



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

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November 20, 2000

Melvin Coonrod, Resident Agent  
UtahAmerican Energy, Inc  
Environmental Industrial Service.  
31 North Main Street  
Helper, Utah 84501

Re: TA #4, Review of the Submittal Received September 25, 2000 for the Lila Canyon Significant Revision, UtahAmerican Energy, Inc., Horse Canyon Mine, C/007/013-SR98(1), Outgoing File

Dear Mr. Coonrod:

The Division has completed our review of your submittal received September 25, 2000 which was intended to address our June 29, 2000 deficiency letter. A fourth round TA (Technical Analysis) of your application is enclosed. You will note that there are still a number of deficiencies that remain unaddressed.

Please review the TA carefully to be certain that you understand the Divisions concerns. The deficiencies will need to be adequately addressed before your application can be approved. In responding, please use the redline, strike-out editing method to identify additions and deletions to the previous submittal.

In order for us to keep your application in active status, you should submit your response by January 22, 2001. Failure to do so may result in the Division returning your application. If you have any questions, or would like to set up a meeting to discuss the deficiencies, please feel free to call me, or Dave Darby at (801) 538-5341

Sincerely,

A handwritten signature in black ink that reads "Daron R. Haddock".

Daron R. Haddock  
Permit Supervisor

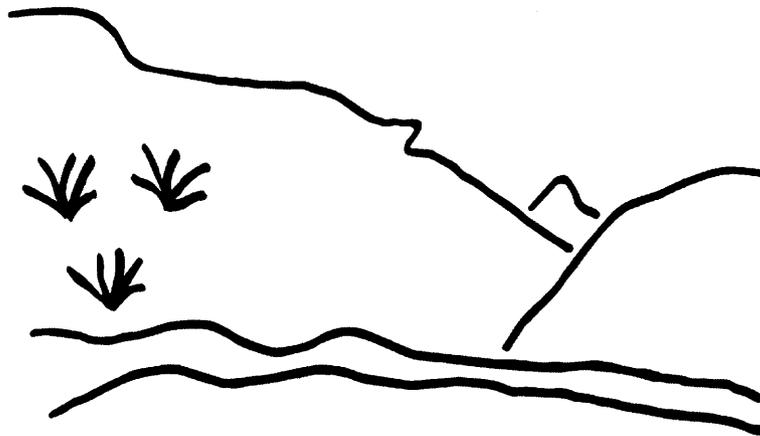
drh/sm

Enclosure:

cc: Clyde Borrell, VP, UtahAmerican Energy, Inc.  
Joe Wilcox, BLM  
Price Field Office

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# State of Utah



## Utah Oil Gas and Mining

### Coal Regulatory Program

Horse Canyon Mine  
Lila Canyon Tract  
C/007/013-SR98(1)-4  
November 20, 2000

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# TECHNICAL ANALYSIS

## INTRODUCTION

UtahAmerican (UtahAmerican Energy, Inc) has proposed to develop new mining facilities. This mine facility will be a significant revision (SR) to the Horse Canyon Mine. It lies within the northern half of the South Fork Lease which the BLM (Bureau of Land Management) established as the North Block LMU (Logical Mining Unit). The North Block LMU it was approved on January 1, 1994.

The SR for the Lila Canyon was received at the Utah Division of Oil, Gas and Mining on September 8, 1998. The Division conducted and completed a first and second completeness review by February 11, 1999. The SR was determined administratively complete on February 24, 1999. At the time it was known by the DOGM staff that some technical deficiencies existed which were evaluated and identified for this assessment.

Four technical analyses (TA) have been conducted on the SR. An initial TA was completed on May 26, 1999 and a second TA was completed October 19, 1999. UtahAmerican submitted their response to the second TA on December 10, 1999, and a redline/strikeout version of Chapters 1 thru 7 were received January 13, 2000. The second TA was found to contain some deficiencies and a third submittal was delivered to the office on March 10, 2000. The review was completed on June 23, 2000. The latest application was submitted on September 25, 2000.

The Division received a letter from a landowner, Josiah Eardley, on March 30, 1999 in response to the public notice published in the Sun Advocate. He pointed out his interest in surface waters he owns adjacent to the minesite. Although all local and adjacent hydrologic resources are evaluated for mining impacts in the normal review process, we wanted to acknowledge Mr. Eardley's interest for this assessment.

### COMPLETENESS

The Significant Revision application is not technically adequate. Several deficiencies exist which must be addressed and submitted to meet the minimum requirements of the State Program.



## SUMMARY OF OUTSTANDING DEFICIENCIES

- R645-300-141**, The permittee must revise Plate 5-5 and the mine plan so that all mining activities and planned subsidence occur inside the permit area. Plate 5-5 shows that mining and subsidence will occur outside the southern permit boundary area. . . . 56
- R645-300-141, R645-301-232.220**, The applicant needs to show methods of protecting soils in undisturbed areas adjacent to the coal mining and reclamation operations, especially the soils near the coal storage pile. The applicant should commit to checking these areas periodically to determine if there is any contamination and to cleaning up any fines that may accumulate. . . . 67
- R645-301-112.500**, According to an amendment application received by the Division September 25, 2000, the Intermountain Power Agency (IPA) no longer owns surface or mineral rights in or contiguous to the existing Horse Canyon permit area. The application needs to be updated to show this change in ownership. . . . 10
- R645-301-112.700**, The application needs to include the MSHA number for the refuse pile. . . . 10
- R645-301-114**, The applicant needs to update right of entry information. It appears the applicant no longer subleases the federal leases from IPA. . . . 11
- R645-301-114**, The application needs to include right of entry information for the portions of the proposed revised permit area in the E $\frac{1}{2}$  SE $\frac{1}{4}$  and SW $\frac{1}{4}$  of Section 15 of Township 16 South, Range 14 East, the proposed facilities area. . . . 11
- R645-301-115**, The application needs to contain approval from the public road authority authorizing mining and reclamation operations within 100 feet of a public road. While it appears Emery County may have given this approval, information in the application is contradictory. If the approval is to be in Appendix 4-2, the section of the application dealing with unsuitability claims should reference this appendix. . . . 13
- R645-301-121.100**, The permittee must modify the information in Section 553.120 to state the existence of highwalls on site correctly. In that section the permittee claims that no highwalls will be created. . . . 85
- R645-301-121.200**, The permittee must be clear, concise and consistent with the name used to refer to the disposal area for coal mine waste. The permittee refers to the area by several names such as the rock/coal waste storage areas, rock slope/coal waste storage areas, the pad and refuse pile. The permittee should avoid using terms to describe the coal mine waste that are not defined in the R645 rules. Those materials should be called coal mine waste, coal processing waste or underground development waste. . . . 72

