
	Subtotal																				28800
	Equipment's Disposal Cost																				
	Dismantling Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition	Concrete Wall/Floor/Beam: 12" Thick, reinforced	02.41.18.17.2000	1.57 SF		150	100	1							15000 SF			1.3	555.8 CY		23100
	Concrete Cost																				
	Concrete Vol. Demolished																				
	Loading Costs	Front End Loader 3CY	01.23.16.02.1000	2.21 CY																	220
	Transportation Costs	12 CY 418 Spas (Dump Truck 107 net. Trip)	01.23.23.00.1014	3.54 CY																	2700
	Disposal Costs	On Site Disposal	02.41.18.17.4000	11.40 CY																	221
	Subtotal																				2521
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Total																				64171

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Seat Factor	Quantity	Unit	Cost	
	02-BOM Coal Stockpile																				
	Stockpile's Demolition Cost																				
	Stockpile's Vol. Demolition																				
	Truck's Weight (excludes steel)																				
	Truck's Capacity																				
	Haystack																				
	Transportation Cost Non-Steel Truck																				
	Transportation Cost Non-Steel Drive																				
	Haystack Coal Min Steel																				
	Steel's Weight																				
	Truck's Capacity																				
	Haystack																				
	Transportation and Driveway Cost All																				
	Transportation Cost Steel Drive																				
	Subtotal																				0
	Equipment's Disposal Cost																				
	Demolition Cost																				
	Equipment's Vol. Demolition																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				0
	Sub																				
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vol. Demolition																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				0
	Total																				0

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Ref.	Description	Materials	Items Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swat Factor	Quantity	Unit	Cost
	23 Steel Washdown																			
	Structure's Demolition Cost	See attached Monthly Items #12 509.87	13 03 05 50 0032	1.84	SP FS	150	100	20		15000								15000	SP FS	27600
	Structure's Vol. Demolition										300000							0.3	3333	CY
	Structure's Weight (excluding steel)																			
	Truck's Capacity																			
	Truck's Capacity																			
	Transportation Cost Non-Steel Truck																			
	Transportation Cost Non-Steel Drive																			
	Disposal Cost Non-Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Truck's Capacity																			
	Transportation and Disposal Cost All	Demolition debris, off-site haul and disposal	Scams	4.50	TON								450					800	TON	4800
	Transportation Cost Steel Drive																			
	Subtotal																			8
	Equipment's Disposal Cost																			30000
	Demolition Cost																			
	Equipment's Vol. Demolished																			
	Lockdown Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Slab																			
	Concrete Demolition																			
	Concrete Cost	Concrete Wash Floor Panels 12' thick, reinforced	02 41 18 17 2002	1.31	SP	150	100	1		150					15000	SP		15000	SP	23550
	Concrete Vol. Demolished																	1.3	223	CY
	Lockdown Costs	Post-End Layout NGV	01 20 18 42 1500	2.21	CV															1188
	Transportation Costs	17 CV 110 Tard/Duma Truck 1/2 ton Trip	01 22 23 20 1014	3.76	CV															2124
	Disposal Costs	On Site Disposal	02 41 18 17 4005	11.40	CV															8124
	Subtotal																			30840
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Lockdown Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			55044

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JAN 25 2018
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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost		
	D4 Storage Shed																					
	Structure's Demolition Cost	Building Demolition - Mixture of Types	02-41 16 13 0100	0.40	SF	8	8	8											512	SF	204.8	
	Structure's Vol. Demolition																	0.3	6	CY		
	Rubble's Weight (exclude steel)																					
	Truck's Capacity																					
	Hauling																					
	Transportation Cost Non-Steel Truck																					
	Transportation Cost Non-Steel Drive																					
	Disposal Cost Non-Steel																					
	Steel's Weight																					
	Truck's Capacity																					
	Hauling																					
	Transportation and Disposal Cost All	On Site Disposal	02-41 16 17 4200	11.40	CY														6	CY	68	
	Transportation Cost Steel Drive																					
	Disposal Cost Steel																					
	Subtotal																				272	
	Concrete Demolition	Concrete Floor Demolition, 4" thick, reinforced	02-41 16 17 0280	0.89	SF	8	8	0.33												64	SF	57
	Concrete Cost																					
	Concrete Vol. Demolished																					
	Loading Costs	Front End Loader 3CY	31-23 16 42 1300	2.21	CY													0.8	1	CY	2	
	Transportation Costs	12 CY (16 Ton) Dump Truck 1/2 rd. Trip	31-23 23 20 1014	3.74	CY															1	CY	4
	Disposal Costs	On Site Disposal	02-41 16 17 4200	11.49	CY															1	CY	15
	Subtotal																					78
	Concrete Demolition																					
	Concrete Cost																					
	Concrete Vol. Demolished																					
	Loading Costs																					
	Transportation Costs																					
	Disposal Costs																					
	Subtotal																					
	Concrete Demolition																					
	Concrete Cost																					
	Concrete Vol. Demolished																					
	Loading Costs																					
	Transportation Costs																					
	Disposal Costs																					
	Subtotal																					
	Total																					348

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JAN 25 2018
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Ref	Description	Materials	Mass Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swail Factor	Quantity	Unit	Cost	
	08 Truck Loading/Unloading Area																				
	Structure's Demolition Cost	WILL BE GRADED WITH THE REMAINDER OF THE FILL AT THE TIME OF RECLAMATION. EXCESS COAL TO BE BURIED AS INDICATED IN THE MDP.																			
	Structure's Vol. Demolition																				
	Structure's Weight (assault sheet)																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Non-Spool Truck																				
	Transportation Cost Non-Spool Truck																				
	Disposal Cost Non-Spool																				
	Structure's Weight																				
	Truck's Capacity																				
	Haulage																				
	Transportation and Disposal Cost All																				
	Transportation Cost Spool Crane																				
	Subtotal																				0
	Equipment & Disposal Cost																				
	Demolition Cost																				
	Equipment's Vol. Demolition																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				0
	Subtotal																				0
	Sub																				
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vol. Demolition																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Subtotal																				
	Total																				

INCORPORATED
 JAN 25 2018
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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	BT Equipment/Materials Storage Area																				
	Structure's Demolition Cost	WILL BE GRADED WITH THE REMAINDER OF THE FILL AT THE TIME OF RECLAMATION. EXCESS COAL TO BE BURIED AS INDICATED IN THE MRP.																			
	Structure's Vnl. Demolition																				
	Machine Weight (excluding steel)																				
	Truck's Capacity																				
	Wearage																				
	Transportation Cost Non-Steel Truck																				
	Transportation Cost Non-Steel Drive																				
	Disposal Cost Non-Steel																				
	Steel's Weight																				
	Truck's Capacity																				
	Wearage																				
	Transportation and Disposal Cost All																				
	Transportation Cost Steel Drive																				
	Subtotal																				0
	Equipment's Disposal Cost																				
	Remaining Cost																				
	Equipment's Vnl. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				0
	Bin																				
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vnl. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				0
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vnl. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				0
	Total																				0

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 JAN 25 2018
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Item	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swaf Factor	Quantity	Unit	Cost	
	08 Public Water Tank																				
	Structure's Demolition Cost	Building Demolition - Steel	02.41.18.13.020	0.27	SF				20	13								3534	SF	\$54	
	Structure's Vol. Demolition																	3299	SF		
	Truck's Weight (include steel)																				
	Truck's Capacity																				
	Playsite																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Olive																				
	Disposal Cost Non Steel																				
	Steel's Weight																				
	Truck's Capacity																				
	Playsite																				
	Transportation and Disposal Cost All	Demolition debris, include haul and disposal	Stamp	8.00	Ton								1.00					18.9F	0.65	Ton	4
	Transportation Cost Steel Olive																				
	Disposal Cost Steel																				
	Subtotal																				55
	Equipment's Disposal Cost																				
	Steering Cost																				
	Engine and Vol. Demolition																				
	Labor Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Deposition																				
	Concrete Cost	Concrete Floor Deposition, 8" thick, reinforced	02.41.18.17.020	8.11	SF	15	15	0.8											225	SF	233
	Concrete Vol. Demolition																				
	Labor Costs	Fixed Rate Lease 2017	01.23.18.42.000	2.71	CV																322
	Transportation Costs	12 CV 118. Area/Over. Truck 1/2 out. Trip	01.23.22.22.010	3.78	CV																646
	Disposal Costs	On Site Hauling	02.41.18.17.400	11.40	CV																353
	Subtotal																				276
	Total																				321

INCORPORATED
 JAN 25 2018
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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	02 Sewer Treatment Plant																				
	Structure's Demolition Cost	Building Demolition - Steel	02.41.18.12.0020	0.22	CF						1800				CF			1800	CF	488	
	Structure's Vol. Demolition																	0.3	26	CV	
	Rubble's Weight (exclude steel)																				
	Truck's Capacity																				
	Harbors																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Deliv																				
	Disposal Cost Non Steel																				
	Structure's Weight																				
	Truck's Capacity																				
	Harbors																				
	Transportation and Disposal Cost All	Demolition debris, off-site haul and disposal	Scrap	8.00	Ton									480		Bdry			5	Ton	30
	Transportation Cost Steel Deliv																				
	Disposal Cost Steel																				0
	Subtotal																				510
	Equipment's Disposal Cost																				
	Demolition Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Concrete Cost	Concrete Floor Demolition, 8" thick, reinforced	02.41.18.12.0420	1.11	SF		15	15	0.5						220	SF			222	SF	250
	Concrete Vol. Demolished																				
	Loading Costs	Front End Loader 30CY	01.23.18.42.1000	7.41	CV																10
	Transportation Costs	12 CY (16 Tons) Dump Truck 107 and. Top	01.23.23.20.1014	3.74	CV																20
	Disposal Costs	On Site Disposal	02.41.18.12.4500	11.40	CV																80
	Subtotal																				110
	Total																				620

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JAN 25 2018

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Item	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	10 Power Poles																				
	Structure's Demolition Cost	Wood utility poles, 35-45' high	02-41 13-80 0200	370.00	EA										13	EA		13	EA	4810	
	Structure's Demolition Cost	Wood cross arms, 4'-6" long	02-41 13-80 0300	135.00	EA										18	EA		18	EA	2430	
	Structure's Weight (exclude steel)																				
	Truck's Capacity																				
	Material																				
	Transportation Cost Non Steel Truck	Log chippers, skids, and other equipment	Class B-7	5025.34	Day																
	Transportation and Disposal Cost All																				
	Disposal Cost Non Steel																				
	Structure's Weight																				
	Truck's Capacity																				
	Material																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Tires																				
	Disposal Cost Steel																				
	Subtotal																				11850
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Mat, Demolished																				
	Leaving Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Mat, Demolished																				
	Leaving Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Total																				11850

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 JAN 25 2018
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Ref	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	11 Electrical Transformers																				
	Structure Demolition Cost																				
	Structure Vint. Demolition																				
	Structure Weight (excludes steel)																				
	Truck's Capacity																				
	Hourly																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Steel's Weight																				
	Truck's Capacity																				
	Hourly																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Drive																				
	Subtotal																				0
	Equipment's Demolition Cost	Removal of steel transformer 3.4kV, 750kVA	20 03 05 10 1872	1100.00	EA										2			2	EA	3400	
	Demolition Cost																				
	Equipment's Vint. Demolished																				
	Equipment Costs	Reclaiming items 54 ton with capacity	Box A-24	1112.00	Box															1	1112
	Transportation and Disposal Cost All	Demolition fabric, with steel and disposal	Boxe	6.00	Box															1	6
	Disposal Costs																				
	Subtotal																				4981
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vint. Demolished																				
	Leaving Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				0
	Total																				4981

INCORPORATED
 JAN 25 2018
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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	12 Overhead Power Lines																				
	Structure's Demolition Cost	City of Hamilton, B2 steel, non-steel	21 03 05 00 1000	30.50	LF	2220														2480	
	Structure's Vol. Demolition																				
	Structure's Weight (estimate steel)																				
	Truck's Capacity																				
	Hourly Rate																				
	Transportation Cost Non-Steel Trucks	Demolition trucks, all-in-1 bid and disposal	30000	9.00	per									201		hour			0.97	100	
	Transportation and Disposal Cost AS																				
	Disposal Cost Non-Steel																				
	Structure's Weight																				
	Truck's Capacity																				
	Hourly Rate																				
	Transportation Cost Steel Trucks																				
	Transportation Cost Steel Trucks																				
	Disposal Cost Steel																				
	Subtotal																				2480
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Total																				2480

INCORPORATED
 JAN 25 2018
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Ref.	Description	Material	Mine Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	13 Buried Power Lines																				
	Structure's Demolition Cost	Electric structure, 48 wire, from corral	23-05-05, 10, 1000	20.00	LF	800									3			2400	LF	810	
	Structure's Vol. Demolition																				
	Structure's Weight (concrete steel)																				
	Truck Capacity																				
	Hourly Rate																				
	Transportation Cost Non Steel Truck																				
	Transportation and Disposal Cost All	concrete debris, off site haul and disposal	Scamp	8.00	Yd									201		0.54		0.21	Yd	2	
	Disposal Cost Non Steel																				
	Structure's Weight																				
	Truck Capacity																				
	Hourly Rate																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Drive																				
	Disposal Cost Steel																				
	Subtotal																				810
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Total																				810

INCORPORATED
 JAN 25 2018
 Div. of Oil, Gas & Mining

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swab Factor	Quantity	Unit	Cost	
	14 Rock Cost Rate																				
	Structural Demolition Cost	Steel, Relative Demolition, steel	13 05 05 50 0050	2000.00	EA											1 EA			1 EA	2000	
	Structural Vnl. Demolition																				
	Rubber's Weight (hardcore steel)																				
	Trucks Capacity																				
	Hoisting																				
	Transportation Cost Non Street Truck	Demolition debris, off-site haul and disposal	Stamp	8.00	Ton											4 Ton			4 Ton	32	
	Transportation Cost Non Street Drive																				
	Disposal Cost Non Street																				
	Road's Weight																				
	Trucks Capacity																				
	Hoisting																				
	Transportation Cost Street Truck																				
	Transportation Cost Street Drive																				
	Disposal Cost Street																				
	Subtotal																				7911
	Equipment's Disposal Cost																				
	Dismantling Cost																				
	Equipment's Vnl. Demolished																				
	Landing Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vnl. Demolished																				
	Landing Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Concrete Cost	Concrete Walk/Floor Demos, 12" thick, reinforced	02 41 16 17 2500	1.57	CY	10	10	1			250					02		9	CY	14	
	Concrete Vnl. Demolished																	13	9	20	
	Landing Costs	Front End Loader 357y	01 03 16 00 3200	2.20	CY															27	
	Transportation Costs	12 01 110 Load Dump Truck 12' x 6' x 10'	01 03 13 00 3214	2.74	CY															35	
	Disposal Costs	See Site Document	02 41 16 17 4000	11.00	CY															379	
	Subtotal																				429
	Total																				1181

INCORPORATED

JAN 25 2008

Div. of Oil, Gas & Mining

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	15 Fuel Tanks																				
	Structure's Demolition Cost																				
	Structure's Vol. Demolition																				
	Structure's Weight (excludes steel)																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Structure's Weight																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Drive																				
	Subtotal																				0
	Equipment Disposal Cost																				
	Tank Removal	3000 to 5000 gal. unibond steel tank removal	02-95 10-30-8118	850.00	EA											3			3	EA	2550
	Remove Sludges	3000 to 5000 gal. tank, sludges removal	02-95 10-30-6200	285.00	EA											3			3	EA	855
	Tank Disposal	3000 to 5000 gal. tank, disposal, 100 mi RT	02-95 10-30-1023	830.00	EA											3			3	EA	2490
	Sludge Disposal	Disposal of sludge off site	02-95 10-30-0200	6.80	Gal											60			60	Gal	408
	Subtotal																				6203
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Total																				8105

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JAN 25 2018

Div. of Oil, Gas & Mining

Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
10 Reclaim Tunnel																				
Concrete Demolition Cost																				
Structure Vol. Demolition																				
Truck's Weight (includes driver)																				
Truck's Capacity																				
Heavys																				
Transportation Cost Non Steel Truck																				
Transportation Cost Non Steel Drive																				
Disposal Cost Non Steel																				
Truck's Weight																				
Truck's Capacity																				
Heavys																				
Transportation Cost Steel Truck																				
Transportation Cost Steel Drive																				
Disposal Cost Steel																				
Subtotal																				0
Equipment's Disposal Cost																				
Demolition Cost																				
Equipment's Vol. Demolished																				
Loading Costs																				
Transportation Costs																				
Disposal Costs																				
Subtotal																				
Concrete Demolition																				
Concrete Cost	Concrete Wall Ingr Demo, 12" thick, reinforced	02 41 18 17 2000	1.67	CY	810	8	8			600							800	CY	1507	
Concrete Vol. Demolished																	1.3			
Loading Costs	Front End Loader 3CY	31 23 16 42 1300	2.21	CY														1248	CY	2758
Transportation Costs	12 CY 410 Ton (Dump Truck 1/2 mil. Top)	31 23 23 20 1014	3.74	CY														1248	CY	4668
Disposal Costs	On Site Disposal	02 41 18 17 4000	11.40	CY														1248	CY	14227
Subtotal																				31190
Concrete Demolition																				
Concrete Cost																				
Concrete Vol. Demolished																				
Loading Costs																				
Transportation Costs																				
Disposal Costs																				
Subtotal																				
Total																				31190

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JAN 25 2018

Div. of Oil, Gas & Mining

Ref	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
17	Reclaim Conveyor																			
	Conveyor Demolition Cost	Building Demolition - Steel		62.41	16.13	0020										CF		168	CF	2,492
	Structure's Vol. Demolition																			
	Structure's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck	Demolition debris, off-site haul and disposal	Stamp	8.00	Ton								400			80CY		35	Ton	210
	Transportation Cost Steel Drive																			
	Disposal Cost Steel																			
	Subtotal																			3700
	Equipment's Disposal Cost																			
	Disassembly Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			7000

INCORPORATED
JAN 25 2018
 Div. of Oil, Gas & Mining

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swel Factor	Quantity	Unit	Cost	
	18 Crusher Conveyor to Loadout Bin																				
	Structure's Demolition Cost	Building Demolition - Steel	02 41 16 13 0020	0.27	CF	230	0	0								FT	0.3	8280	CF	2230	
	Structure's Vol. Demolition																				
	Truck's Weight (excludes steel)																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Steel's Weight																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Steel Truck	Demolition debris, off-site haul and disposal	Scamp	6.00	Ton								480				0.5	22	Ton	132	
	Transportation Cost Steel Drive																				
	Disposal Cost Steel																				
	Subtotal																				2308
	Equipment's Disposal Cost																				
	Dismantling Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Concrete Cost	Concrete Wall/Door Demo, 12" thick, reinforced	02 41 10 17 2200	1.57	CY						15									15	24
	Concrete Vol. Demolished																				
	Loading Costs	Front End Loader 3CY	31 23 10 42 1200	2.21	CY															20	44
	Transportation Costs	12 CY (18 Ton) Dump Truck 102 roof Trip	31 20 23 20 1014	3.74	CY															20	75
	Disposal Costs	On Site Disposal	02 41 10 17 4200	11.46	CY															20	228
	Subtotal																				311
	Total																				2725