**R645-301-121.200**, The permittee must be consistent when showing the areas labeled rock storage areas on all maps and plates. . . . . 72

**R645-301-121.200**, The permittee must identify the symbol for the chain link fence on Map 5-2. . . . . 53

**R645-301-121.200**, To the north of the slope, rock and refuse disposal area, Plates 5-2 and 7-5 show rock storage areas. The applicant needs to clarify what these areas are and show them on all appropriate maps. Depending on what these are, it might be necessary to provide more specific reclamation plans for these areas. . . . . 68

**R645-301-232.500**, The applicant needs to show how subsoils being stored as pad material will be protected from contaminants that would make them unusable. . . . . 67

**R645-301-232**, The applicant needs to clarify how jersey barriers would protect the topsoil between the rock slope portals and the coal stockpile. Facility construction itself would not be the only anticipated disturbance in this area; soils beneath the conveyor would probably be contaminated with coal fines and coal from spills. It appears “vents” may be a typographical error and that one or two “bents” will be erected in the area. . . . . 67

**R645-301-232**, The applicant needs to salvage soil from all areas that would be disturbed by coal mining and reclamation activities except the topsoil piles. According to various maps in the application, undisturbed and *in-situ* topsoil storage areas would have disturbance from drainage control structures, one of the rock slope portals, the run of mine conveyor, a refuse pile, and the coal storage pile. The topsoil salvage and storage plan needs to account for these disturbances. Also, the plan shows no access to the topsoil pile. The application needs to explain the difference between “*in-situ* topsoil storage” and “undisturbed” areas. . . . . 67

**R645-301-234.100, R645-301-521.160 and R645-301-521.165**, The applicant needs to show where soil from the fan site will be stored. If it is to be stored near the fan apart from the main storage area, the applicant needs to provide engineered drawings of the projected topsoil stockpile in the fan portal area, showing size, placement, and cross sections. Also, the calculations of the amount of soil in the main storage area would need to be modified. . . . . 68

**R645-301-234, R645-301-521.165**, The application needs to include enough detail of subsoil storage locations that it will be possible at the time of reclamation to know what cut and fill material will be replaced in which locations. . . . . 67

**R645-301-241 and R645-301-242**, The applicant needs to specify how deeply the area would be ripped. Also, the applicant needs to give more detail of the grading sequence with regard to subsoil and ripping. . . . . 88

**R645-301-321**, The applicant needs to supply vegetation cover information for the proposed disturbed pinyon/juniper community. . . . . 18

- R645-301-321**, The application includes three tables to be inserted in Appendix 3-2. These tables do not fit in the studies in this appendix. Two of the tables appear to contain woody plant density information, but they do not contain units and do not say exactly what the information is supposed to be. . . . . 18
- R645-301-322**, The raptor nest information on Plates 3-1 and 5-3 needs to correspond. . . . . 21
- R645-301-323**, The application says the revegetation reference area is shown on Plate 3-1, but this statement needs to be corrected or eliminated. The reference area is shown on Figure 1 of the report for the 1999 vegetation inventory. Also, the application has a statement that the reference area was chosen with the help of DOGM, and this is not correct. . . . . 95
- R645-301-333**, The applicant has committed to not subside escarpments that contain eagle nests, but it appears the area near one nest would be subsided. The applicant needs to contain a commitment that an alternate nest will be provided if this nest is lost through the effects of subsidence. If the nest is not lost, no additional mitigation would be needed. . . . . 56
- R645-301-341.220**, Section 341.220 says seed and fertilizer will be broadcast by hand or with a rotary seeder. A light cover of soil will be spread over broadcast seed. Although this section seems to indicate the entire area would be broadcast seeded, there is a paragraph discussing calibration of seed boxes indicating some areas would be drill seeded. Also, Appendix 5-8 says the reclaimed area will be hydroseeded. The applicant needs to clarify what seeding methods will be used. Since drill seeding is likely to decrease surface roughening, this method should not be used. . . . . 95
- R645-301-341.230**, The rates of tackifier application shown in Section 341.230 and Appendix 5-8 need to be consistent. . . . . 95
- R645-301-521.190** The permittee must give the Division copies of the aerial photographs that show the predisturbed area. If the Division were to reclaim the site, those photographs would be helpful in restoring the area. The permittee is responsible for giving the Division copies of all relevant data including aerial photography. . . . . 47
- R645-301-521.190**, The permittee must give the Division a copy of the letter from the State Engineer stating that the sediment pond design has been approved. . . . . 79
- R645-301-521**, The permittee must be consistent with showing the disturbed area boundaries. The permittee needs to explain what the green area on the permitting, operational and reclamation maps is. . . . . 81
- R645-301-521**, The permittee should show detailed plans showing how the Culvert UD-2 will be removed and a headwall installed to transmit flows under the roadbed. . . . . 90

- R645-301-525.440**, The Division finds the monitoring program inadequate because the survey time is too short. The Division usually requires the permittee to monitor 5 years after mining stops and subsidence stabilizes before allowing the permittee to stop subsidence monitoring. . . . . 56
- R645-301-525.440**, The permittee does not give details of the subsidence monitoring plan. The permittee needs to show the approximate location of the proposed monitoring points and commit to installing the monitoring points before mining begins. . . . . 56
- R645-301-525.440**, The subsidence monitoring program must include a ground survey. The ground survey is needed to find crack that could affect surface water. Note: the Division did require the permittee to remove a phrase from the amendment that involved a ground survey being needed to verify subsidence damage before mitigation could occur. The Division did not want the ground survey to be removed rather than mitigation would only occur after a ground survey was conducted. . . . . 56
- R645-301-525.490**, The permittee must show on Plate 5-5 or other similar maps those areas where subsidence control methods (first mining only) will be used to protect surface structures such as escarpments, seeps and springs and eagle nests. . . . . 81
- R645-301-526.116.1**, The permittee must show how the public will be protected from mining and reclamation activities constructed within 100 feet of the county road. Specifically the permittee must address how the public will be protected from the hazards associated with the sediment pond and other mine facilities. . . . . 53
- R645-301-526.116.1**, The permittee must modify the mine plan so that no mining activities occur within 100' of the county road. In the letter dated February 23, 1999 the Planning Commission required the permittee to place a 6' high chain link fence at a distance of 100' from the county road to protect the public. Map 5-2 shows that the chain link fence will be next to the road not 100' away from the road. . . . . 53
- R645-301-528.332**, The permittee needs to show the location of the on site concrete disposal areas and describe how the concrete will be placed and covered. If the permittee intends to dispose of noncoal mine waste in an area that is not a state approved facility then they must submit designs to show that no leachate will enter the groundwater or surface water. The general comment in Section 528.332 is inadequate to show that leachate will not degrade surface or underground water. **If the permittee intends to disposal of all noncoal waste except concrete at ECDC then they must modify the text.** . . . . . 72
- R645-301-533.300**, The permittee must show how the pond will be protected against sudden drawdown. Specifically The permittee must show that pore pressure in the embankments will not cause the pond to fail should a sudden drawdown occur.

## SUMMARY OF OUTSTANDING DEFICIENCIES

Revised : November 20, 2000

- An embankment may be stable under saturated and unsaturated condition but fail during a sudden draw down due to pour pressure. . . . . 79
- R645-301-536.100**, The designs for the refuse pile must include the detailed cross sections and maps. . . . . 72
- R645-301-536.110**, The designs for the refuse pile must include detailed slope stability analysis. The permittee must use a method that accounts for multiple soils with different physical properties. . . . . 72
- R645-301-536**, The cross sections in Figure 2, Appendix 5-7, need to be keyed to another map in the application. . . . . 68
- R645-301-542**, The permittee must give the Division detailed cross section of the reclaimed surfaces. The current cross section are at such a small scale that the Division cannot determine what reclamation activities will occur. . . . . 96
- R645-301-553.130**, In Section 553.130 the permittee states that all reclaimed slopes will have a static safety factor of at least 1.3. The permittee did not provide the slope stability analysis that supports the 1.3 safety factor claims for the reclaimed slopes. The Division did not receive that information. . . . . 85
- R645-301-553.250**, Figure 1, Appendix 5-7, shows a refuse area that would be in the *in-situ* topsoil storage area, but the application does not contain further details about this refuse area. If the applicant intends to construct a refuse pile in this area, it needs to provide for complete plans and topsoil salvage, storage, and reclamation of the pile. . . . . 68
- R645-301-553.300**, The permittee does not address how combustible material and acid and toxic forming materials will be handled, nor how the permittee will handle coal processing waste. . . . . 85
- R645-301-724**, water-levels in IPA-1, IPA-2, and IPA-3 were measured seasonally by IPA in 1994, 1995, and 1996 to provide baseline data (Appendix 7-1) for the South Lease. Surface-water quality and quantity was monitored at L-6-G, L-7-G, L-8-G, L-9-G, and L-10-G in 1993, 1994, and 1995. There are no baseline data, even no-flow reports, for L-1-S, L-2-S, and L-3-S in Lila Canyon, nor for surface water anywhere in the Lila Canyon drainage. A monitoring program was implemented in July 2000 (pages 7 and 30) to collect current baseline data that would be continuous with the operational data which are to follow: no data have been received by UDOGM for this recent monitoring, neither with the most recent version of the plan revision nor with the quarterly reports. . . . . 43
- R645-301-742**, The permittee needs to address the sizing calculations for culvert UC-1, it is sized for a 30 inch diameter culvert whereas, culvert UC-2 just down stream is sized for a 60 inch culvert. It is highly recommended the undisturbed culvert UC-1 be sized in concert with UC-2, required by the Division of Water Rights. . . . . 79



# GENERAL CONTENTS

## IDENTIFICATION OF INTERESTS

Regulatory Reference: 30 CFR 773.22; 30 CFR 778.13; R645-301-112

### Analysis:

The applicant is UtahAmerican Energy, Inc., a Utah corporation. The application gives the name, address and telephone number of the applicant and its resident agent and includes the employer identification number for the applicant. UtahAmerican will pay the abandoned mine reclamation fee.

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

Most of this ownership and control information has been previously approved as part of the Horse Canyon mining and reclamation plan. Some of it is hard to follow, but it is possible to determine the corporate structure.

The application is required to include the names, addresses, permit numbers, regulatory authorities, employer identification numbers, and MSHA numbers together with dates of issuance for coal mining and reclamation operations owned or controlled by the applicant or by any person that owns or controls the applicant, and this information is in Appendix 1-9 of the Horse Canyon plan and Section 112.340 of the current application. No permitted operations are shown for Coal Resources, Inc.; PennAmerican Coal, Inc.; AmCoal Holdings, Inc.; Mill Creek Mining Company; Pinski Corporation; American Coal Sales Company; West Virginia Resources, Inc.; Pennsylvania Transloading, Inc.; Sunburst Resources, Inc.; Ohio Valley Resources, Inc.; and Spring Church Coal Company. It is assumed these companies do not have associated coal mining and reclamation operations.