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 JAN 25 2018
 Div. of Oil, Gas & Mining

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost		
	18 Crusher MCC Building																					
	Structure's Demolition Cost	Building Demolition - Steel	02 41 16 13 0020	0.27	CF	20	8	8										1280	CF	340		
	Structure's Vol. Demolition																	0.7	14	CY		
	Structure's Weight (exclude steel)																					
	Truck's Capacity																					
	Haulage																					
	Transportation Cost Non Steel Truck																					
	Transportation Cost Non Steel Drive																					
	Disposal Cost Non Steel																					
	Structure's Weight																					
	Truck's Capacity																					
	Haulage																					
	Transportation Cost Steel Truck	Demolition debris, off-site haul and disposal	Scamp	0.00	Ton								480							3	Ton	18
	Transportation Cost Steel Drive																					
	Disposal Cost Steel																					
	Subtotal																					304
	Equipment's Disposal Cost																					
	Dismantling Cost																					
	Equipment's Vol. Demolished																					
	Loading Costs																					
	Transportation Costs																					
	Disposal Costs																					
	Subtotal																					
	Concrete Demolition																					
	Concrete Cost																					
	Concrete Vol. Demolished																					
	Loading Costs																					
	Transportation Costs																					
	Disposal Costs																					
	Subtotal																					
	Concrete Demolition																					
	Concrete Cost																					
	Concrete Vol. Demolished																					
	Loading Costs																					
	Transportation Costs																					
	Disposal Costs																					
	Subtotal																					
	Total																					304

INCORPORATED
 JAN 25 2018
 Div. of Oil, Gas & Mining

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swelt Factor	Quantity	Unit	Cost		
	20 Truck Loadout																					
	Structure's Demolition Cost	Building Demolition - Steel	02 41 10 12 0020	0.27	CF	5	5	20								500	CF		500	CF	135	
	Structure's Vol. Demolition																	0.3		0	CF	
	Rubble's Weight (exclude steel)																					
	Truck's Capacity																					
	Haulage																					
	Transportation Cost Non Steel Truck																					
	Transportation Cost Non Steel Drive																					
	Disposal Cost Non Steel																					
	Steel's Weight																					
	Truck's Capacity																					
	Haulage																					
	Transportation Cost Steel Truck	Demolition debris, off-site haul and disposal	Scamp	0.00	Ton								450				1	TON		0		
	Transportation Cost Steel Drive																					
	Disposal Cost Steel																					
	Subtotal																				141	
	Equipment's Disposal Cost																					
	Dismantling Cost																					
	Equipment's Vol. Demolished																					
	Loading Costs																					
	Transportation Costs																					
	Disposal Costs																					
	Subtotal																					
	Concrete Demolition																					
	Concrete Cost	Concrete Wall/door Demo, 12" thick, reinforced	02 41 10 12 2500	1.57	CY						15									15	CY	24
	Concrete Vol. Demolished																					
	Loading Costs	Front End Loader 3CY	01 29 10 43 1300	2.31	CY															13	CY	45
	Transportation Costs	12 CY LHS Front Dump Truck 40'rod. Top	01 22 23 20 1014	3.74	CY															20	CY	75
	Disposal Costs	On Site Disposal	02 41 10 12 4200	11.40	CY															20	CY	228
	Subtotal																					371
	Concrete Demolition																					
	Concrete Cost																					
	Concrete Vol. Demolished																					
	Loading Costs																					
	Transportation Costs																					
	Disposal Costs																					
	Subtotal																					
	Total																					512

INCORPORATED

JAN 25 2018

Div. of Oil, Gas & Mining

Ref.	Description	Materials	Alcove Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swel Factor	Quantity	Unit	Cost	
	21 Refuse Conveyor																				
	Conveyor Demolition Cost	Building Demolition - Steel	02 41 10.13.0020	0.27	CF	100	4	4								FT		2880	CF	778	
	Shedder's Vial Demolition																	0.3	32	CY	
	Shedder's Weight (excavate steel)																				
	Track's Capacity																				
	Hardware																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Shedder's Weight																				
	Track's Capacity																				
	Hardware																				
	Transportation Cost Steel Truck	Demolition debris, off-site haul and disposal	Scrap	6.00	Ton								400			80		8	Ton	48	
	Transportation Cost Steel Drive																				
	Disposal Cost Steel																				0
	Subtotal																				620
	Equipment's Demolition Cost																				
	Demolition Cost																				
	Equipment's Vial Demolition																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vial Demolition																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vial Demolition																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Total																				

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JAN 25 2018

Div. of Oil, Gas & Mining

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	22 Cusher/Screen Plant																				
	Structure's Demolition Cost	Building Demolition - Steel	02 41 16.13 0020	0.27	CF						12000					CF	0.3	12000	CF	3240	
	Structure's Vol. Demolition																				
	Rubbish's Weight (excludes steel)																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Steel's Weight																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Steel Truck	Demolition debris, off-site haul and disposal	Scamp	0.60	Ton								460			60	1.3	32	Ton	192	
	Transportation Cost Steel Drive																				
	Disposal Cost Steel																				0
	Subtotal																				3432
	Equipment's Disposal Cost																				
	Dismantling Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Concrete Cost	Concrete Wall/Floor Demo, 12" thick, reinforced	02 41 16.17 2500	1.57	CY						20										31
	Concrete Vol. Demolished																				
	Loading Costs	Front End Loader 3CY	31 23 18.42 1300	2.21	CY																97
	Transportation Costs	12 CY 140 Ton Dump Truck 107' rad. Top	31 23 23.20 1014	3.74	CY																97
	Disposal Costs	On Site Disposal	02 41 16.17 4200	11.46	CY																260
	Subtotal																				401
	Total																				3933

INCORPORATED

JAN 25 2018

Div. of Oil, Gas & Mining

Ref.	Description	Materials	Mears Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost				
	23 Reclaim Escape Tunnel																							
	Compacted Fill	Building Demolition - Steel	02 41 10 13 0020	0.27/CF							20800					CF		20800	CF	7258				
	Escape Tunnel	Building Demolition - Steel	02 41 10 13 0020	0.27/CF							1201							1201	CF	328				
	Fan	Building Demolition - Steel	02 41 10 13 0020	0.27/CF							64							64	CF	17				
	Fan House	Building Demolition - Steel	02 41 10 13 0020	0.27/CF							512							512	CF	138				
	Shelburn's Vol. Demolition																							
	Shelburn's Weight (inside steel)																	0.9		318	CF			
	Truck's Capacity																							
	HAZMAT																							
	Transportation Cost Non Steel Truck																							
	Transportation Cost Non Steel Drive																							
	Disposal Cost Non Steel																							
	Steel's Weight																							
	Truck's Capacity																							
	HAZMAT																							
	Transportation Cost Steel Truck	Demolition debris, off-site haul and disposal	Scamp	0.00/Ton									460			buCY				77	Ton	492		
	Transportation Cost Steel Drive																							
	Disposal Cost Steel																							
	Subtotal																				8214			
	Excavation and Backfill																							
	Reclaim Tunnel	Excavation Bulk Back 2 CY (3228L)	31 23 10 42 0200	1.81/CY		350	14	10													1813	CV	3285	
	Escape Tunnel	Excavation Bulk Back 2 CY (3228L)	31 23 10 42 0200	1.81/CY		324	4	10													481	CV	871	
	Subtotal																						4156	
	Concrete Demolition																							
	Concrete Cost	Concrete Wall Foot Dams, 12" Back, reinforced	02 41 10 17 2000	1.87/CY							20											20	CV	31
	Concrete Vol. Demolished																							
	Loading Costs	Fines and Lumber 3CY	31 23 10 41 1000	2.31/CY																				
	Transportation Costs	12 CY @ 10 Tons (Dump Truck 402 vol. 10)	31 23 23 30 1014	3.24/CY																				
	Disposal Costs	Off-Site Disposal	02 41 10 17 4000	11.05/CF																				
	Subtotal																							
	Concrete Demolition																							
	Concrete Cost																							
	Concrete Vol. Demolished																							
	Loading Costs																							
	Transportation Costs																							
	Disposal Costs																							
	Subtotal																							
	Total																						12093	

INCORPORATED

JAN 25 2018

Div. of Oil, Gas & Mining

Ref.	Description	Materials	Material Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	24 Rocking Transfer Gate																				
	Structure's Demolition Cost	Removal of steel plate 121-500 lb.	05-95-05-111-0000	60.00	E.A.													1	E.A.	120	
	Structure's Vol. Demolition																				
	Truck's Weight (excludes steel)																				
	Truck's Capacity																				
	Hardware																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Steel's Weight																				
	Truck's Capacity																				
	Hardware																				
	Transportation & Disposal Cost Steel	Demolition debris, all site haul and disposal	440000	0.00	ton	2	2							20.4			0.97	0.18	ton	1	
	Transportation Cost Steel Drive																				
	Subtotal																				137
	Equipment's Disposal Cost																				
	Dismantling Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				3
	Total																				137

INCORPORATED
 JAN 25 2018
 Div. of Oil, Gas & Mining

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	29 Extended BOM Concrete																				
	Structure Demolition Cost	Structure Demolition - Steel	02 41 16 12 0020	0.22	CF	300	8	4								CF		10800	CF	2318	
	Structure Vnl. Demolition																	0.3	3240	CF	
	Truck's Weight (exclude steel)																				
	Truck's Capacity																				
	Material																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Material Cost Non Steel																				
	Steel's Weight																				
	Truck's Capacity																				
	Material																				
	Transportation Cost Steel Truck	Demolition debris, offsite haul and disposal	Scema	4.08	Ton									400		CF		20	Ton	174	
	Transportation Cost Steel Drive																				
	Disposal Cost Steel																				0
	Subtotal																				3092
	Equipment's Disposal Cost																				
	Material Cost																				
	Equipment's Vnl. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Concrete Cost	Concrete Wash floor Demol. 12' max. reinforced	02 41 16 12 2000	1.87	CF	30	12	1													11
	Concrete Vnl. Demolished																				
	Loading Costs	Hand End Loader 3CY	11 23 30 42 1000	2.21																	22
	Transportation Costs	12 CY 198' Semi Dump Truck 12' max. 100'	21 23 30 48 1014	3.44	CF																33
	Disposal Costs	On Site Disposal	02 41 16 12 4020	11.40	CF																102
	Subtotal																				144
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vnl. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Total																				3600

INCORPORATED

JAN 25 2018

Div. of Oil, Gas & Mining

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	27 Refuse Non-Coal Waste Pile																				
	Structure's Demolition Cost																				
	Structure's Vol. Demolished																				
	Structure's Weight (excludes steel)																				
	Truck's Capacity																				
	Height																				
	Transportation Cost Non-Steel Truck																				
	Transportation Cost Non-Steel Drive																				
	Structure's Cost Non-Steel																				
	Structure's Weight																				
	Truck's Capacity																				
	Height																				
	Transportation and Disposal Cost All																				
	Transportation Cost Steel Drive																				
	Subtotal																				0
	Equipment's Disposal Cost																				
	Diameter's Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Channel Costs																				
	Subtotal																				0
	Subtotal																				0
	Subtotal																				0
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Channel Costs																				
	Disposal Costs																				
	Subtotal																				0
	Total																				0

INCORPORATED
 JAN 25 2018
 Div. of Oil, Gas & Mining

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost		
	28 Electrical Grounding Field																					
	Structure's Demolition Cost	Backhoe loader, 2 laborers, equip operator	Crane B-8	1000.00	Day										1				1	Day	1000	
	Structure's Vol. Demolition																					
	Rubble's Weight (exclude steel)																					
	Truck's Capacity																					
	Haulage																					
	Transportation Cost Non Steel Truck																					
	Transportation Cost Non Steel Drive																					
	Disposal Cost Non Steel																					
	Steel's Weight																					
	Truck's Capacity																					
	Haulage																					
	Transportation Cost Steel Truck	Demolition debris, off-site haul and disposal	Scrap	0.00	Ton															1	Ton	0
	Transportation Cost Steel Drive																					
	Disposal Cost Steel																					
	Subtotal																				1000	
	Equipment's Disposal Cost																					
	Dismantling Cost																					
	Equipment's Vol. Demolished																					
	Loading Costs																					
	Transportation Costs																					
	Disposal Costs																					
	Subtotal																					
	Concrete Demolition																					
	Concrete Cost																					
	Concrete Vol. Demolished																					
	Loading Costs																					
	Transportation Costs																					
	Disposal Costs																					
	Subtotal																				0	
	Concrete Demolition																					
	Concrete Cost																					
	Concrete Vol. Demolished																					
	Loading Costs																					
	Transportation Costs																					
	Disposal Costs																					
	Subtotal																					
	Total																				1000	

INCORPORATED
 JAN 25 2018
 Div. of Oil, Gas & Mining

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swat Factor	Quantity	Unit	Cost		
	29 Sedimentation Pond Spillways																					
	Pond #2 Barrel Excavation	Excavation Bulk Bank 2.0Y (32298.1)	31 23 16 42 0200	1.61	CY	168	1.5	3								FT		28	CY	50		
	Subtotal																				50	
	Equipment's Disposal Cost																					
	Dismantling Cost																					
	Equipment's Vol. Demolished																					
	Loading Costs																					
	Transportation Costs																					
	Disposal Costs																					
	Subtotal																					
	Pond #1 - 30" Principal Rise	Demolition, CMP pipe, steel, 30"-30"	02 41 13 40 0109	17.00	LF	20								30	hr	FT		20	FT	353		
	Pond #1 - 30" Emergency Rise	Demolition, CMP pipe, steel, 30"-30"	02 41 13 40 0109	17.00	LF	18								30	hr	FT		18	FT	305		
	Pond #2 - 12" Principal Rise	Demolition, CMP pipe, steel, 12"	02 41 13 40 0110	2.00	LF	6								100	hr	FT		6	FT	13		
	Pond #2 - 12" Emergency Rise	Demolition, CMP pipe, steel, 12"	02 41 13 40 0109	3.00	LF	0								10	hr	FT		0	FT	23		
	Pond #2 Barrel (B#2-1)	Demolition, CMP pipe, steel, 18"	02 41 13 40 0109	3.00	LF	165								11	hr	FT		165	FT	644		
	Concrete Vol. Demolished																					
	Loading Costs																					
	Transportation & Disposal Costs	Demolition debris, off-site haul and disposal	Scamp	6.00	Ton							4100	lb							2	Tons	12
	Disposal Costs																					
	Subtotal																				1350	
	Total																				1430	

INCORPORATED
 JAN 25 2018
 Div. of Oil, Gas & Mining

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost			
	200 # Building ROM Concrete																						
	Structure's Demolition Cost	Building Demolition - Steel	82 41 18 12 0020	0.22	CF	475	6	8								FT		17100	CF	4912			
	Structure's Vol. Demolition																0.3		182	CV			
	Structure's Weight (exclude steel)																						
	Trucks Capacity																						
	Trucks																						
	Transportation Cost Non Steel Trucks																						
	Transportation Cost Non Steel Drive																						
	Disposal Cost Non Steel																						
	Steel's Weight																						
	Trucks Capacity																						
	Trucks																						
	Transportation Cost Steel Truck	Demolition debris, offsite haul and disposal	Scamp	0.60	Ton									480		in CV			49	Ton	276		
	Transportation Cost Steel Drive																						
	Disposal Cost Steel																				0		
	Subtotal																				4932		
	Equipment's Disposal Cost																						
	Disposal Cost																						
	Equipment's Vol. Demolished																						
	Equipment's Cost																						
	Transportation Costs																						
	Disposal Costs																						
	Subtotal																						
	Concrete Demolition																						
	Concrete Cost	Concrete Wall/Floor Cms. 12" thick - reinforced	82 41 18 12 2000	1.51	CV	24	24	1								3				64	CV	100	
	Concrete Vol. Demolished																						
	Concrete Cost	Front End Loader 3CV	31 29 18 40 1500	2.31																	83	CV	183
	Transportation Costs	14 CV 118 Tons Dump Trucks 12' cub. Yds	31 29 22 30 1014	9.74	CV																83	CV	310
	Disposal Costs	On Site Disposal	82 41 18 12 4000	11.46	CV																83	CV	436
	Subtotal																					1030	
	Concrete Demolition																						
	Concrete Cost																						
	Concrete Vol. Demolished																						
	Equipment's Cost																						
	Transportation Costs																						
	Disposal Costs																						
	Subtotal																						
	Total																					6352	

INCORPORATED

JAN 25 2018

Div. of Oil, Gas & Mining

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swelt Factor	Quantity	Unit	Cost		
	11 Portal Closure																					
	Concrete Demolition Cost	Building Demolition - Steel	02.41.18.13.0020	0.27	CF	18	16	10										20480	CF	5520		
	Structure Val. Demolished																	8.3	223	CF		
	Barbed Wire (exclusive steel)																					
	Trucks Capacity																					
	Material																					
	Transportation Cost Non Road Truck																					
	Transportation Cost Non Road Drive																					
	Disposal Cost Non Steel																					
	Steel's Weight																					
	Trucks Capacity																					
	Material																					
	Transportation Cost Steel Truck	Demolition debris, off-site haul and disposal	Scdm	8.99	Ton									480					16	Ton	320	
	Transportation Cost Steel Drive																					
	Disposal Cost Steel																					
	Subtotal																				2880	
	Earthwork - North & South Breakouts																					
	Cut and Fill - North Breakout	Cut and fill concrete earth, 8' - 10' 2 passes	01030.1100	7.00	CY						80									80	CY	560
	Cut and Fill - South Breakout	Cut and fill concrete earth, 8' - 10' 2 passes	01030.1100	7.00	CY						70									70	CY	490
	Leaving Costs																					
	Transportation Costs																					
	Disposal Costs																					
	Subtotal																					700
	Concrete Demolition																					
	Concrete Cost																					
	Concrete Val. Demolished																					
	Leaving Costs																					
	Transportation Costs																					
	Disposal Costs																					
	Subtotal																					0
	Portal Roadway																					
	Road Construction	Best asphalt, multi-lift	NonCom	420.00	S.A.																	
	Labor	Best asphalt, labor	NonCom	200.00	Unit																	
	Site preparation	Prepared, 100' x 100' x 10'	Comp. R.L.	1494.00	Day																	
	Stone retaining walls	Block wall, 10' high, 4' thick @ each end	R.C. 02.02.1100	2.25	SF	20	8.5			340										550	SF	1237.5
	Transportation Costs	Material haulage, material haulage	02.02.1100	1100.00	Job															1	Job	1100.00
	Disposal Costs																					
	Subtotal																					2000
	Total																					6310