Section 112.500 of the text and Plates 4-1 and 5-4 show surface and coal ownership in and contiguous to both the existing permit area and the proposed addition. According to an amendment application received by the Division September 25, 2000, the Intermountain Power Agency (IPA) no longer owns surface or mineral rights in or contiguous to the existing Horse Canyon permit area. The application needs to be updated to reflect this change in ownership.

The application shows MSHA identification numbers for both the Horse Canyon and Lila Canyon Mines, but it says the refuse pile identification number has yet to be issued. The applicant will need to obtain an MSHA identification number for the refuse pile.

According to this section of the application, there are no lands, interests in lands, options, or pending bids on interests held or made by the applicant for lands contiguous to the proposed addition to the permit area. Plates 4-1 and 5-3 shows federal leases to the south of the proposed addition to the permit area that are labeled "area of future mining."

### **Findings:**

Information in the application is not adequate to meet the requirements of this section of the regulations. Prior to final approval, the applicant must supply the following in accordance with:

**R645-301-112.500**, According to an amendment application received by the Division September 25, 2000, the Intermountain Power Agency (IPA) no longer owns surface or mineral rights in or contiguous to the existing Horse Canyon permit area. The application needs to be updated to show this change in ownership.

**R645-301-112.700**, The application needs to include the MSHA number for the refuse pile.

### **VIOLATION INFORMATION**

Regulatory Reference: 30 CFR 773.15(b); 30 CFR 773.23; 30 CFR 778.14; R645-300-132; R645-301-113

#### **Analysis:**

According to the application, neither UtahAmerican Energy nor any subsidiary, affiliate, or persons controlled by or under common control with them has had a federal or state permit suspended or revoked in the past five years, and these same entities have not forfeited a performance bond or similar security. The application says Appendix 1-3 contains a list of violations received by affiliated companies for the past three years, but Appendix 1-3 says these violations are listed in Appendix 1-8 of the Horse Canyon mining and reclamation plan. It appears from this information there is one violation that has yet to be terminated and that administrative proceedings are ongoing.

Information in this and the ownership and control section will need to be checked in the applicant violator system, but it appears the application contains the required information to comply with R645-301-113.

#### **Findings:**

Information provided in the application is considered adequate to satisfy the requirements of this section of the regulations.

### **RIGHT OF ENTRY**

Regulatory Reference: 30 CFR 778.15; R645-301-114

#### **Analysis:**

According to the application, UtahAmerican Energy has subleased 5544.01 acres of federal coal from IPA. This was executed on August 24, 1998, and UtahAmerican Energy bases its right to enter on language contained in the leases and quoted in the application. The Bureau of Land Management

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**GENERAL CONTENTS**

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approved the subleases on February 16, 1999. Table 1-1 shows the legal descriptions and acreages for the federal leases. The total permit area, including both permit area "A," the existing permit area, and permit area "B," the proposed addition, would be 6461.79 acres.

According to a separate amendment application for the Horse Canyon mining and reclamation plan, UtahAmerican no longer subleases federal lease SL-066145 from IPA, and a Bureau of Land Management representative said in a telephone conversation that UtahAmerican no longer subleases the other leases in the Lila Canyon area. The applicant needs to update the right of entry information.

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

According to Plate 5-4 and other plates, the surface facilities would be built in Section 15 of Township 16 South, Range 14 East. The land is managed by the Bureau of Land Management, but it is not in the federal coal leases. The application includes a letter from the Bureau of Land Management indicating applications for rights of way for certain facilities have been received, but the application does not include required right of entry information for these areas.

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

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

**Findings:**

Information provided in the application is not considered adequate to meet the requirements of this section of the regulations. Prior to final approval, the applicant must provide the following in accordance with:

**R645-301-114**, The applicant needs to update right of entry information. It appears the applicant no longer subleases the federal leases from IPA.

**R645-301-114**, The application needs to include right of entry information for the portions of the proposed revised permit area in the E $\frac{1}{2}$  SE $\frac{1}{4}$  and SW $\frac{1}{4}$  of Section 15 of Township 16 South, Range 14 East, the proposed facilities area.

**LEGAL DESCRIPTION AND STATUS OF UNSUITABILITY CLAIMS**

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

**Analysis:**

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

The application says UtahAmerican Energy has received permission from Emery County to construct mining facilities and conduct mining operations within 100 feet of the road and refers to an agreement letter in Appendix 1-4. The agreement in this appendix is for construction of the road and requires UtahAmerican to acquire an encroachment permit from the county. The agreement acknowledges the mine would be built within 100 feet of the Emery County road. It also gives certain conditions with which UtahAmerican will need to comply when they receive the encroachment permit, but since the applicant has not yet received the encroachment permit, the agreement does not constitute approval.

Appendix 4-2 contains portions of the minutes of an Emery County Commission meeting where the commission approved the Large Scale Industrial Site Plan for the Lila Canyon Mine. The applicant's representative contends this approval constitutes approval to mine within 100 feet of the Emery County road. The applicant has not supplied the Division a copy of the portion of the site plan dealing with the road, so the Division does not know exactly what the county approved and whether this approval meets the requirements of the regulation. However, the application also includes a copy of a letter from Rex Funk, Road Supervisor for Emery County. Mr. Funk's letter says Emery County understands mining and reclamation activities would occur within 100 feet of the county road and that this issue was specifically discussed during the Planning and Zoning Commission phases of the County Permit. The letter goes on to say, "We have no problem with this issue provided that a 6' chain link fence is installed around UEI's activities at a distance of 100' from the public road as protection from any normal hazards generally associated with your industry."

The information in the letter from Mr. Funk is contradictory. He indicates mining and reclamation operations would be allowed within 100 feet of the road but then says these activities would need to be kept within a chain link fence at least 100 feet from the road. Therefore, the Division is still unsure whether mining and reclamation operations would be allowed within 100 feet of the Emery County road.

If approval, or a portion of the approval, for having the mine within 100 feet of the road is to be in Appendix 4-2, the section of the application dealing with unsuitability claims should refer to this appendix.

The applicant has not changed this portion of the application since the previous technical analysis and has not discussed the issues with the Division. Therefore, the deficiency with this portion of the application remains the same.

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**Findings:**

Information provided in the application is not considered adequate to meet the requirements of this section of the regulations. Prior to final approval, the applicant must provide the following in accordance with:

**R645-301-115**, The application needs to contain approval from the public road authority authorizing mining and reclamation operations within 100 feet of a public road. While it appears Emery County may have given this approval, information in the application is contradictory. If the approval is to be in Appendix 4-2, the section of the application dealing with unsuitability claims should reference this appendix.

**PERMIT TERM**

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

**Analysis:**

The permit term for which the applicant is applying is five years. The beginning of construction is planned for 2001 with mining operations ending in 2025. This assumes adjacent federal leases can be acquired.

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

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

**Findings:**

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

**PUBLIC NOTICE AND COMMENT**

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

**Analysis:**

Appendix 1-5 contains copies of the newspaper advertisement and proof of publication.

**Findings:**

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

## **FILING FEE**

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

### **Analysis:**

Because this is an application for a significant revision and not for a new permit, the filing fee is not required.

### **Findings:**

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

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## ENVIRONMENTAL RESOURCE INFORMATION

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

### GENERAL

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

#### Analysis:

The permittee gave the Division information in Section 521 of the PAP that describes the lands subject to coal mining and reclamation over the estimated life of mine. The general requirements of R645-301-521 have been met with respect to environmental resource information. The specific requirement of R645-301-521 will be addressed in the sections that follow.

#### Findings:

The permittee has met the minimum requirements of this section.

### PERMIT AREA

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

#### Analysis:

Plate 1-1, Permit Area Map, shows the permit boundaries for the Horse Canyon Mine. The permit boundaries are divided into Permit Area A, which is the Horse Canyon project that is now being reclaimed and Permit Area B, which is the proposed Lila Canyon project.

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

#### Findings:

The permittee met the minimum requirements of this section.

### HISTORIC AND ARCHAEOLOGICAL RESOURCE INFORMATION

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

#### Analysis:

Appendix 4-1 of the application contains information from three cultural resource surveys, including one done specifically for the proposed facilities area. There are several cultural resource sites

in the vicinity, but only an isolated artifact was found in the proposed disturbed area. One site is listed on the National Register of Historic Places. It is a tree in Horse Canyon inscribed by Sam Gilson, a prominent rancher and promoter of the uses of gilsonite.

The information in the application is considered adequate. Maps and reports on archaeological resources have been marked confidential..

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

**Findings:**

Information provided in the application is considered adequate to meet the requirements of this section of the regulations. The Division must keep confidential any information that would enable a person to locate any of the cultural resource sites.

**CLIMATOLOGICAL RESOURCE INFORMATION**

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

**Analysis:**

The proposed mine site is in an area with an annual precipitation of approximately 12 inches, as described by Lines and others (1984). The permittee indicates an average annual precipitation as high as 13.69 inches, the information was downloaded from the Western Regional Climate Center as shown in Table 7-1A.

The permittee has provided mean annual temperatures and average seasonal temperatures in Table 7-1A, Chapter 7,

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

**Findings:**

The permittee has submitted sufficient information to address this section.

**VEGETATION RESOURCE INFORMATION**

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

**Analysis:**

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

The 1999 vegetation inventory was site-specific to the proposed disturbed area and nearby proposed reference area, and the following discussion concerns this report. The 1999 study includes a map showing the vegetation communities in relation to the proposed disturbance, but it does not show sample locations.

The vegetation inventory done in 1999 is for the grass/shrub community and a corresponding reference area to the west of the proposed disturbed area. Predominant species in both areas were cheatgrass, Salina wild rye, snakeweed, blue grama, needle and thread grass, Indian ricegrass, galleta, and purple three awn. Total vegetative cover in the proposed disturbed area was 39.7%, and it was 44.8% in the reference area.

The application previously contained a copy of a report for a 1998 vegetation study. According to information in this study, vegetative cover in the proposed disturbed pinyon/juniper area was 19.7% (excluding lichens). Dominant species were Salina wild rye, Utah juniper, two-needle pinyon, and green rabbitbrush. The plants identified as green rabbitbrush were probably, instead, snakeweed. No green rabbitbrush was identified in the area in the 1999 survey, and a Division representative did not find green rabbitbrush in the area.

While the applicant is not proposing to use a pinyon/juniper community as a success standard, the application still needs to contain basic information about all communities that would be disturbed. The application includes productivity and woody plant density information for the pinyon/juniper community, but it does not include vegetative cover information for this area. Since, as discussed below, it is not necessary to do a statistical comparison between the proposed disturbed pinyon/juniper area and the revegetation reference area, the information from the 1998 report that was included in previous submittals, if revised to show correct species identifications, would fulfill this requirement. Any discussion in this report about statistical analyses should be deleted.

Although the Division would normally compare vegetation cover in the reference area statistically with cover in the proposed disturbed area, this is impossible with the data the Division anticipates is available for the pinyon/juniper area. Nevertheless, since the applicant proposes using a reference area from a different community as a success standard for the entire site, and since vegetative cover in the proposed disturbed pinyon/juniper community was so much lower than in the grass/shrub reference area, the cover data from the pinyon/juniper area, if included in the application, should be adequate.