INCORPORATED
JAN 25 2018
Div. of Oil, Gas & Mining

Ref	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	32 Concrete Concrete Bay																				
	Shovel's Demolition Cost																				
	Shovel's Vol. Demolition																				
	Shovel's Weight (exclusive steel)																				
	Truck's Capacity																				
	Height																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Steel's Weight																				
	Truck's Capacity																				
	Height																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Drive																				
	Disposal Cost Steel																				0
	SubTotal																				0
	Equipment's Disposal Cost																				
	Dismantling Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Channel Costs																				
	SubTotal																				
	Concrete Demolition																				
	Concrete Cost	Concrete Wall/Floor Demol. 12" thick, reinforced	02-41-18-17-2500	1.57 CV							15										24
	Concrete Vol. Demolished																				
	Loading Costs	Front End Loader 30CV	31-23-18-43-1200	2.21																	54
	Transportation Costs	32 CV 118.5 ton (Dodge Truck 54 and Top	31-23-23-23-1914	3.74 CV																	78
	Disposal Costs	As Site Disposal	02-41-18-17-2200	11.48 CV																	228
	SubTotal																				314
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	SubTotal																				
	Total																				314

INCORPORATED
JAN 25 2018
 Div. of Oil, Gas & Mining

Ref.	Description	Materials	Mims Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	33 ROM Coal Staking Tube																				
	Structure Demolition Cost	Building Demolition - Steel	02.41.16.13.0920	0.27	CF				80	20						CF		25133	CF	6760	
	Structure Vol. Demolition																	0.3	228	CF	
	Roller's Weight (excludes steel)																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Roller's Weight																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Steel Truck	Demolition debris, off-site haul and disposal	Scrap	6.00	Ton								480			TON			67	Ton	402
	Transportation Cost Steel Drive																				
	Disposal Cost Steel																				0
	Subtotal																				7166
	Equipment's Disposal Cost																				
	Dismantling Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition	Concrete Wash for Demo, 12" thick, reinforced	02.41.16.12.2509	1.37	CY	25	25	3								FT		1.3	60	CY	168
	Concrete Cost																				
	Loading Costs	Front End Loader 3CY	21.22.18.42.1300	2.23	CY																160
	Transportation Costs	12 CY 110' Top Dump Truck 42' rol. Trip	21.22.22.20.1014	3.74	CY																212
	Disposal Costs	On Site Disposal	02.41.16.12.2509	11.88	CY																1024
	Subtotal																				1404
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Total																				8570

INCORPORATED
JAN 25 2018
Div. of Oil, Gas & Mining

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	34 Mine MCC Building and Electrical Tower																				
	MCC Bldg Demolition Cost	Pig-iron- and steel Mill slabs = 17,500 SF	13 09 05 50 0000	1.68 SF	480	30.0	12	0									0.3	200 SF	FS	810	
	Elect. Tower Demolition Cost	Tooth cutting, steel, 1" thick plate	02 41 10 27 0000	3.21 LF	220												0.4	200 LF	FS	780	
	Rubble's Weight (exclusive of soil)																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Steel's Weight																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Steel Truck	Demolition debris, off-site haul and disposal	Scamp	6.00 Ton																	
	Transportation Cost Steel Drive																				
	Disposal Cost Steel																				
	Subtotal																				1432
	Equipment's Disposal Cost																				
	Demolition Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Concrete Cost	Front End Loader 3CY	31 23 18 42 1300	2.21 CY		30.0	12	0.5													
	Concrete Vol. Demolished																				
	Loading Costs	Front End Loader 3CY	31 23 18 42 1300	2.21																	
	Transportation Costs	12 CY (10 Ton) Dump Truck 1/2 red. Trip	31 23 23 20 1014	3.74 CY																	
	Disposal Costs	On Site Disposal	02 41 10 17 4200	11.40 CY																	
	Subtotal																				172
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				0
	Total																				1680

INCORPORATED
 JAN 25 2018
 Div. of Oil, Gas & Mining

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	35 Backup Ventilation Fans																				
	Structure's Demolition Cost																				
	Structure's Vol. Demolition																				
	Rubble's Weight (excludes steel)																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Sheet's Weight																				
	Truck's Capacity																				
	Haulage																				
	Transportation Cost Steel																				
	Transportation Cost Steel Drive																				
	Subtotal																				0
	Equipment's Disposal Cost																				
	Demolition Cost	Mechanical Equipment Demolition Heavy	23 05 05 10 3000	1225.00	Ton							30				Ton		30	Ton	36750	
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transportation and Disposal Cost All	Demolition debris, off-site haul and disposal	Scamp	0.50	Ton														30	Ton	150
	Disposal Costs																				
	Subtotal																				24920
	Concrete Demolition																				
	Concrete Cost	Concrete Wall (see Items 17" thick, reinforced	02 41 16 17 2500	1.57	SF	20	20	0.5		400									400	SF	628
	Concrete Vol. Demolished																				
	Loading Costs																				0
	Transportation Costs																				0
	Disposal Costs	On Site Disposal	02 41 16 17 4200	11.60	CY						7.4								10	CY	110
	Subtotal																				738
	Shot Costs																				
	Concrete Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				0
	Subtotal																				0
	Total																				77653

INCORPORATED
 JAN 25 2018
 Div. of Oil, Gas & Mining

Ref	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost		
	30 Main Ventilation Fan																					
	Structure's Demolition Cost																					
	Structure's Vol. Demolition																					
	Structure's Weight (excludes steel)																					
	Truck's Capacity																					
	Haillage																					
	Transportation Cost Non Steel Truck																					
	Transportation Cost Non Steel Drive																					
	Disposal Cost Non Steel																					
	Steel's Weight																					
	Truck's Capacity																					
	Haillage																					
	Transportation Cost Steel Helicopter	Picket and approach, made at handage	Class Helicopters	11993.00	Job										0.2	Day		0.2	Day	2007		
	Transportation Cost Steel Drive																					
	Subtotal																			2292		
	Equipment's Disposal Cost																					
	Dismantling Cost	Mechanical Equipment Demolition, Heavy	23 05 05 10 3000	1225.00	Ton							28				Ton		28	Ton	34300		
	Equipment's Vol. Demolished																					
	Loading Costs																					
	Transportation and Disposal Cost All	Demolition debris, off-site haul and disposal	Scamp	6.00	Ton														28	Ton	168	
	Disposal Costs																					
	Subtotal																			34455		
	Concrete Demolition																					
	Concrete Cost	Concrete Wall for Down 12" Rock, reinforced	02 41 18 17 2000	1.51	SF	20	20	0.3		400									400	SF	628	
	Concrete Vol. Demolished																					
	Loading Costs																					
	Transportation Costs																					
	Disposal Costs	On Site Disposal	02 41 18 17 4200	11.40	CY						7.4								1.3	10	CY	110
	Subtotal																			730		
	Shotcrete																					
	Concrete Vol. Demolished																					
	Loading Costs																					
	Transportation Costs																					
	Disposal Costs																					
	Subtotal																			0		
	Total																			31900		

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 JAN 25 2018
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Ref	Description	Materials	Items Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swot Factor	Quantity	Unit	Cost
	37 Non-Portable Water Tanks																			
	Structure & Demolition Cost	5000 lb. 12000 gal. above-ground steel tank removal	1304-05-28-0037	1028.00	EA											27.6		27.6	EA	4875
	Structure's Vol. Demolition																			
	Structure's Weight (excluding steel)																			
	Truck's Capacity																			
	Truck's																			
	Transportation Cost Non-Steel Truck																			
	Transportation Cost Non-Steel Drive																			
	Disposal Cost Non-Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Truck's																			
	Material	Demolition debris, off-site haul and disposal	Scrap	8.00	Ton											2.00		2.00	Ton	12
	Transportation and Disposal Cost All																			
	Transportation Cost Steel Drive																			
	Disposal Cost Steel																			
	Subtotal																			4887
	Equipment's Operation Cost																			
	Operating Cost																			
	Equipment's Vol. Demolition																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Operation	Concrete Floor Demolition, 6" thick, reinforced	02-41-16-17-0459	1.11	YD	15	15	0.3												275
	Concrete Cost																			
	Concrete Vol. Demolition																			
	Loading Costs	Front End Loader 3CY	01-22-88-02-1000	2.21	CY															320
	Transportation Costs	12 CY 418 Ton 18000 Truck 1/2 ton Top	01-20-00-00-1014	3.74	CY															549
	Disposal Costs	No Bag Material	02-41-16-17-0500	11.40	CY															1865
	Subtotal																			2782
	Total																			7669

INCORPORATED
 JAN 25 2018
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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	38 Powder and Cap Magazines																				
	Structure's Demolition Cost	Mechanical Equipment Demolition, Heavy	23.05.05.10.3000	1225.00	Ton							4				Ton		4	Ton	4900	
	Structure's Vol. Demolition																				
	Structure's Weight (excludes steel)																				
	Truck's Capacity																				
	Hauling																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Structure's Weight																				
	Truck's Capacity																				
	Hauling																				
	Transportation and Disposal Cost AS	Demolition debris, off-site haul and disposal	Strawp	4.00	Ton							4				Ton		4	Ton	20	
	Transportation Cost Steel Drive																				
	Subtotal																				4920
	Equipment's Disposal Cost																				
	Dismantling Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Total																				4920

INCORPORATED
 JAN 25 2018
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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	30 Chain Link Fence																				
	Structure's Demolition Cost																				
	Structure's Vol. Demolition																				
	Rubble & Waste (assume steel)																				
	Truck's Capacity																				
	Hourly																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Steel's Weight																				
	Truck's Capacity																				
	Hourly																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Drive																				
	Subtotal																				0
	Equipment & Disposal Cost																				
	Demolition Cost																				
	Equipment & Vol. Demolition																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Fence Demolition	Chain link removal, 6'x12' high	02.41.13.69.1200	4.44	FT	1500													1500	FT	6600
	Transportation and Disposal	Demolition debris, off-site haul and disposal	Sojma	6.00	Ton									3.5					225	Ton	1350
	Subtotal																				6950
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vol. Demolition																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Total																				6950

INCORPORATED
 JAN 25 2018
 Div. of Oil, Gas & Mining

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	40 Concrete Reinforced Junction Box																				
	Shrinkage Compensation Cost																				
	Shrinkage Vol. Description																				
	Quantity Weight (assume steel)																				
	Truck Capacity																				
	Hauling																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Steel's Weight																				
	Truck's Capacity																				
	Hauling																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Drive																				
	Subtotal																				
	Equipment's Discount Cost																				
	Overhead's Cost																				
	Equipment's Vol. Described																				
	Leasing Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Foundation																				
	Footings																				
	Reinforce	Concrete Wall/Post Footing, 12" Thick, reinforced	02-41 16.17 2500	1.51 CY		2	2	1			11								11 CY		17
	Concrete Cost	Concrete Wall/Post Footing, 12" Thick, reinforced	02-41 16.17 3500	1.57 CY		4	4	1			21								21 CY		2
	Concrete Vol. Described																		1.3		46 CY
	Leasing Costs	Front End Loader 3CY	31-23 16.47 1300	2.21 CY																	8
	Transportation Costs	12 CY 110' Top Drive Truck 112' x 60" Top	31-22 23.20 1014	3.54 CY																	15
	Disposal Costs	On Site Disposal	02-41 16.17 4000	11.40 CY																	48
	Subtotal																				78
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vol. Described																				
	Leasing Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Total																				156

INCORPORATED
 JAN 25 2018
 Div. of Oil, Gas & Mining

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	41 Loadout MCC Building																			
	MCC Bldg Demolition Cost	Pre-engineered steel bldg dem. = 12,500 SF	13 05 05 50 0050	1.68 SF/Ft		10	6	6										128 SF/Ft		213
	Rubble's Weight (exclude steel)																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Spore's Weight																			
	Truck's Capacity																			
	Haulage																			
	Transportation Cost Steel Truck	Demolition debris, off site haul and disposal	Scrap	6.02 Ton								430				9.0CY	0.3		3 Ton	18
	Transportation Cost Steel Drive																			
	Disposal Cost Steel																			
	Subtotal																			231
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost	Front End Loader 3CY	31 23 18 47 1300	2.21 CY		10	6	0.5											2 CY	4
	Concrete Vol. Demolished																			
	Loading Costs	Front End Loader 3CY	31 23 18 47 1300	2.21																3 CY
	Transportation Costs	12 CY 118 Ton Dump Truck 1/2 nod Trip	31 23 23 20 1614	3.14 CY																3 CY
	Disposal Costs	On Site Disposal	02 41 16 17 4200	11.40 CY																3 CY
	Subtotal																			30
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			0
	Total																			263

INCORPORATED
 JAN 25 2018
 Div. of Oil, Gas & Mining

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Sweld Factor	Quantity	Unit	Cost	
	42 Max Parking																				
	Structure's Demolition Cost																				
	Structure's Vol. Demolition																				
	Structure's Weight (excludes steel)																				
	Trucks Capacity																				
	Headage																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Transport Cost Non Steel																				
	Steel's Weight																				
	Trucks Capacity																				
	Headage																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Drive																				
	Subtotal																				0
	Equipment's Disposal Cost																				
	Dismantling Cost																				
	Equipment's Vol. Demolished																				
	Landfill Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				0
	Payment Removal	Payment Removal, 4' to 4' thick	02-41-13-17-5000	0.80/SY					0.31	27000								2080/SY		30272	
	Disposal Costs	On Site Disposal	02-41-10-12-2000	11.80/1CY								240						1.2	440/1CY	4098	
	Subtotal																				35011
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vol. Demolished																				
	Landfill Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Total																				35011

INCORPORATED
 JAN 25 2018
 Div. of Oil, Gas & Mining

Ref.	Description	Materials	Mears Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swel Factor	Quantity	Unit	Cost
43 Abandonment Concrete Retention Basins																				
	Site/area's Demolition Cost																			
	Steelwork Vot. Demolition																			
	Rebar's Weight (variable steel)																			
	Truck's Capacity																			
	Hourly Rate																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Hourly Rate																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Drive																			
	Subtotal																			
	Equipment's Disposal Cost																			
	Demolition Cost																			
	Equipment's Vot. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Fence Demolition																			
	Subtotal																			
	Concrete Demolition																			
	Concrete Cost	Concrete Wall for Basins - 12" thick, reinforced	02-41-10-17-2000	1.87	CY	10	20	10				111			2	CY		220	CY	390
	Concrete Vot. Demolished																1.2			
	Loading Costs	Front End Loader 307	01-21-10-42-1000	2.21	CV													220	CV	480
	Transportation Costs	12 CY 110' Ford Dump Truck 102 vol. 100	01-21-22-20-1014	3.18	CV													220	CV	1081
	Disposal Costs	On Site Disposal	02-41-10-17-4200	11.40	CV													100	CV	2200
	Subtotal																			3340
	Total																			3340

INCORPORATED
 JAN 25 2018
 Div. of Oil, Gas & Mining

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	44 Access Road																				
	Structure's Demolition Cost																				
	Structure's Vol. Demolition																				
	Bubble's Weight (vacuate steel)																				
	Truck's Capacity																				
	Material																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Disposal Cost Non Steel																				
	Steel's Weight																				
	Truck's Capacity																				
	Material																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Drive																				
	Subtotal																				
	Equipment's Disposal Cost																				
	Dismantling Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Median Barrier	Median barrier, precast concrete, remove and store	02 41 13 30 5000	14.00 / LF		200															10640
	Subtotal																				10640
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				10640
	Total																				10640

INCORPORATED
 JAN 25 2018
 Div. of Oil, Gas & Mining

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	44 Concrete Trench Cuts																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolition																			
	Rubber's Weight (exclude steel)																			
	Truck's Capacity																			
	Hourage																			
	Transportation Cost Non Steel Truck																			
	Transportation Cost Non Steel Drive																			
	Disposal Cost Non Steel																			
	Steel's Weight																			
	Truck's Capacity																			
	Hourage																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Drive																			
	Subtotal																			
	Equipment's Disposal Cost																			
	Dismantling Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Concrete Demolition																			
	Walls					10	10	0.67				6								
	Walls					50	10	0.67				33								
	Floor					80	10	1				80								
	Concrete Cost	Concrete Wall/Floor Demo, 12" thick, <i>refers 02-41 18.17.2009</i>		1.57	CY															
	Concrete Vol. Demolished																			
	Loading Costs	Tract / Vol Loader 3CY		31.22	18.45	1200														153
	Transportation Costs	12 CY / 18' Long Dump Truck 102 mt. Trip		31.22	22.29	1014														268
	Disposal Costs	On Site Disposal		02-41 18.17.2009	11.42	CY														787
	Subtotal																			1280
	Total																			1280

INCORPORATED
 JAN 25 2018
 Div. of Oil, Gas & Mining

Item	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	48 Emergency Reclaim Feeder Gate																				
	Structure's Demolition Cost	Removal of steel plate - 121-600 ft	03 05 05 10 0000	68.00	EA														1 EA	68	
	Structure's Vol. Demolition																				
	Vehicle Weight (excelsior sheet)																				
	Truck's Capacity																				
	Hauling																				
	Transportation Cost Non Road Truck																				
	Transportation Cost Non Road Drive																				
	Disposal Cost Non Steel																				
	Stack's Weight																				
	Truck's Capacity																				
	Hauling																				
	Transportation & Disposal Cost Steel	Construction debris, off site haul and disposal	Scamp	6.00	Ton	9	3						30.4						0.00	Ton	1
	Transportation Cost Steel Drive																				
	Subtotal																				69
	Equipment's Disposal Cost																				
	Demolition Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Concrete Demolition																				
	Excavation																				
	Tube																				
	Concrete Cost																				
	Concrete Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Total																				69