A table in the 1999 study shows woody plant densities in the proposed disturbed grass/shrub and pinyon/juniper communities and in the reference area. Densities were 6260, 1560, and 7200 stems per

acre for these three communities, respectively. In the grass/shrub areas, 88% of the woody plants were snakeweed, a poisonous plant.

The application submitted in September 2000 contains three tables for Appendix 3-2. These tables do not fit into the vegetation surveys in the application. It is possible the applicant intends them to be included as part of the 1998 vegetation survey, but this study was previously removed from the application. Table 1 is a list of botanical and common names, Table 7 is titled "Pinyon/Juniper Disturbed Area Compared with Reference Area," and Table 8 is titled "Total Disturbed Area Compared with Total Reference Area." Neither Table 7 nor 8 gives units for the numbers although it appears they may be woody plant density numbers. The previous application included this information, and it conflicts with the new numbers. The applicant needs to give further information about the numbers in Tables 7 and 8.

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

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

### **Findings:**

Information provided in the application is not considered adequate to meet the requirements of this section of the regulations. Prior to final approval, the applicant must provide the following in accordance with:

**R645-301-321**, The applicant needs to supply vegetation cover information for the proposed disturbed pinyon/juniper community.

**R645-301-321**, The application includes three tables to be inserted in Appendix 3-2. These tables do not fit in the studies in this appendix. Two of the tables appear to contain woody plant density information, but they do not contain units and do not say exactly what the information is supposed to be.

## **FISH AND WILDLIFE RESOURCE INFORMATION**

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

**Analysis:****Wildlife Information**

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

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

Plate 5-3 shows raptor nests and also includes subsidence limits. According to Plate 5-3, one golden eagle nest would be in the subsidence area. The nest locations shown on Plate 5-3 are not the same as those shown on Plate 3-1, and the Division is not certain which map is accurate. The discrepancy is important for the applicant because the nest shown on Plate 5-3 as being in the subsidence area is not shown on Plate 3-1.

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

The application indicates the applicant has consulted with the Fish and Wildlife Service, the Division of Wildlife Resources, and the Bureau of Land Management concerning raptor nests in the vicinity of the mine. They determined there is a high probability golden eagle nests near the surface facilities would be abandoned.

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

**Threatened and Endangered Species**

Table 3-1 lists seven threatened or endangered species the application says may occur in Emery county or that could be affected by the mine. Appendix 3-3 contains a letter from the Fish and Wildlife Service listing threatened and endangered species that occur in Emery county.

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

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

The application documents that the proposed addition to the permit area does not contain habitat for southwestern willow flycatchers. There are no perennial water sources or riparian areas in either the current permit area or the proposed addition, and according to verbal information from the applicant'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.

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

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

Black-footed ferrets have historically been found in eastern Utah, but, with the exception of the population recently reintroduced to the Uintah Basin, there have been no confirmed sightings in recent years. If any were in the area, it is most likely they would be affected by road construction.

(Information in the following discussion on the distribution of plants is from *A Utah Flora* or is verbal information from Bob Thompson, a botanist with the Forest Service.)

Barneby reed-mustard (*Schoenrambe barnebyi*) grows at elevations of about 5600 to 5700 feet on the Chinle formation. The proposed disturbed area is at a higher elevation, and it does not contain the Chinle formation. Therefore, the area is not considered habitat for this species.

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

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

The Maguire daisy (*Erigeron maguirei*) has only been found in a few places in the San Rafael Swell and in Capitol Reef National Park in canyon bottoms in the Wingate and Navajo Sandstone

formations. There is essentially no possibility this species could occur in the proposed addition to the permit area.

Three cactus species are included on the Fish and Wildlife Service list. The San Rafael cactus or Despain footcactus (*Pediocactus despainii*) is very difficult to find and grows in open pinyon/juniper communities in and on the edges of the San Rafael Swell. This is the type of habitat in the proposed disturbed area, and, according to Bob Thompson of the Forest Service, there is potential this species could occur in the area. However, the application indicates the applicant's consultant searched for this plant and did not find it.

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

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

The Division received comments from the Fish and Wildlife Service dated April 14, 1999, and further comments dated October 14, 1999. They felt the Division had adequately responded to their concerns and did not disagree with the Division's findings concerning threatened or endangered species.

### **Findings:**

Information in the proposal is not adequate to meet the requirements of this section of the regulations. Prior to final approval, the applicant must supply the following information in accordance with:

**R645-301-322**, The raptor nest information on Plates 3-1 and 5-3 needs to correspond.

## **SOILS RESOURCE INFORMATION**

Regulatory Reference: 30 CFR 783.21; 30 CFR 817.22; 30 CFR 817.200(c); 30 CFR 823; R645-301-220; R645-301-411.

### **Analysis:**

Chapter 2, Soils, Sections 210 through 224, discusses the soil resources within the proposed Lila Canyon Mine. Relevant soils information includes prime farmland investigation, current and published soil surveys, soil characterizations, and substitute topsoil identification. The Analysis section discusses resource information as follows:

- Prime Farmland Investigation
- Soil Survey Information
- Soil Characterization
- Substitute Topsoil

## Prime Farmland Investigation

A Prime Farmland site investigation was performed by the Natural Resources Conservation Service (NRCS). A determination was made that no Prime Farmland or farmland of statewide importance were found within the proposed Lila Canyon coal lease area and support facilities area because there is no developed irrigation system on arid soils. The determination letter from the NRCS dated June 8, 1998, was sent to Environmental Industrial Services and is included in Appendix 2-1.

## Soil Survey Information

The soil survey information contains both general and site specific surveys as follows:

### *(1) General, Third Order Soil Survey*

Appendix 2-2 and Soils Map 2-1 make up the general Order 3 soil survey. The unpublished Order 3 soil survey for Emery County is currently in progress by the U. S. Department of Agriculture, Natural Resource Conservation Service (NRCS). Portions of the Order 3 soil survey relevant to the Lila Canyon Mine project has been provided by the NRCS. The soil map (Plate 2-1) is scaled at 1:24,000 and includes map unit descriptions.

The Order 3 soil survey information provided by the NRCS identifies four soil mapping units located within the mine surface facilities area as:

- BNE2 Strych very bouldery, fine sandy loam, 3 to 20 % slopes
- BMD Strych very stony fine sandy loam, 3 to 30 % slopes
- NGG2 Gerst-Strych-Badland complex, 30 to 70 % slopes
- RZH Rock Outcrop-Atchee-Rubbleland Complex

In addition, the Order 3 soil survey (Appendix 2-2) and soil map (Plate 2-1) provide identities and information on the following soil mapping units as located within Permit Area "B" for Lila Canyon boundary as follows:

- DHG2 Comodore-Datino Complex
- DSG 2 (HUG) Midfork-Tingey-Comodore Complex
- GNA Neto fine sandy loam
- KXH Podo-Rock outcrop Complex
- MHE (MSC) Podo sandy loam, 1 to 8 percent slopes
- MRG Vassilla-Rock outcrop-Gerst Association
- MTH Cabba-Guben-Rock outcrop Complex
- MUE Cabba-Podo-Doney Complex
- NGG2 Gerst-Strych-Badland Complex
- NVF2 Gerst-Rubbleland-Badland
- NXC Lazear-Rock outcrop Complex, high rainfall
- RR Rock outcrop
- RWG Rock outcrop-Rubbleland-Vassilla Complex
- RZH Rock outcrop-Atchee-Rubbleland Complex
- UMF2 Guben-Pathead-Rabbitex Association

- VOH Guben-Rock outcrop Complex

Appendix 2-2 also provides typical soil pedon and soil descriptions for the following Soil Series: Atchee, Cabba, Comodore, Datino, Doney, Gerst, Guben, Lazear, Midfork, Neto, Pathead, Pinon, Podo, Rabbitex, Strych, Tingey, and Travessilla.

*(2) Site specific, First Order Soil Surveys*

In August 1998, a site specific Order 1 soil survey for the surface facilities area was performed by Mr. Daniel Larsen, Soil Scientist, Environmental Industrial Services, and his report is located in Appendix 2-3. The survey contains soil descriptions, soil pedon descriptions, soil salvage suitability analysis, laboratory soil testing data, field soil profile descriptions, soil and landscape photographs, a soils map, and a salvageable soils map. The detailed soil survey of the surface facilities site identifies six soil map units as follows:

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

All mapping and soil survey work were performed according to the standards of the National Cooperative Soil Survey. Based on the site-specific soil descriptions, and laboratory data, each soil was classified according to current, unpublished NRCS soil taxonomy, and correlated to a specific soil series. The RBT soil unit references the Travessilla family complex; however, the Travessilla family has been revised by NRCS to the Atchee series which is a more appropriate for Map Unit RBT.

Soil productivity of existing soils was determined by Mr. George Cook from the Natural Resources Conservation Services, and results are shown in Appendix 3-7.

An addendum has been attached to Appendix 2-3 to include the Lila Canyon Mine, proposed portal fan site soil evaluation. Two soil descriptions were taken at the site and include pits LC11 and LC12. Rating of soil suitability criteria shows good ratings, except for water holding capacity with a poor rating. Average soil depth is about 15 inches, with a range of about three feet to zero. The deeper soils are at the upper edge of the bench which grade to bedrock sandstone at the lower edge. Soils are derived primarily from colluvial materials.

### **Soil Characterization**

Soil pedons were characterized by the soil horizons at each sampling location. All profile descriptions were recorded on standard NRCS forms and are provided in Appendix D within Appendix 2-3. The soil horizons at each sampling location were sampled and characterized according to the State

of Utah Division of Oil, Gas and Mining (DOGM) guidelines for topsoil and overburden<sup>1</sup>. Sampled parameters included: soil texture; pH; organic matter percent; saturation percent; electrical conductivity; CaCO<sub>3</sub>; soluble potassium, magnesium, calcium and sodium; sodium absorption ratio, and extractable selenium and boron. Available water capacity, alkalinity, total nitrogen and available phosphorus were not analyzed at this time; these parameters can be tested at reclamation time. Organic matter percent was substituted for organic carbon. Soil texture by hand-texture method, rock fragment content (% by volume), and Munsell color were determined in the field by Mr Larsen. Generalized soil properties, including percent surface stones and boulders, are summarized as follows for each soil type:

**Table 1.** Selected soil physical characteristics.

Map Unit	%Surface Stones & boulders	Soil Depth	% Slope	Permeability	Water Erosion Potential
SBG	3-8	Very Deep >60"	5-15	Moderate to Moderately rapid	Moderate low
VBJ	8-20	Very Deep >60"	5-15	Moderately rapid	Moderate low
XBS	20-40	Very Deep >60"	10-45	Moderately rapid	Low to moderate
DSH	<2	Very Deep >60"	3-8	Moderately rapid	Moderate
RBL	>50	Shallow to Deep	20-70	Slow to moderately rapid	Severe on shale, Low on rock
RBT	>50	Shallow	30-100	Slow to moderately rapid	Severe to Low

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

- **pH** was high (rated poor) in only one sample - LC3, 24-48" with pH 8.6. Sample LC4, 40-58" had a pH of 8.2, which is rated fair to good. All other samples tested from pH 7.1 to 8.0 for a good rating.
- **Electrical Conductivity** and **SAR** were high in samples LC3 48-55" and LC5 40-58". For sample LC3 48-55", the SAR was 18 with an EC of 2.48. Since the SAR is greater than 15, soil materials below 48 inches are considered unacceptable. For sample LC5 40-58", the SAR measured 15 with an EC value of 8.89 mmhos/cm. The SAR is rated unacceptable for coarse textured soils and the

<sup>1</sup>Leatherwood, J., and Duce, D., 1988. Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining. State of Utah Department of Natural Resources, Division of Oil, Gas and Mining.