INCORPORATED
 JAN 25 2018
 Div. of Oil, Gas & Mining

Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Scale Factor	Quantity	Unit	Cost			
	Mine Substation																						
	Structure's Reclamation Cost																						
	Structure's Vol. Demolition																						
	Structure's Weight (exclude steel)																						
	Truck's Capacity																						
	Materials																						
	Transportation Cost Non-Steel Truck																						
	Transportation Cost Non-Steel Drive																						
	Trucking Cost Non-Steel																						
	Truck's Weight																						
	Truck's Capacity																						
	Materials																						
	Transportation Cost Steel Truck																						
	Transportation Cost Steel Drive																						
	Subtotal																				0		
	Equipment's Demolition Cost	Demol of 4000 hp transformer, 3 ph, 220kV		22 65.05 16 19.70	1700	EA									2			2	EA	3400			
	Demolition Cost																						
	Equipment's Vol. Demolished																						
	Loading Costs	Hydraulic crane, 12 ton, with operator	Crane A-201	1518.58	Day														1	Day	1518		
	Transportation and Disposal Cost All	Demolition debris, off-site haul and disposal	Apron	8.00	Ton														2	Ton	16		
	Disposal Costs																						
	Subtotal																				4981		
	Fence Demolition	Chain-link fence, 8'-10" high		22 41 13.00 1700	4 44	FT														44	FT	2904	
	Subtotal																					2904	
	Concrete Demolition																						
	Concrete Cost	Concrete Floor Demolition, 8" thick, wet-laid		22 41 16.17 2470	1 11	SF	20	20	0.5											400	SF	651	
	Concrete Vol. Demolished																						
	Loading Costs	Front End Loader 30Y		22 22 18.00 1000	2 31	HR															8 62	HR	31
	Transportation Costs	12 CY 145 Tons Dump Truck 4 1/2 ton. Top		22 22 22.20 1014	3 24	CY															8 62	CY	31
	Disposal Costs	On Site Disposal		22 41 16.17 2470	11 60	CY																110	
	Subtotal																					611	
	Total																					4475	

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Ref.	Description	Materials	Mears Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	Paved Mine Road																				
	Structure's Demolition Cost																				
	Structure's Vial Demolition																				
	Rubble's Weight (exclusive steel)																				
	Truck's Capacity																				
	Headings																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Utility																				
	Disposal Cost Non Steel																				
	Steel's Weight																				
	Truck's Capacity																				
	Headings																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Utility																				
	Subtotal																				
	Equipment's Disposal Cost																				
	Demolition Cost																				
	Equipment's Vial Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Pavement Removal	Pavement Removal, Liberton, 4' to 8' P&A	02-41-13-17-5050	9.80/SY		1710	21	0.37		4200					BT			4587.5Y		43727	
	Disposal Costs	On Site Disposal	02-41-18-17-4200	11.40/SY								812			BT		1.3	692.5Y		7894	
	Subtotal																				51621
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vial Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Total																				53341

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	Culvert Demolition																				
DC-1	Excavation Bulk Bank 2 CY (322BL)		31 23 16 42 0200	1.81	CY	60	1.5	3								FT		10	CY	18	
DC-2	Excavation Bulk Bank 2 CY (322BL)		31 23 16 42 0200	1.81	CY	60	1.5	3								FT		10	CY	18	
DC-3	Excavation Bulk Bank 2 CY (322BL)		31 23 16 42 0200	1.81	CY	75	1.5	3								FT		11	CY	20	
DC-4	Excavation Bulk Bank 2 CY (322BL)		31 23 16 42 0200	1.81	CY	450	2	3								FT		83	CY	151	
DC-5	Excavation Bulk Bank 2 CY (322BL)		31 23 16 42 0200	1.81	CY	350	2	3								FT		78	CY	141	
DC-6	Excavation Bulk Bank 2 CY (322BL)		31 23 16 42 0200	1.81	CY	107	2	3								FT		24	CY	43	
DC-7	Excavation Bulk Bank 2 CY (322BL)		31 23 16 42 0200	1.81	CY	155	2	3								FT		34	CY	62	
DC-8	Excavation Bulk Bank 2 CY (322BL)		31 23 16 42 0200	1.81	CY	187	2	3								FT		37	CY	67	
DC-9	Excavation Bulk Bank 2 CY (322BL)		31 23 16 42 0200	1.81	CY	186	2	3								FT		41	CY	75	
DC-10	Excavation Bulk Bank 2 CY (322BL)		31 23 16 42 0200	1.81	CY	60	2	3								FT		19	CY	34	
DC-11	Excavation Bulk Bank 2 CY (322BL)		31 23 16 42 0200	1.81	CY	101	2	3								FT		23	CY	41	
DC-12a	Excavation Bulk Bank 2 CY (322BL)		31 23 16 42 0200	1.81	CY	149	2.5	3.5								FT		45	CY	82	
DC-12b	Excavation Bulk Bank 2 CY (322BL)		31 23 16 42 0200	1.81	CY	79	2.5	3								FT		22	CY	40	
DC-12c	Excavation Bulk Bank 2 CY (322BL)		31 23 16 42 0200	1.81	CY	307	2.5	3								FT		99	CY	178	
DC-13a	Excavation Bulk Bank 2 CY (322BL)		31 23 16 42 0200	1.81	CY	8	2.5	3.5								FT		3	CY	5	
DC-13	PREVIOUSLY REMOVED																				
DC-14	Excavation Bulk Bank 2 CY (322BL)		31 23 16 42 0200	1.81	CY	40	1.5	3								FT		7	CY	12	
DC-15	Excavation Bulk Bank 2 CY (322BL)		31 23 16 42 0200	1.81	CY	45	1.5	3								FT		9	CY	14	
DC-16	Excavation Bulk Bank 2 CY (322BL)		31 23 16 42 0200	1.81	CY	25	1.5	3								FT		4	CY	8	
DC-17	Excavation Bulk Bank 2 CY (322BL)		31 23 16 42 0200	1.81	CY	120	1.5	3								FT		20	CY	36	
DC-18	Excavation Bulk Bank 2 CY (322BL)		31 23 16 42 0200	1.81	CY	27	1.5	3								FT		4	CY	8	
UC-1	Excavation Bulk Bank 2 CY (322BL)		31 23 16 42 0200	1.81	CY	120	5	6								FT		133	CY	241	
UC-1a	Excavation Bulk Bank 2 CY (322BL)		31 23 16 42 0200	1.81	CY	300	5	6								FT		400	CY	724	
	Subtotal																				
	Equipment Disposal Cost																				
	Dismantling Cost																				
	Equipment Vol Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Disposal Costs																				
	Subtotal																				
	Demolition Cost 18" CMP																				
	Demolition, CMP pipe, steel, 18"		02 41 13 40 0160	3.90	LF			402						15	buft	FT		402	FT	1508	
	Demolition Cost 24" CMP		02 41 13 40 0170	14.70	LF			2151						19	buft	FT		2151	FT	31620	
	Demolition Cost 60" CMP		02 41 13 40 0195	22.00	LF			480						103	buft	FT		480	FT	10560	
	Concrete Vol Demolished																				
	Loading Costs																				
	Transportation & Disposal Costs																				
	Demolition debris, off-site haul and disposal																				
			Scamp	0.00	Ton							60339	lb					48	Tons	288	
	Disposal Costs																				
	Subtotal																				
	Total																				

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost
	Liba Old Fan Portals																			
	Structure's Demolition Cost																			
	Structure's Vol. Demolition																			
	Structure's Weight (excludes steel)																			
	Truck's Capacity																			
	Halfday																			
	Transportation Cost Non-Steel Truck																			
	Transportation Cost Non-Steel Drive																			
	Disposal Cost Non-Steel																			
	Structure's Weight																			
	Truck's Capacity																			
	Halfday																			
	Transportation Cost Steel Truck																			
	Transportation Cost Steel Drive																			
	Subtotal																			
	Old Horse Canyon Liba Fan Portals																			
	Equipment's Disposal Cost																			
	Demolition Cost																			
	Equipment's Vol. Demolished																			
	Loading Costs																			
	Transportation and Disposal Cost All																			
	Disposal Costs																			
	Subtotal																			
	Total																			
	Final Sealbox																			
	Seal Construction	Seal ports, materials	Jans'2006	\$220.00/EA												2 EA			2 EA	\$440
	Labor	Seal ports, labor	Jans'2006	200.00/HR												8 HR			8 HR	\$1,600
	Site Acquisition	Final seal, site acquisition prep	Class B-1	1,800.00/Day												2 Days			2 Days	\$3,600
	Block retaining walls	Block wall reinforced, 4' thick (2 each wall)	04.22.10.24.1100	8.50/SF			20	8.0		344								688 SF	5,840	
	Subtotal																			\$1,080
	Concrete Demolition																			
	Concrete Cost																			
	Concrete Vol. Demolished																			
	Loading Costs																			
	Transportation Costs																			
	Disposal Costs																			
	Subtotal																			
	Total																			\$1,080

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Ref.	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quant/Unit	Unit	Cost			
	Steel Demolition																						
	Structure's Demolition Cost	Building Demolition - Steel	02-41 16 13 0020	0.27	CF		20	30	8								FT	4800	CF	1290			
	Structure's Demolition Cost	Building Demolition - Steel	02-41 16 13 0020	0.27	CF		40	50	8								FT	3200	CF	661			
	Truck's Capacity																						
	Truck's Capacity																						
	Transportation Cost Non Steel Truck																						
	Transportation Cost Non Steel Drive																						
	Disposal Cost Non Steel																						
	Steel's Weight																						
	Truck's Capacity																						
	Hauling																						
	Transportation & Disposal Cost Steel	Demolition debris, off site haul and disposal	Scamp	0.00	Ton								450					8	CY	71	Ton	420	
	Transportation Cost Steel Drive																						
	Subtotal																					2550	
	Equipment's Disposal Cost																						
	Dismantling Cost																						
	Equipment's Wtd. Demolished	Mechanical Equipment Demolition, Heavy	23-69 05 19 3020	1225.00	Ton																		
	Loading Costs																						
	Transportation & Disposal Cost Steel	Demolition debris, off site haul and disposal	Scamp	0.00	Ton																		
	Disposal Costs																						
	Subtotal																						3070
	Concrete Demolition																						
	Concrete Cost																						
	Concrete Vol. Demolished																						
	Loading Costs																						
	Transportation Costs																						
	Disposal Costs																						
	Subtotal																						
	Concrete Demolition																						
	Concrete Cost	Concrete Wall/Floor Down, 12" thick, reinforced	02-41 16 17 2090	1.57	CY		4	6	6.0														
	Concrete Vol. Demolished																						
	Loading Costs	Front End Loader 3CY	31-23 18 42 3300	2.31	CY																		
	Transportation Costs	12 CY (10 Ton) Dump Truck 102 mi. Trip	31-22 20 3014	3.74	CY																		
	Disposal Costs	On Site Disposal	02-41 16 17 4000	11.40	CY																		
	Subtotal																						18
	Total																						3270

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Item	Description	Materials	Means Reference Number	Unit Cost	Unit	Length	Width	Height	Diameter	Area	Volume	Weight	Density	Time	Number	Unit	Swell Factor	Quantity	Unit	Cost	
	Discs Blue																				
	Structure's Demolition Cost																				
	Structure's Vol. Demolition																				
	Structure's Weight (excluding steel)																				
	Truck's Capacity																				
	Hourly Rate																				
	Transportation Cost Non Steel Truck																				
	Transportation Cost Non Steel Drive																				
	Discost Cost Non Steel																				
	Steel's Weight																				
	Truck's Capacity																				
	Hourly Rate																				
	Transportation Cost Steel Truck																				
	Transportation Cost Steel Drive																				
	Subtotal																				
	Equipment's Discost Cost																				
	Demolition Cost																				
	Equipment's Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Discost Costs																				
	Subtotal																				
	Concrete Demolition																				
	Footings																				
	Structures	Concrete Wall Two Floors, 12" Thick, reinforced	02-41 18.17.2000	1.52	CY	2	3	3.44			2									2	3
	Concrete Cost	Concrete Wall Four Floors, 12" Thick, reinforced	02-41 18.17.2000	1.52	CY	4	4	1.5			4									4	6
	Concrete Vol. Demolished																			1.2	8.52
	Loading Costs	Front End Loader 2CY	31-23 19.42.1000	2.24	CY																18
	Transportation Costs	12 CY 418 Tonn Capacity Truck 112 mph. Top	21-23 23.29.1014	2.28	CY																20
	Discost Costs	On-Site Discost	02-41 18.17.2000	11.40	CY																61
	Subtotal																				145
	Concrete Demolition																				
	Concrete Cost																				
	Concrete Vol. Demolished																				
	Loading Costs																				
	Transportation Costs																				
	Discost Costs																				
	Subtotal																				
	Total																				145

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Lila Canyon Mine Reclamation Bond Estimate
Earthwork Costs

Description	Quantity	Units	Production Rate	Units	Production Time	Units	Materials/Equipment/Labor	Cost Reference BSMeans Ref #	Unit Cost	Units	Quantity	Cost
Mine Site Earthwork Estimate												
Load and Haul Backfill												
631G (9-51)(2nd04)	43783	CY	393	CY/HR	111.4	HR	Self-propelled scraper, 34 CY, 500 HP	Crew B-33K	418.20	HR	111.4	\$46,587
Spread, Compact, and Scarify Backfill												
D8, Track-mounted	43783	CY	1850	CY/Day	23.7	Day	Dozer, 300 HP, 50' haul, sandy clay and loam	Crew B-10M	2978.00	Day	23.7	\$70,579
R25G (6-13)(4Q03)	43783	CY	4100	CY/Day	10.7	Day	Sheepsfoot roller, 315 HP, 8' lifts, 2 passes	Crew B-10G	2313.60	Day	10.7	\$24,756
Scarify subsoil	28.70	ac	240	MSF/Day	5.2	Day	75 HP Dozer with scarifier	32 91 13.23 3100	5.85	MSF	1250	\$7,313
Backfill, Grade, and Scarify Upper Road Area												
770 (20-11)(3Q03)	5000	CY	882	CY/Day	5.7	Day	Off-highway rear dump truck, 40 ton, 10 MPH	Crew B-34F	2234.80	Day	5.7	\$12,738
988G EROPS (9-38)(3Q04)	5000	CY	1480	CY/Day	3.4	Day	Loader, 500 HP, wheel mounted, 5 CY cap	Crew B-14A	4306.40	Day	3.4	\$14,642
D8, Track-mounted	5000	CY	1850	CY/Day	2.7	Day	Dozer, 300 HP, 50' haul, sandy clay and loam	Crew B-10M	2978.00	Day	2.7	\$8,041
Scarify subsoil	4.24	ac	240	MSF/Day	0.8	Day	75 HP Dozer with scarifier	32 91 13.23 3100	5.85	MSF	185	\$1,082
Load, Haul, and Spread Topsoil - Main Area												
631G (9-51)(2nd04)	81088	CY	393	CY/HR	155.4	HR	Self-propelled scraper, 34 CY, 500 HP	Crew B-33K	418.20	HR	155.4	\$64,988
D9R Semi-U EROPS (9-54)(2H04)	81088	CY	1850	CY/Day	33	Day	Dozer, 300 HP, 50' haul, sandy clay and loam	Crew B-10M	2978.00	Day	33	\$98,274
Load, Haul, and Spread Topsoil - Upper Road Area												
770 (20-11)(3Q03)	10000	CY	882	CY/Day	11.3	Day	Off-highway rear dump truck, 40 ton, 10 MPH	Crew B-34F	2234.80	Day	11.3	\$25,253
988G EROPS (9-38)(3Q04)	10000	CY	1480	CY/Day	6.8	Day	Loader, 500 HP, wheel mounted, 5 CY cap	Crew B-14A	4306.40	Day	6.8	\$29,284
D8, Track-mounted	10000	CY	1850	CY/Day	5.4	Day	Dozer, 300 HP, 50' haul, sandy clay and loam	Crew B-10M	2978.00	Day	5.4	\$16,081
Support												
Water Truck							5000 gallon water truck	Crew B-9A	2041.01	Day	16.0	\$32,658
Subtotal												\$452,273

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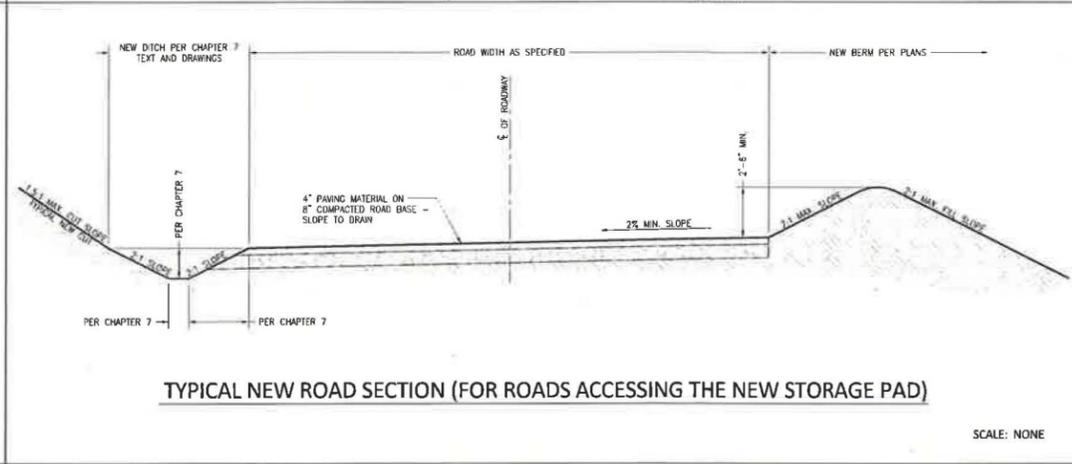
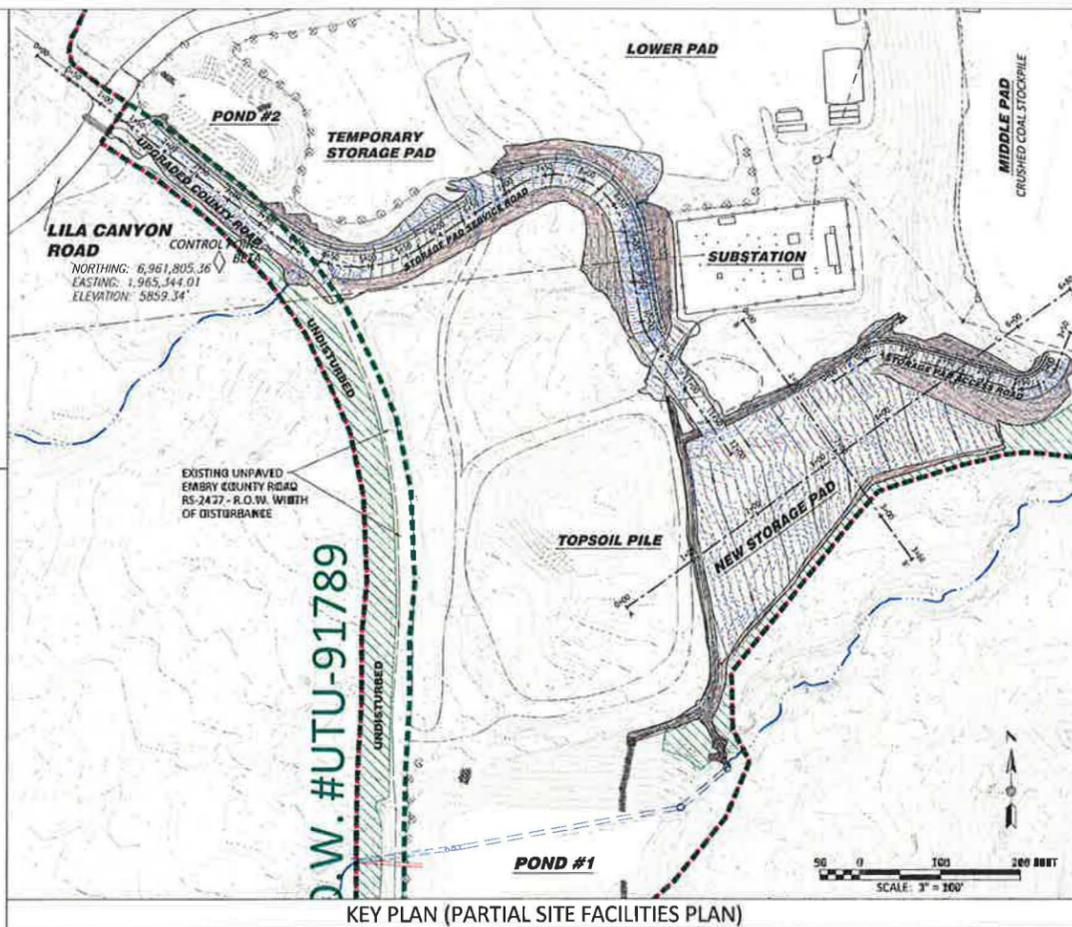
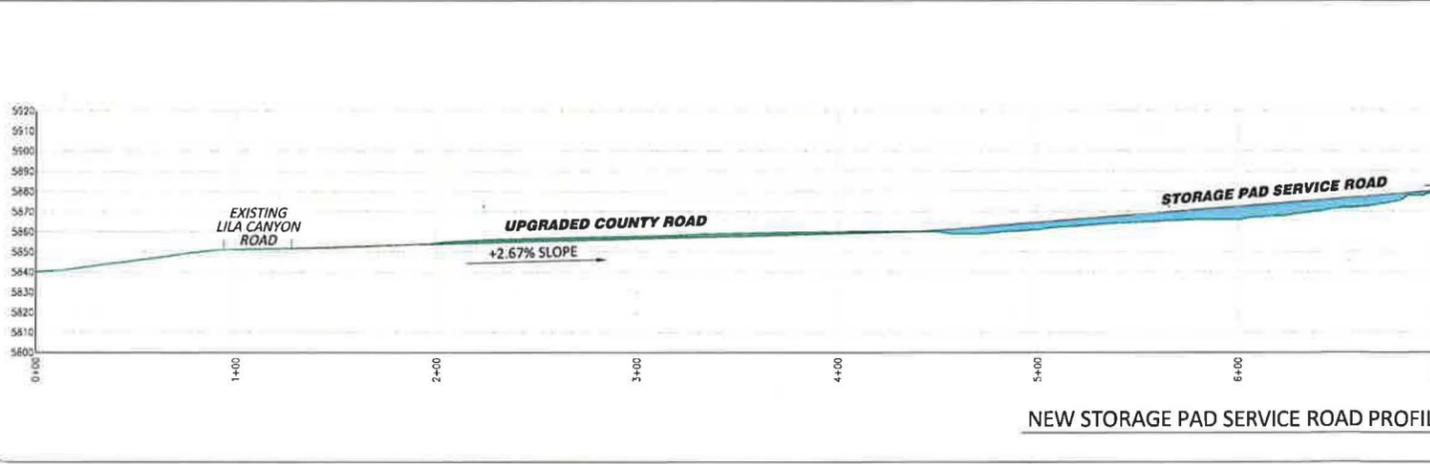
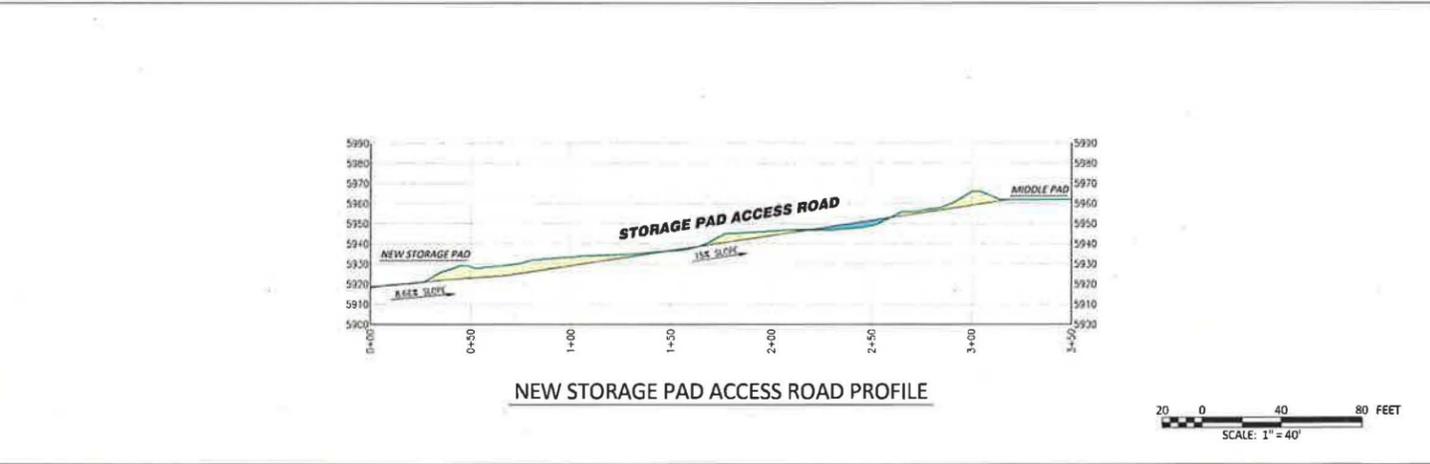
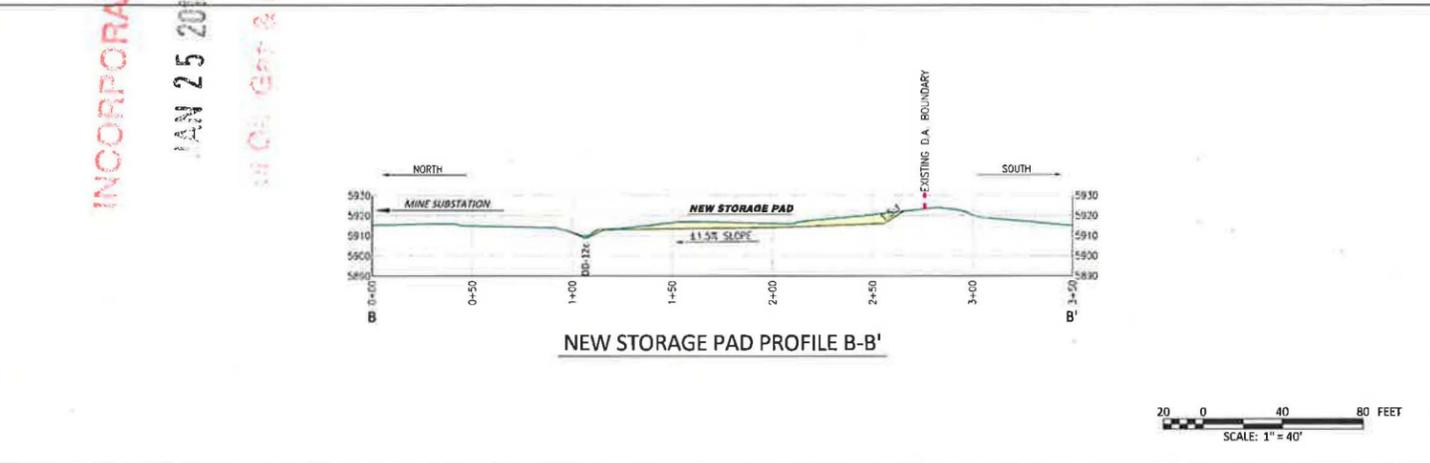
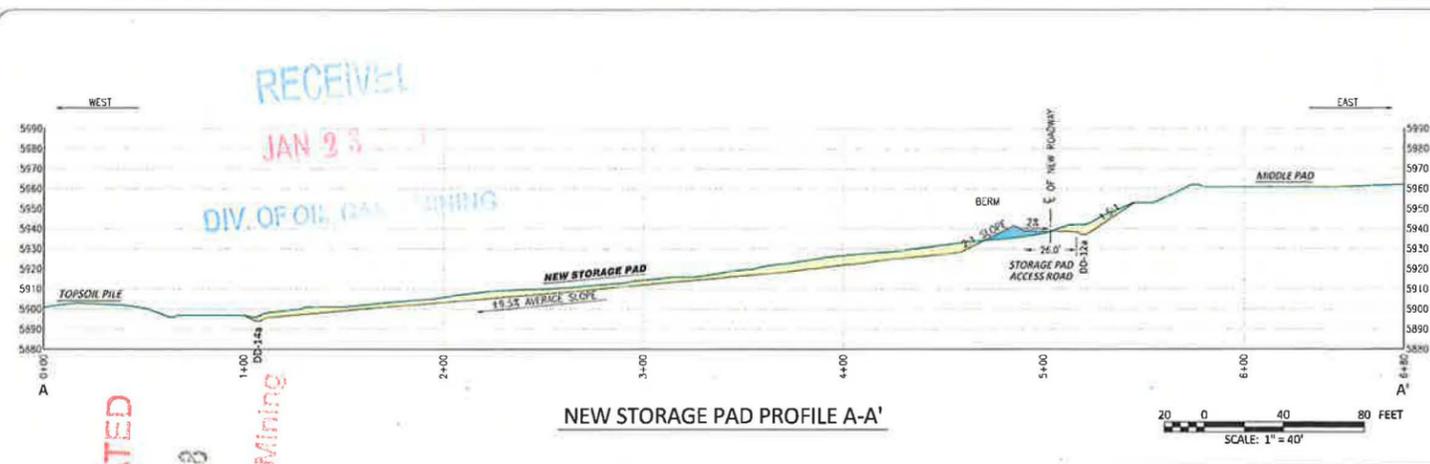
Lila Canyon Mine Reclamation Bond Estimate
Revegetation Costs

Item	Description	Material	Mount Reference Number	Unit	Unit Cost	Quantity	Volume	Weight	Density	Rate	Number	Unit	Weight Factor	Quantity	Unit	Cost		
Mine Site Revegetation Estimate																		
<i>Ground Preparation</i>																		
	Packing	Excavation Bulk Bank 2 CY (322BL)		31 23	16.42	0260	1.81	CY		37.02	ac		340	CY/ac		12586.8	CY	22782
<i>Site Revegetation</i>																		
	Mulch Material, Labor, and Equipment	Power mulcher, large, hay 1" deep		32 91	13.16	0320	30.80	MSF		37.02			ac		1013	MSF	40197	
	Seeding Material	Lila Canyon Seed Mix (see below)		Great Basin Seed	155.80	ac				37.02			ac		37.00	AC	6764	
	Seeding Equipment and Labor	Hydroseeder (equipment and labor only)		32 92	19.14	4800	22.00	MSF		37.02			ac		1013	MSF	35486	
	Fertilizer equipment, materials, & labor	Fertilizer, hydro spread, 1.5 lb/MSF		32 01	90.13	0180	5.00	MSF		37.02			ac		1013	MSF	8065	
	Subtotal:																	121,294
	Mine Site																	30324
	Re-revegetate 25% of area																	10,428
	Subtotal:																	151,614
	Total																	151,614

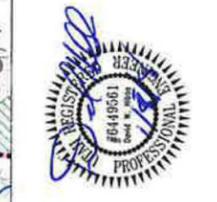
Seed mix cost based on the application rates provided in Table 3.4/3.5 of the MRP
Seed prices downloaded October 2017 from greatbasinseed.com

Common Name	Seeding Rate (lb PLS/ac)	Unit Cost (\$/lb)	Mix Cost (\$/ac)
Grasses			
Needle and Thread	2.00	39.5	79.00
Indian Ricegrass	2.00	8.95	17.90
Basin Wild Rye	1.00	16.95	16.95
Galleta	1.00	24.00	24.00
Bluebunch Wheatgrass	1.00	8.95	8.95
Slender Wheatgrass	2.00	2.95	5.90
Blue Gramma	1.00	16.00	16.00
Forbs			
Blue Flax	1.00	8.75	8.75
Palmer penstemon	0.25	10.00	2.50
Globeamallow	0.50	59.00	29.50
Indian Paintbrush	0.10	150.00	15.00
Fringed Sage	0.10	18.00	1.80
Shrubs			
Wyoming Big Sage	0.25	9.50	2.38
Green Rabbitbrush	0.10	18.00	1.80
Fourwing Saltbush	0.84	13.00	10.92
Winterfat	1.00	18.00	18.00
Shadscale	1.00	9.00	9.00
Chifrose	1.00	36.00	36.00
Black Sage	0.25	15.99	3.99
		Subtotal =	141.63
		10% increase to account for PLS requirement =	14.16
		Seed mix unit cost =	155.80

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LILA CANYON MINE
NEW STORAGE PAD AND ROADS
PLANS AND PROFILES
NOVEMBER 2016
P. JENSEN
AS SHOWN 5-70-1

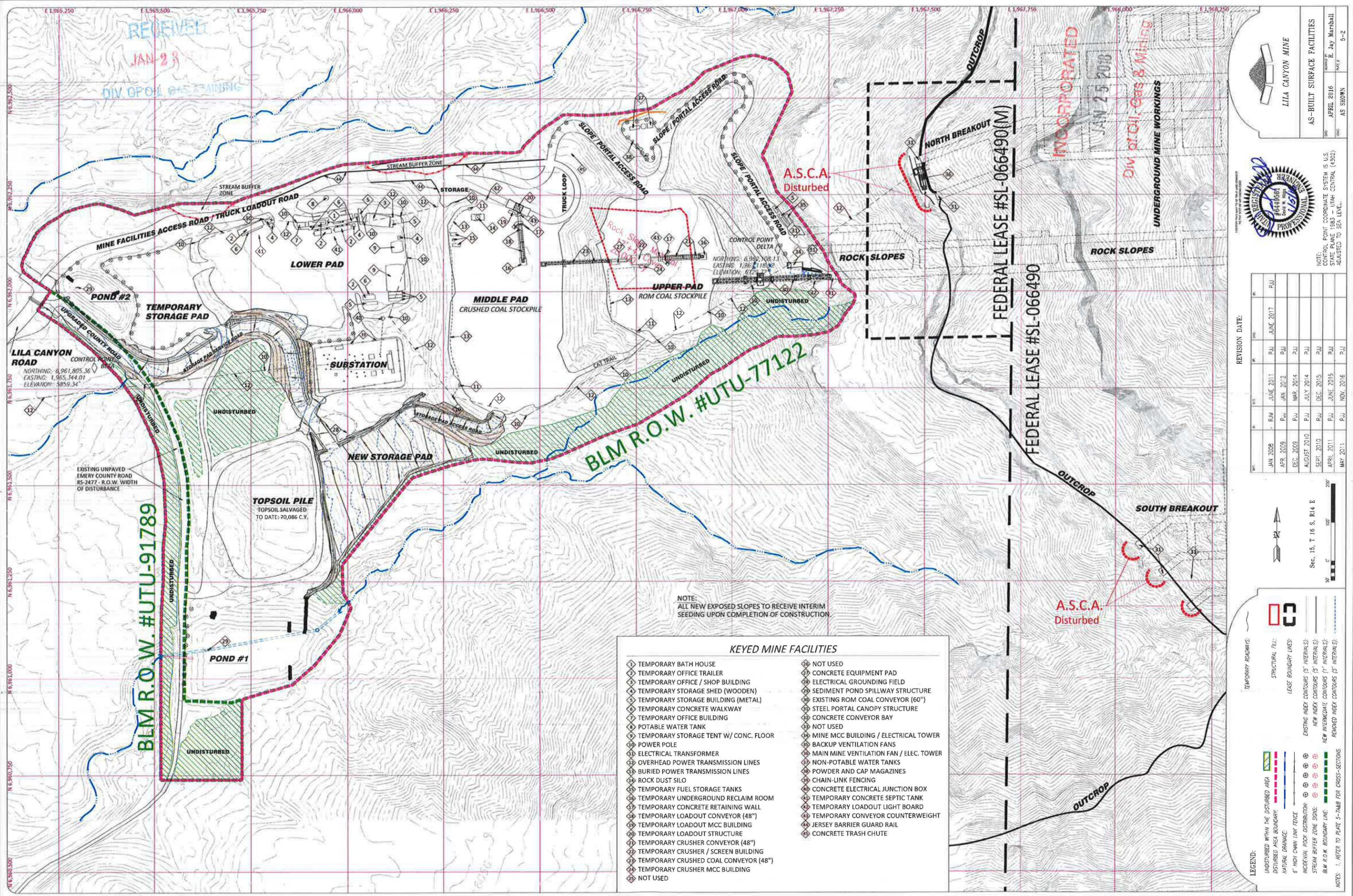


REVISION DATE:

NOV. 2016	PJJ
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- LEGEND:
- EXISTING PROFILE
 - WORKING PROFILE
 - EXISTING DISTURBED AREA BOUNDARY
 - PROPOSED BLM RIGHT-OF-WAY LINE
 - CUT AREA
 - FILL AREA

NOTES:
1. NEW FILL AREAS TO HAVE A MAXIMUM SLOPE OF 2 HORIZONTAL UNITS TO 1 VERTICAL UNIT UNLESS OTHERWISE NOTED.
2. ALL NEW CUT AREAS TO HAVE A MAXIMUM SLOPE OF 1.5 HORIZONTAL UNITS TO 1 VERTICAL UNIT UNLESS OTHERWISE NOTED.