EC is rated poor; therefore, soil materials below 40 inches are considered marginal at best.

Sample LC10 0-4" had an EC of 2.58 mmhos/cm which has a rating of fair. All other samples had EC values ranging from 0.29 to 4.0 mmhos/cm, which is rated as good.

- **Soil textures** were classified as sandy loam, except for samples LC1 3-10" and LC10 0-4" which were sandy clay loam and silt loam respectively. Based on soil texture, all soils tested are rated as good for reclamation material.
- **Available water holding capacity** values ranged from good to poor. The majority of samples were rated as fair; with LC1 0-3" rated poor; and LC1 10-23", LC5 29-40", LC5 40-58", and LC6 5-18" rated good.
- **Soluble boron** tested at less than 5.0 mg/kg on all samples, resulting in a good rating.
- **Extractable selenium** content tested at 0.02 mg/kg or less, which is considered good since all readings are less than 0.10 mg/kg.
- **Organic matter** content is relatively low in these soils. Generally, the surface soils ranged between 1.0 to 1.5 percent organic matter and the subsoils were about 0.5 percent.
- A **calcic horizon** was verified in soil pedons LC1, LC5 and LC6 with  $\text{CaCO}_3$  ranging between 20 to 21 percent. Pedons LC3 and LC4 have some  $\text{CaCO}_3$  accumulation in the subsoil but is less than the 15 percent needed to be classified as a calcic horizon.
- **Soluble magnesium** exceeded soluble calcium below depths of 30 inches. In general for these samples, the soluble calcium decreases and magnesium increases with depth.

Normally, higher ratios of calcium to magnesium exist in soil solutions. Calcium is retained much more readily than magnesium on soil colloid exchange sites, resulting in the total amount of calcium in soils exceeding that of magnesium. However, the cross-over can occur where calcium is being removed from the soil solution by calcium carbonate precipitation, which explains the higher magnesium level in the lower soil horizons containing higher levels of calcium carbonate.

- The **percent rock content** within the proposed facilities area is the main deterrent for soil suitability based on the current DOGM guidelines. Appendix 2-3 states that native soils with a higher rock content than the current DOGM guidelines allow, can be salvaged. DOGM encourages salvaging **native soils** with **intrinsic or indigenous rock content**. Using these natural rocky soils should enhance reclamation success by providing an environment similar to native conditions. Natural, intrinsic rock content provides for a more stable reclaimed surface, aids

in water harvesting and water holding capacity of interstitial soils, and creates wildlife habitat and niches on the surface were surface boulders and larger cobble sized rocks are placed. However, care must be taken to avoid higher rock content in surface soils than is present in the undisturbed surface. Every effort should be made to minimize mixing the deeper subsoils containing extremely higher rock content with the surface soils and shallow subsoils containing lower amounts of rock.

### **Substitute Topsoil**

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

### **Findings:**

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

## **LAND-USE RESOURCE INFORMATION**

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

### **Analysis:**

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

Boundaries of the Turtle Canyon Wilderness Study area and the areas identified in the 1999 wilderness inventory as having wilderness characteristics, both discussed below, are shown on Plate 4-4.

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

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

The land is zoned by Emery County for mining and grazing. A small portion of the proposed permit area addition overlaps with the Turtle Canyon Wilderness Study Area. The application contains a copy of the 1993 environmental assessment prepared for management of the Turtle Canyon Wilderness Study Area, and it says underground mining would be acceptable in this area.

The Bureau of Land Management's 1999 Utah Wilderness Inventory identifies areas with wilderness character in addition to the previously-identified wilderness study areas. One of these areas overlaps the proposed addition to the permit area including the proposed disturbed area. The application includes copies of two memoranda from the Bureau of Land Management. One of these says, "While the planning process is being completed on lands found to have wilderness characteristics in the 1999 Wilderness Inventory, the management prescriptions of existing land management plans do not change." Therefore, it appears the Bureau of Land Management will be managing these lands as in the past until further assessment has been completed.

There has been some previous mining activity in Lila Canyon, but it is unknown how much coal was mined. The road on the bottom of Lila Canyon was built in the 1950's to provide access for coal exploration. There is a sealed portal in the left fork of the canyon where the Sunnyside Seam was exposed and coal mined, and the coal was probably transported back through the Horse Canyon Mine. It is believed mining occurred during the 1970's or early 1980's. If mining occurred during this time period, it should have been regulated under Title V of SMCRA.

**Findings:**

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

**ALLUVIAL VALLEY FLOORS**

Regulatory Reference: 30 CFR 785.19; 30 CFR 822; R645-302-320.

**Analysis:**

An assessment of the permits area by the regulatory authority concludes there are no alluvial valley floors that could be affected by mining. The premining land use is undeveloped rangeland which is not significant to farming; There is no farming activity upstream or downstream of the permit area, therefore, the proposed operations will not interrupt, discontinue, or preclude farming on an alluvial valley floor. The only potential of subirrigation is in very small area along upper perennial reaches of Little Park Wash, however these areas are very small with no chance of farming activities taking place.

**Findings:**

A determination of no alluvial valley floors exists in or adjacent to the permit area that can be impacted by mining operations.

**PRIME FARMLAND**

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

**Analysis:**

A Prime Farmland site investigation was performed by the Natural Resources Conservation Service (NRCS). A determination was made that no Prime Farmland or farmland of statewide importance were found within the proposed Lila Canyon coal lease area and support facilities area because there is no developed irrigation system on arid soils. The determination letter from the NRCS dated June 8, 1998, was sent to