RECEIVED
JAN 23
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JAN 25 2018
DIV OF OIL, GAS & MINING
UNDERGROUND MINE WORKINGS

LILA CANYON ROAD
CONTROL POINT
NORTHING: 6,961,805.36
EASTING: 1,965,344.01
ELEVATION: 5859.34'

NOTE:
ALL NEW EXPOSED SLOPES TO RECEIVE INTERIM SEEDING UPON COMPLETION OF CONSTRUCTION

KEYED MINE FACILITIES

- | | |
|---|---|
| ◇ TEMPORARY BATH HOUSE | ◇ NOT USED |
| ◇ TEMPORARY OFFICE TRAILER | ◇ CONCRETE EQUIPMENT PAD |
| ◇ TEMPORARY OFFICE / SHOP BUILDING | ◇ ELECTRICAL GROUNDING FIELD |
| ◇ TEMPORARY STORAGE SHED (WOODEN) | ◇ SEDIMENT POND SPILLWAY STRUCTURE |
| ◇ TEMPORARY STORAGE BUILDING (METAL) | ◇ EXISTING ROM COAL CONVEYOR (60") |
| ◇ TEMPORARY CONCRETE WALKWAY | ◇ STEEL PORTAL CANOPY STRUCTURE |
| ◇ TEMPORARY OFFICE BUILDING | ◇ CONCRETE CONVEYOR BAY |
| ◇ POTABLE WATER TANK | ◇ NOT USED |
| ◇ TEMPORARY STORAGE TENT W/ CONC. FLOOR | ◇ MINE MCC BUILDING / ELECTRICAL TOWER |
| ◇ POWER POLE | ◇ BACKUP VENTILATION FANS |
| ◇ ELECTRICAL TRANSFORMER | ◇ MAIN MINE VENTILATION FAN / ELEC. TOWER |
| ◇ OVERHEAD POWER TRANSMISSION LINES | ◇ NON-POTABLE WATER TANKS |
| ◇ BURIED POWER TRANSMISSION LINES | ◇ POWDER AND CAP MAGAZINES |
| ◇ ROCK DUST SILO | ◇ CHAIN-LINK FENCING |
| ◇ TEMPORARY FUEL STORAGE TANKS | ◇ CONCRETE ELECTRICAL JUNCTION BOX |
| ◇ TEMPORARY UNDERGROUND RECLAIM ROOM | ◇ TEMPORARY CONCRETE SEPTIC TANK |
| ◇ TEMPORARY CONCRETE RETAINING WALL | ◇ TEMPORARY LOADOUT LIGHT BOARD |
| ◇ TEMPORARY LOADOUT CONVEYOR (48") | ◇ TEMPORARY CONVEYOR COUNTERWEIGHT |
| ◇ TEMPORARY LOADOUT MCC BUILDING | ◇ JERSEY BARRIER GUARD RAIL |
| ◇ TEMPORARY LOADOUT STRUCTURE | ◇ CONCRETE TRASH CHUTE |
| ◇ TEMPORARY CRUSHER CONVEYOR (48") | |
| ◇ TEMPORARY CRUSHER / SCREEN BUILDING | |
| ◇ TEMPORARY CRUSHED COAL CONVEYOR (48") | |
| ◇ TEMPORARY CRUSHER MCC BUILDING | |
| ◇ NOT USED | |

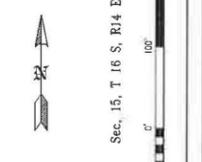
LILA CANYON MINE
AS-BUILT SURFACE FACILITIES
DATE: APRIL 2016
DRAWN BY: R. Jay Marshall
SCALE: AS SHOWN
PAGE: 5-2



NOTE:
CONTROL POINT COORDINATE SYSTEM IS U.S. STATE PLANE 1983 - UTAH CENTRAL (4302) ADJUSTED TO SEA LEVEL.

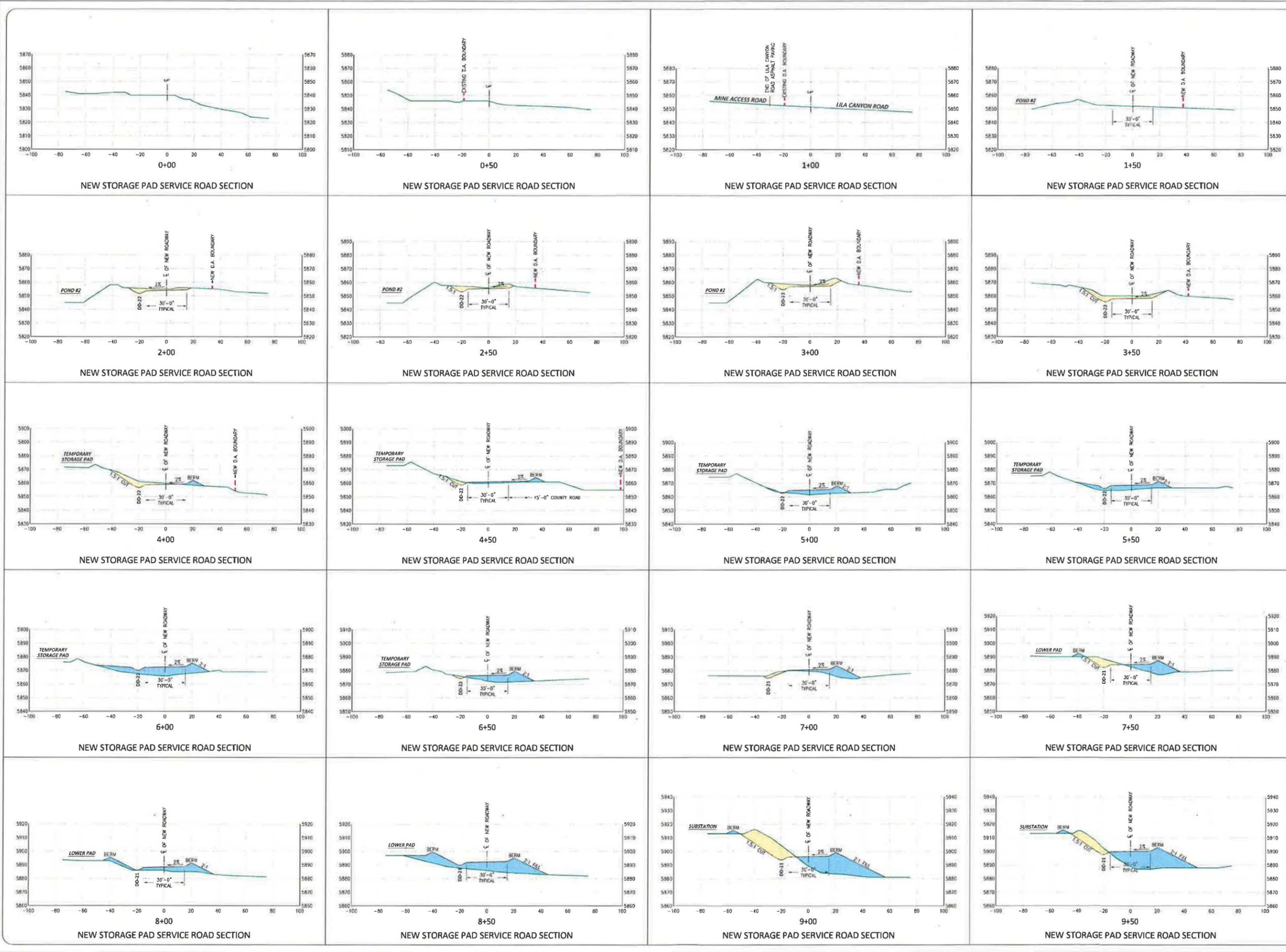
REVISION DATE:

NO.	DATE	BY	DESCRIPTION
1	JAN 2008	RJM	PLU
2	APR 2009	RJM	PLU
3	DEC 2009	RJM	PLU
4	AUGUST 2010	RJM	PLU
5	SEPT 2010	RJM	PLU
6	APRIL 2011	RJM	PLU
7	MAY 2011	RJM	PLU
8	JUNE 2011	RJM	PLU
9	JULY 2014	RJM	PLU
10	MAR 2014	RJM	PLU
11	JAN 2012	RJM	PLU
12	JUNE 2011	RJM	PLU
13	JUNE 2017	RJM	PLU



LEGEND:

- UNDISTURBED WITHIN THE DISTURBED AREA
- DISTURBED AREA BOUNDARY
- NATURAL DRAINAGE
- 6" HIGH CHAIN LINK FENCE
- INCORPORATED ROCK DISTRIBUTION
- STREAM BUFFER ZONE SIGNS
- BLM R.O.W. BOUNDARY LINE
- TEMPORARY ROADWAYS
- STRUCTURAL FILL
- LEASE BOUNDARY LINES
- EXISTING INDEX CONTOURS (5' INTERVALS)
- NEW INDEX CONTOURS (5' INTERVALS)
- NEW INTERMEDIATE CONTOURS (1' INTERVALS)
- REMOVED INDEX CONTOURS (5' INTERVALS)
- REFER TO PLATE 5-744B FOR CROSS-SECTIONS



LILA CANYON MINE

NEW STORAGE PAD AND ROADS
ROAD SECTIONS

NOVEMBER 2016
AS SHOWN

P. JENSEN
5-70-2



REVISION DATE:

NO.	DATE	BY	DESCRIPTION
1	NOV. 2016	PJ	

INCORPORATED

JAN 25 2018

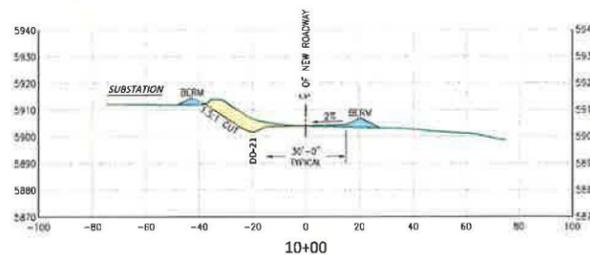
NOTES:
 1. ALL NEW FILL AREAS TO HAVE A MAXIMUM SLOPE OF 2 HORIZONTAL UNITS TO 1 VERTICAL UNIT UNLESS OTHERWISE NOTED.
 2. ALL NEW CUT AREAS TO HAVE A MAXIMUM SLOPE OF 1.5 HORIZONTAL UNITS TO 1 VERTICAL UNIT UNLESS OTHERWISE NOTED.



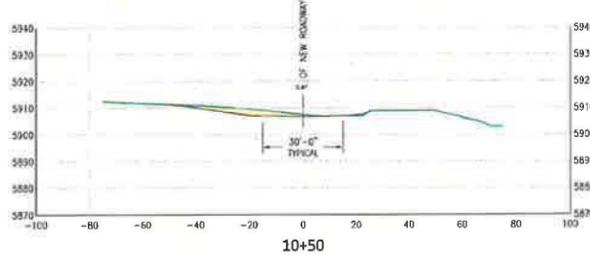
LEGEND:

- EXISTING PROFILE
- WORKING PROFILE
- - - EXISTING DISTURBED AREA BOUNDARY
- - - PROPOSED BLM RIGHT-OF-WAY LINE
- CUT AREA
- FILL AREA

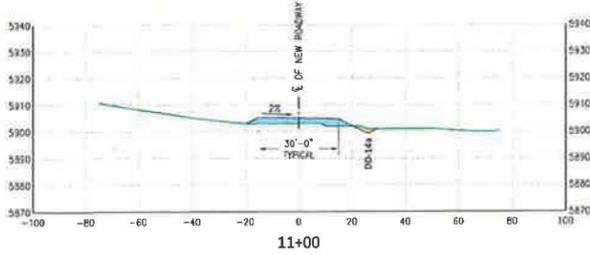
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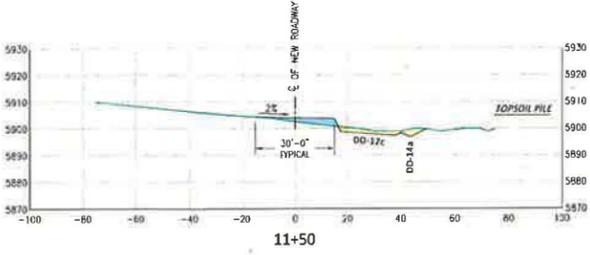
NEW STORAGE PAD SERVICE ROAD SECTION



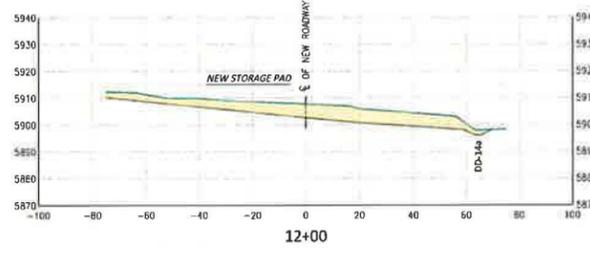
NEW STORAGE PAD SERVICE ROAD SECTION



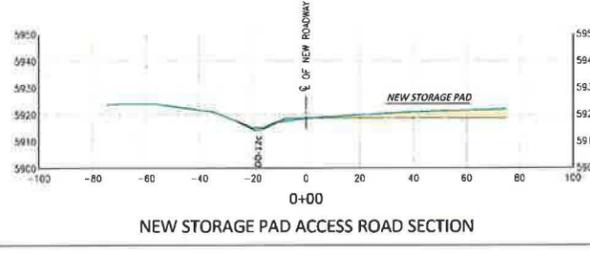
NEW STORAGE PAD SERVICE ROAD SECTION



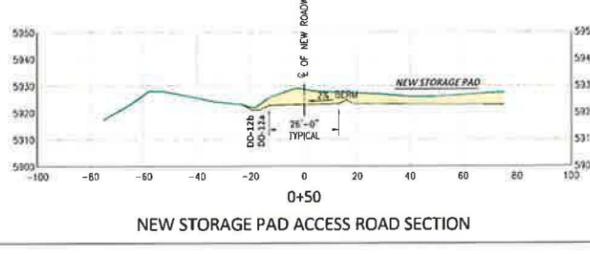
NEW STORAGE PAD SERVICE ROAD SECTION



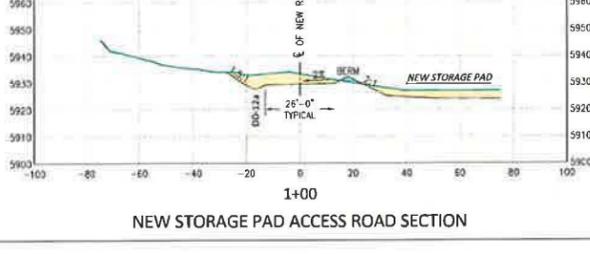
NEW STORAGE PAD SERVICE ROAD SECTION



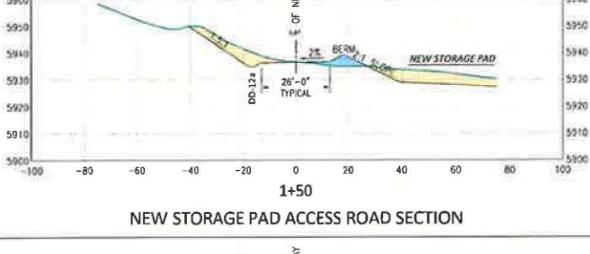
NEW STORAGE PAD ACCESS ROAD SECTION



NEW STORAGE PAD ACCESS ROAD SECTION



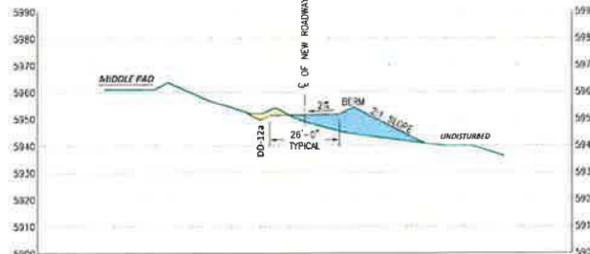
NEW STORAGE PAD ACCESS ROAD SECTION



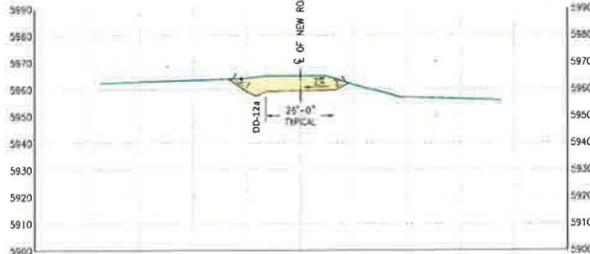
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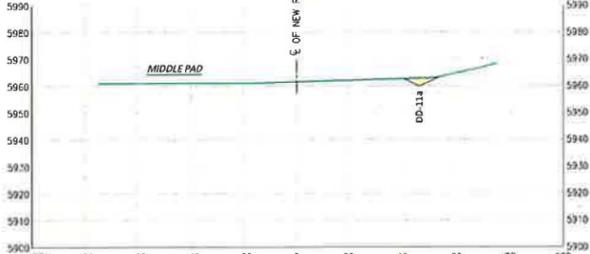
NEW STORAGE PAD ACCESS ROAD SECTION



NEW STORAGE PAD ACCESS ROAD SECTION



NEW STORAGE PAD ACCESS ROAD SECTION



NEW STORAGE PAD ACCESS ROAD SECTION

LILA CANYON MINE
NEW STORAGE PAD AND ROADS
ROAD SECTIONS
NOVEMBER 2016
P. JENSEN
AS SHOWN 5-7D-3



INCORPORATED

JAN 25 2018

Div. of Oil, Gas & Mining

REVISION DATE:

NOV. 2015	PJJ



- NOTES
1. ALL NEW FILL AREAS TO HAVE A MAXIMUM SLOPE OF 2 HORIZONTAL UNITS TO 1 VERTICAL UNIT UNLESS OTHERWISE NOTED.
 2. ALL NEW CUT AREAS TO HAVE A MAXIMUM SLOPE OF 1.5 HORIZONTAL UNITS TO 1 VERTICAL UNIT UNLESS OTHERWISE NOTED.

LEGEND:

- EXISTING PROFILE
- WORKING PROFILE
- EXISTING DISTURBED AREA BOUNDARY
- PROPOSED BLM RIGHT-OF-WAY LINE
- CUT AREA
- FILL AREA

INCORPORATED

JAN 25 2018

Div. of Oil, Gas & Mining

NOTE: "UNDISTURBED" DENOTES DRAINAGE AND IS NOT APPLICABLE TO SOILS.



| REVISION DATE: |
|----------------|----------------|----------------|----------------|----------------|----------------|
| JAN 2008 | APR 2008 | JUL 2008 | JUN 2009 | JAN 2010 | Dec. 2013 |
| RJM | TJS | TJS | TJS | TJS | PUJ |
| Aug. 2014 | Dec. 2015 | JUNE 2016 | NOV. 2016 | JUNE 2017 | Nov. 2013 |
| PUJ | PUJ | PUJ | PUJ | PUJ | PUJ |

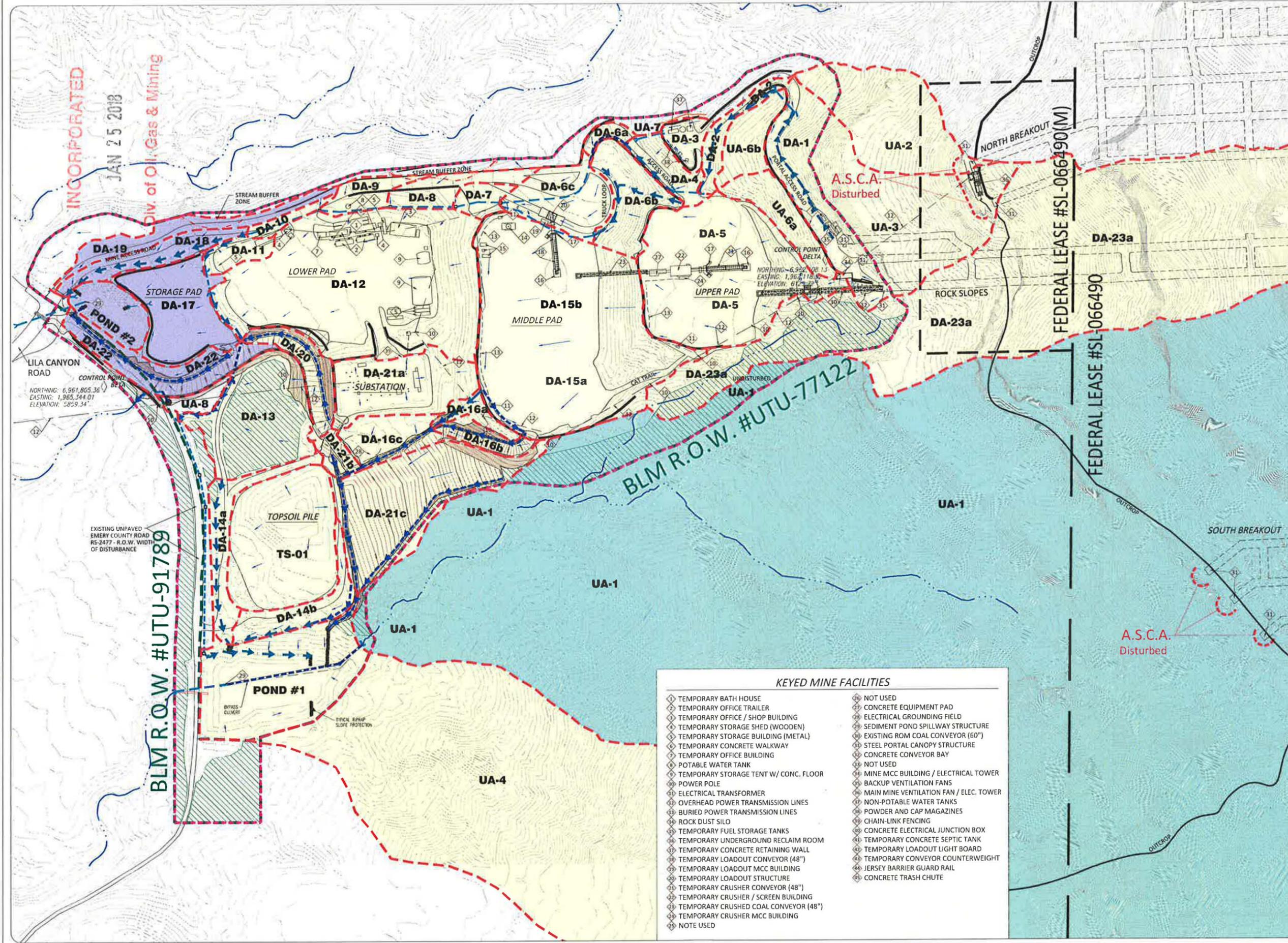


LEGEND:

- UNDISTURBED WITHIN THE DISTURBED AREA
- DISTURBED AREA BOUNDARY
- NATURAL DRAINAGE
- TEMPORARY ROADWAYS
- BLM R.O.W. BOUNDARY LINES
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- NEW DRAIN BOX
- 6" HIGH CHAIN LINK FENCE
- DRAINAGE REPORTING TO POND #1
- DRAINAGE REPORTING TO POND #2
- DRAINAGE BYPASSING POND #1
- UNDISTURBED DRAINAGE
- UNSHADED

ANGIOCTAL ROCK DISTRIBUTION:

- Stream Buffer Zone
- MS Area Boundary
- Existing Ditch
- New Berried Culvert
- Existing Berried Culvert



KEYED MINE FACILITIES

◇ TEMPORARY BATH HOUSE	◇ NOT USED
◇ TEMPORARY OFFICE TRAILER	◇ CONCRETE EQUIPMENT PAD
◇ TEMPORARY OFFICE / SHOP BUILDING	◇ ELECTRICAL GROUNDING FIELD
◇ TEMPORARY STORAGE SHED (WOODEN)	◇ SEDIMENT POND SPILLWAY STRUCTURE
◇ TEMPORARY STORAGE BUILDING (METAL)	◇ EXISTING ROM COAL CONVEYOR (60")
◇ TEMPORARY CONCRETE WALKWAY	◇ STEEL PORTAL CANOPY STRUCTURE
◇ TEMPORARY OFFICE BUILDING	◇ CONCRETE CONVEYOR BAY
◇ POTABLE WATER TANK	◇ NOT USED
◇ TEMPORARY STORAGE TENT W/ CONC. FLOOR	◇ MINE MCC BUILDING / ELECTRICAL TOWER
◇ POWER POLE	◇ BACKUP VENTILATION FANS
◇ ELECTRICAL TRANSFORMER	◇ MAIN MINE VENTILATION FAN / ELEC. TOWER
◇ OVERHEAD POWER TRANSMISSION LINES	◇ NON-POTABLE WATER TANKS
◇ BURIED POWER TRANSMISSION LINES	◇ POWDER AND CAP MAGAZINES
◇ ROCK DUST SILO	◇ CHAIN-LINK FENCING
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◇ NOTE USED	

BLM R.O.W. #UTU-91789

BLM R.O.W. #UTU-77122

FEDERAL LEASE #SL-066490(M)

FEDERAL LEASE #SL-066490

NORTHING: 5,961,805.36
EASTING: 1,965,344.01
ELEVATION: 5859.34'

EXISTING UNPAVED EMERY COUNTY ROAD RS-2477 - R.O.W. WIDTH OF DISTURBANCE

A.S.C.A. Disturbed

A.S.C.A. Disturbed

INCORPORATED

JAN 25 2018

Div. of Oil, Gas & Mining

NOTE: "UNDISTURBED" DENOTES DRAINAGE AND IS NOT APPLICABLE TO SOILS.



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| Aug. 2014 | Dec. 2015 | JUNE 2016 | NOV. 2016 | JUNE 2017 | Nov. 2013 |
| PUJ | PUJ | PUJ | PUJ | PUJ | PUJ |

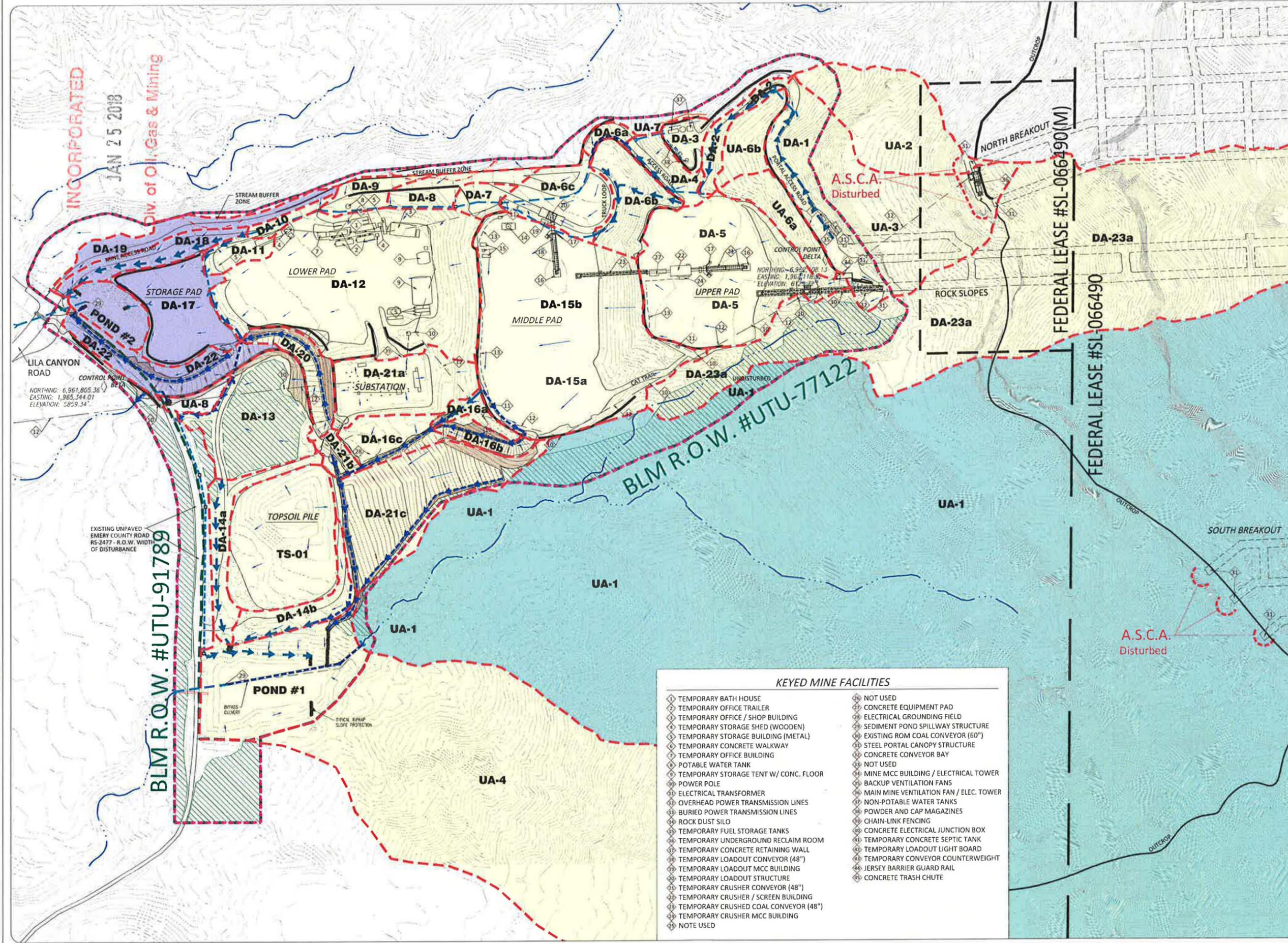


LEGEND:

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ANGIOCTAL ROCK DISTRIBUTION:

- Stream Buffer Zone
- MS Area Boundary
- Existing Ditch
- New Berried Culvert
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◇ TEMPORARY CRUSHED COAL CONVEYOR (48")	
◇ TEMPORARY CRUSHER MCC BUILDING	
◇ NOTE USED	

BLM R.O.W. #UTU-91789

BLM R.O.W. #UTU-77122

FEDERAL LEASE #SL-066490(M)

FEDERAL LEASE #SL-066490

NORTHING: 5,961,805.36
EASTING: 1,965,344.01
ELEVATION: 5859.34'

EXISTING UNPAVED EMERY COUNTY ROAD RS-2477 - R.O.W. WIDTH OF DISTURBANCE

A.S.C.A. Disturbed

A.S.C.A. Disturbed

INCORPORATED

JAN 25 2018

Div. of Oil, Gas & Mining

NOTE: "UNDISTURBED" DENOTES DRAINAGE AND IS NOT APPLICABLE TO SOILS.



| REVISION DATE: |
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| JAN 2008 | APR 2008 | JUL 2008 | JUN 2009 | JAN 2010 | Dec. 2013 |
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| PUJ | PUJ | PUJ | PUJ | PUJ | PUJ |

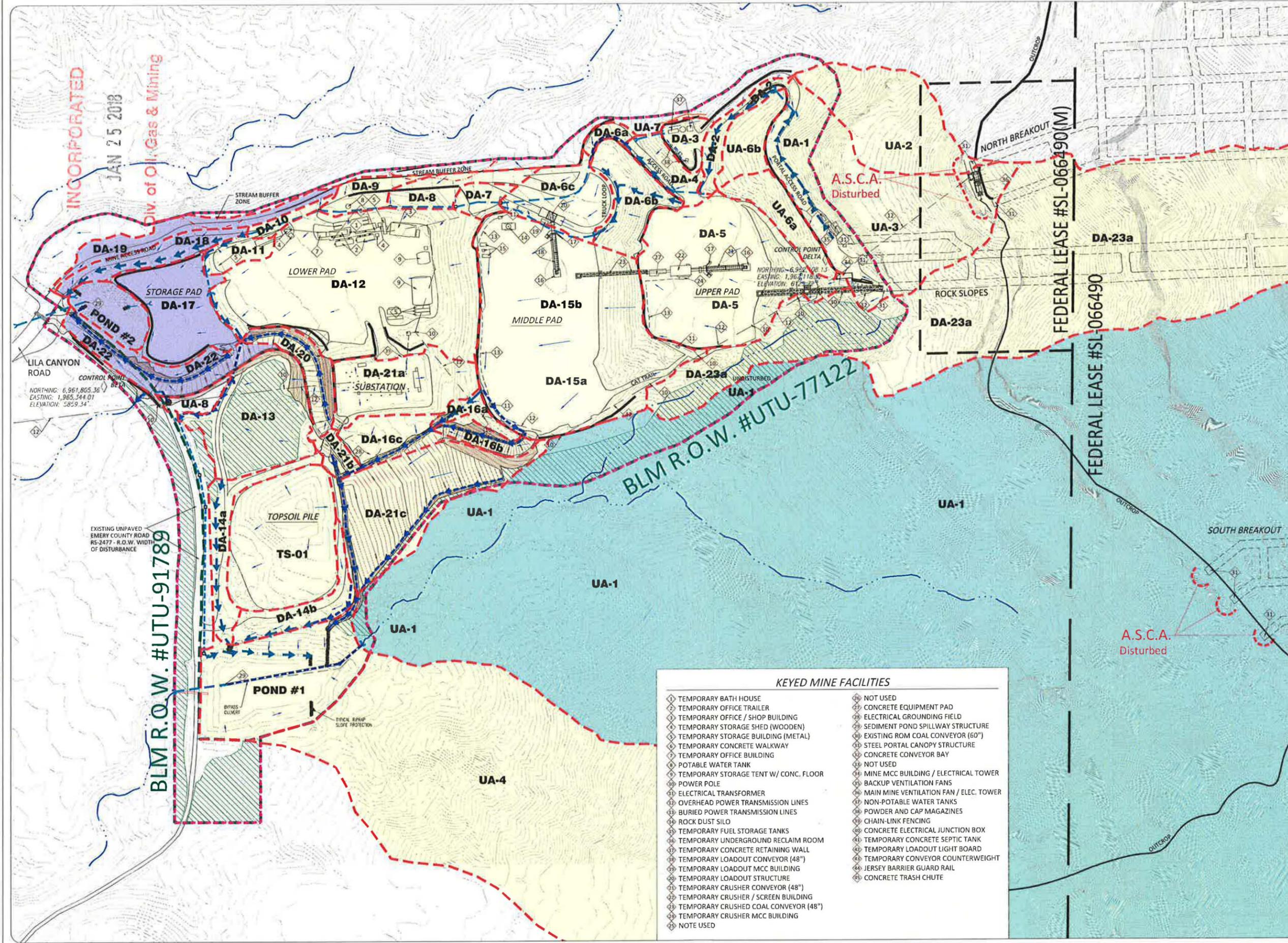


LEGEND:

- UNDISTURBED WITHIN THE DISTURBED AREA
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- TEMPORARY ROADWAYS
- BLM R.O.W. BOUNDARY LINES
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- DRAINAGE BYPASSING POND #1
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- UNSHADED

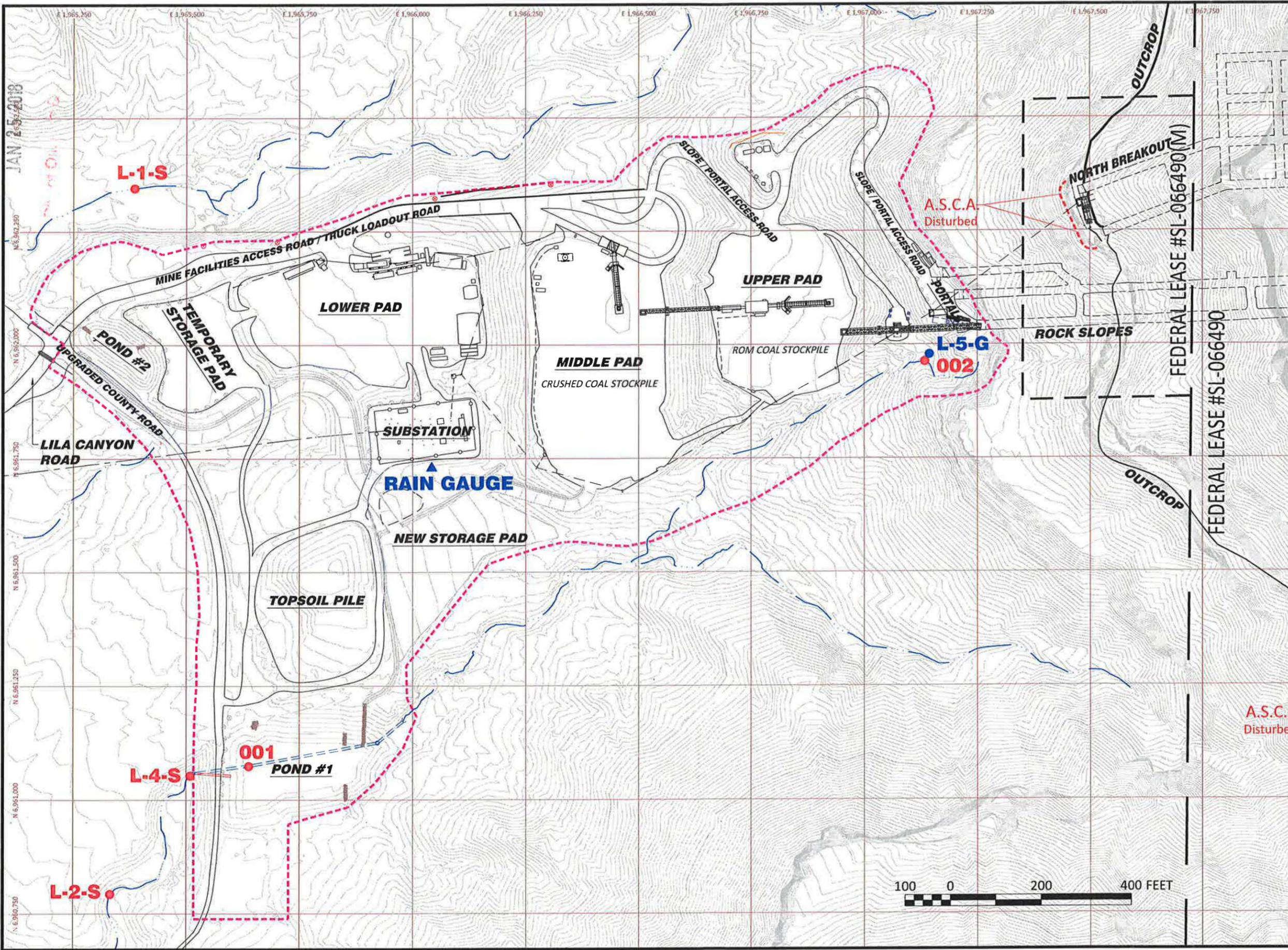
ANGIOCTAL ROCK DISTRIBUTION:

- Stream Buffer Zone
- MS Area Boundary
- Existing Ditch
- New Berried Culvert
- Existing Berried Culvert



INCORPORATED

G:\Current Drawings\MP Maps\Lila Canyon\New Storage Area\Working\Revisions - Task 5148\Plate 7-4a - Surface Facilities Water Monitoring.dwg, Surface Facilities Water Monitoring, 6/28/2017 10:19:36 AM, 1:1



WATER MONITORING SURFACE FACILITIES	
LILA CANYON MINE 23415 North Lila Canyon Road Green River, Utah 84525	
DOG M PERMIT #C007/013	SCALE 1" = 200'
DRAWN BY PJ	DATE 28 JUNE 2017
APPROVED BY DH	SHEET
PLATE 7-4a	



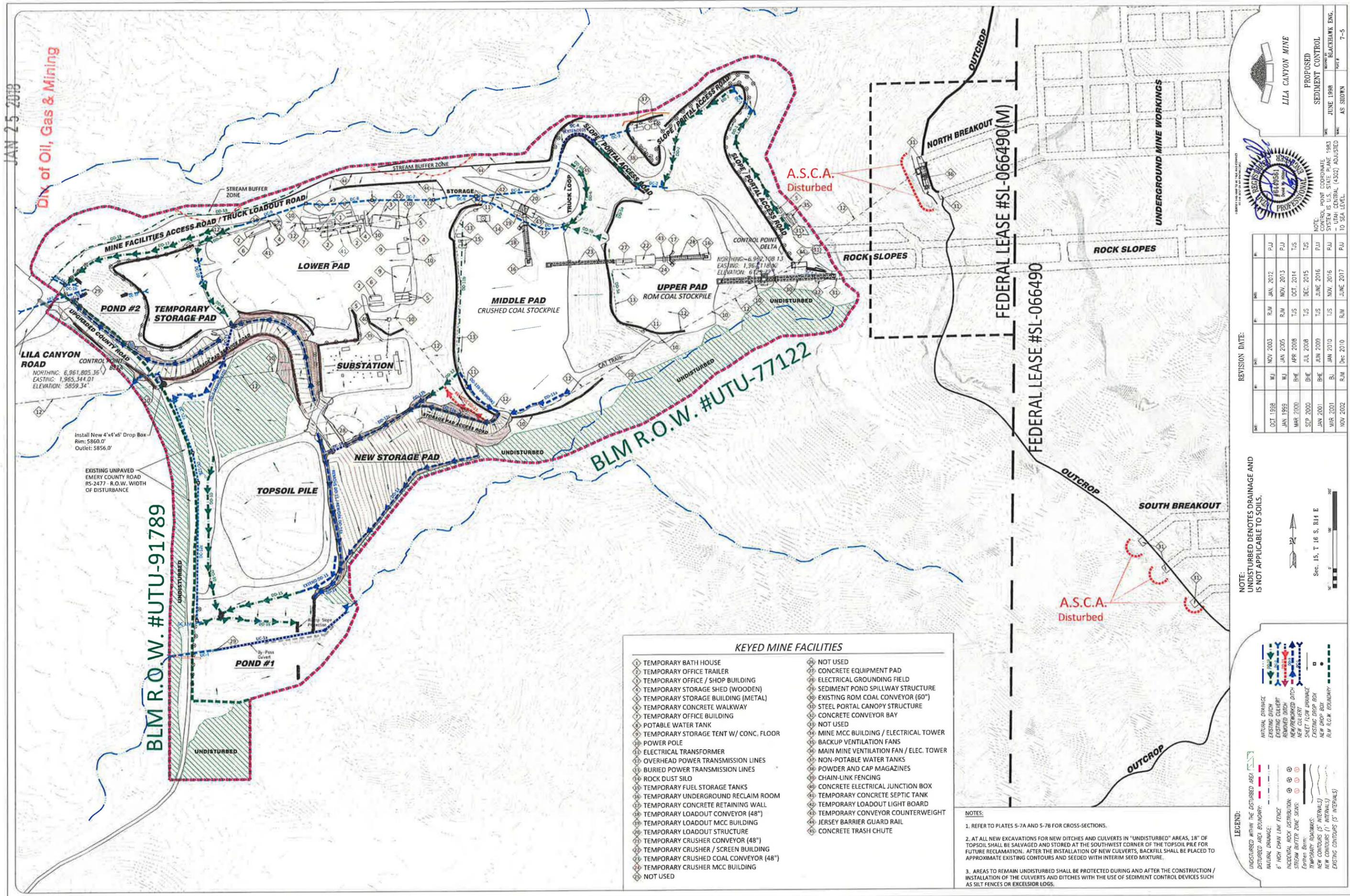
WATER MONITORING:	
HORSE CANYON MONITORING:	
LILA CANYON SURFACE MONITORING:	
LILA CANYON GROUNDWATER MONITORING:	
LILA CANYON CREST GAUGE MONITORING:	
LILA CANYON SEEP LOCATIONS:	
LILA CANYON RAIN GAUGE LOCATIONS:	
NOTE: WATER MONITORING LOCATIONS ARE APPROXIMATE.	

Active	★	○	●	■	▲
Suspended	○	○	○	○	○
A.S.C.A. Disturbed	★	○	○	○	○

INCORPORATED

JAN 25 2018

Div. of Oil, Gas & Mining



LILA CANYON ROAD
 CONTROL POINT
 NORTHING: 6,961,805.35
 EASTING: 1,965,344.01
 ELEVATION: 5859.34'

Install New 4'x4'x6' Drop Box
 Rim: 5860.0'
 Outlet: 5856.0'

EXISTING UNPAVED
 EMERY COUNTY ROAD
 RS-2477 - R.O.W. WIDTH
 OF DISTURBANCE

BLM R.O.W. #UTU-91789

BLM R.O.W. #UTU-77122

FEDERAL LEASE #SL-066490(M)

FEDERAL LEASE #SL-066490

KEYED MINE FACILITIES

- ◇ TEMPORARY BATH HOUSE
- ◇ TEMPORARY OFFICE TRAILER
- ◇ TEMPORARY OFFICE / SHOP BUILDING
- ◇ TEMPORARY STORAGE SHED (WOODEN)
- ◇ TEMPORARY STORAGE BUILDING (METAL)
- ◇ TEMPORARY CONCRETE WALKWAY
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- ◇ OVERHEAD POWER TRANSMISSION LINES
- ◇ BURIED POWER TRANSMISSION LINES
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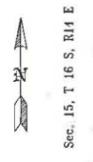
NOTES:

1. REFER TO PLATES 5-7A AND 5-7B FOR CROSS-SECTIONS.
2. AT ALL NEW EXCAVATIONS FOR NEW DITCHES AND CULVERTS IN "UNDISTURBED" AREAS, 18" OF TOPSOIL SHALL BE SALVAGED AND STORED AT THE SOUTHWEST CORNER OF THE TOPSOIL PILE FOR FUTURE RECLAMATION. AFTER THE INSTALLATION OF NEW CULVERTS, BACKFILL SHALL BE PLACED TO APPROXIMATE EXISTING CONTOURS AND SEEDED WITH INTERIM SEED MIXTURE.
3. AREAS TO REMAIN UNDISTURBED SHALL BE PROTECTED DURING AND AFTER THE CONSTRUCTION / INSTALLATION OF THE CULVERTS AND DITCHES WITH THE USE OF SEDIMENT CONTROL DEVICES SUCH AS SILT FENCES OR EXCLUSION LOGS.

REVISION DATE:

NO.	DATE	BY	DESCRIPTION	
1	NOV 2003	RJM	JAN 2012	PJJ
2	NOV 2005	RJM	NOV 2013	PJJ
3	APR 2008	BHE	TUS	TUS
4	JUL 2008	BHE	TUS	TUS
5	JUN 2009	BHE	JUN 2016	PJJ
6	JUN 2010	BHE	TUS	TUS
7	JUN 2011	BL	NOV 2016	PJJ
8	DEC 2010	RJM	JUN 2017	PJJ

NOTE:
 UNDISTURBED DENOTES DRAINAGE AND
 IS NOT APPLICABLE TO SOILS.



LEGEND:

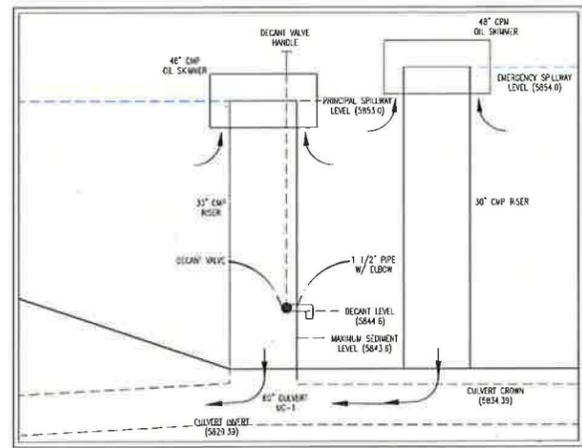
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- TEMPORARY ROADWAYS
- NEW CONTOURS (5' INTERVALS)
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- EXISTING CONTOURS (5' INTERVALS)
- NATURAL DRAINAGE
- EXISTING DITCH
- EXISTING CULVERT
- REMARKED DITCH
- NEW/REMARKED DITCH
- NEW CULVERT
- EXISTING FLOW DRAINAGE
- SHEET FLOW DRAINAGE
- EXISTING DROP BOX
- NEW DROP BOX
- BLM R.O.W. BOUNDARY
- RJM



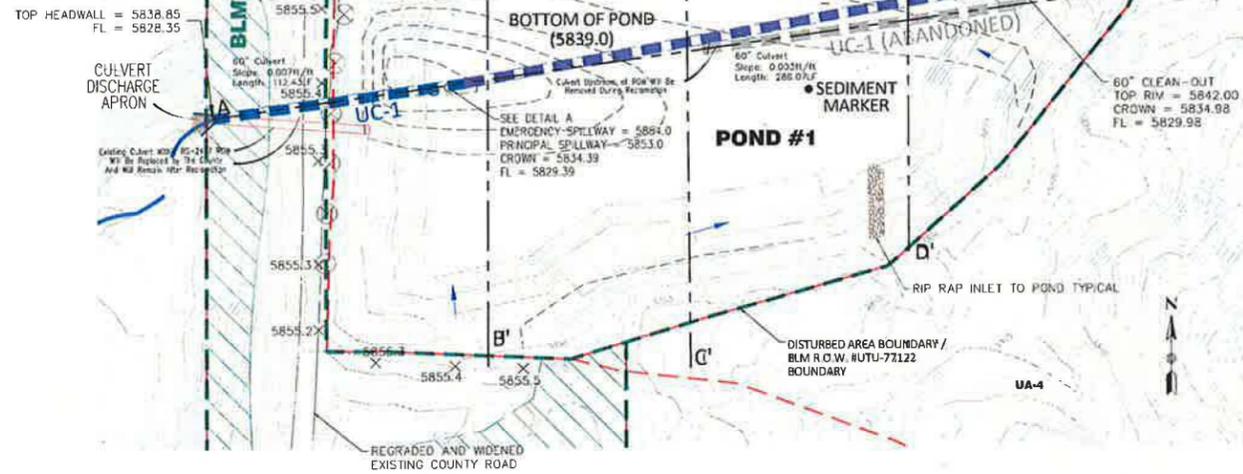
PROPOSED
 SEDIMENT CONTROL
 LILA CANYON MINE
 DATE: JUNE 1998
 AS SHOWN
 7-5



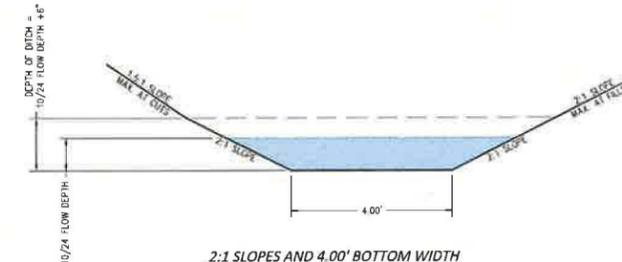
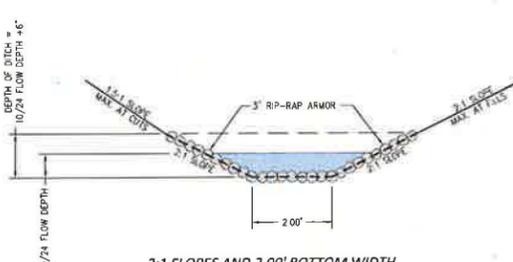
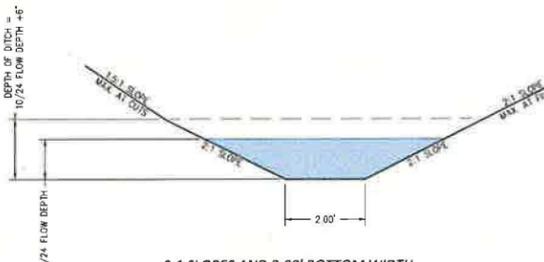
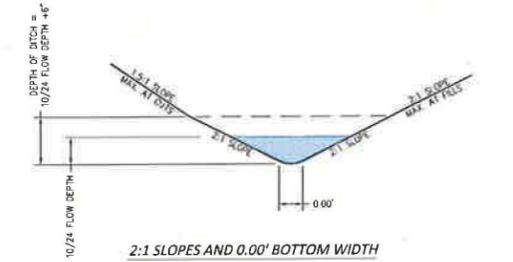
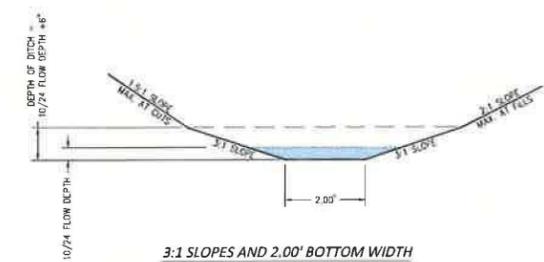
CULVERT UC-1 DETAIL



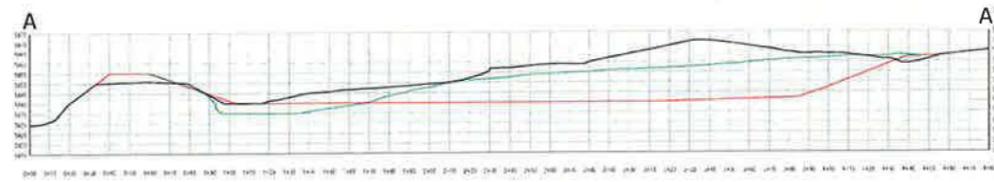
DETAIL "A"



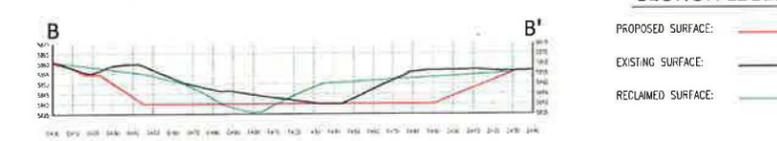
SEDIMENT POND #1 - PLAN VIEW



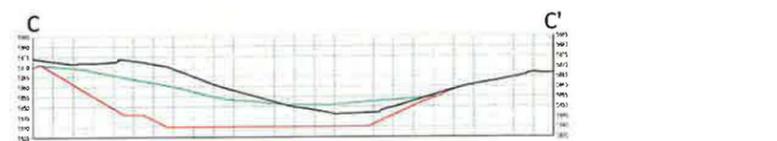
TYPICAL DIVERSION DITCH CROSS SECTIONS
NO SCALE
(COORDINATE WITH APPENDIX 7-4, TABLE 8)



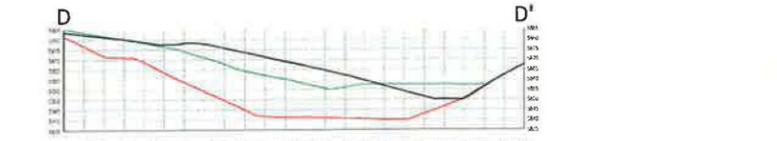
SEDIMENT POND #1 - SECTION A-A'



SEDIMENT POND #1 - SECTION B-B'



SEDIMENT POND #1 - SECTION C-C'



SEDIMENT POND #1 - SECTION D-D'

SECTION LEGEND

- PROPOSED SURFACE: (Red line)
- EXISTING SURFACE: (Black line)
- RECLAIMED SURFACE: (Green line)

- LEGEND:**
- PROPOSED CONTOURS: (Dashed line)
 - EXISTING CONTOURS: (Solid line)
 - RECLAIMED CONTOURS: (Dotted line)
 - DISTURBED AREA BOUNDARY: (Red dashed line)
 - BLM RIGHT-OF-WAY BOUNDARY: (Green dashed line)
 - NEW 4" MANHOLE: (Black circle)
 - EXISTING CULVERTS: (Blue dashed line)
 - NEW / RENOVATED DITCH: (Blue solid line)
 - EXISTING DITCH: (Blue dotted line)
 - FENCE LINE: (Black dashed line)
 - BEEM (BORING OPERATIONS): (Black dashed line)
 - UNDISTURBED DRAINAGE: (Black solid line)

REVISION DATE:

NO.	DATE	DESCRIPTION
1	APR 2006	TJS
2	APR 2009	TJS
3	JUL 2015	TJS
4	OCT 2015	TJS
5	JUNE 2016	PLJ
6	NOV 2016	PLJ
7	JUNE 2017	PLJ

LILLA CANYON MINE

PROPOSED SEDIMENT POND #1

HYDROLOGIC DESIGN

APRIL 2008

AS SHOWN

7-6a



NOTE: CONTROL POINT COORDINATE SYSTEM IS U.S. STATE PLANE 1983 UTM ZONE 12N, UTM CENTRAL (4302) - ADJUSTED TO SEA LEVEL.

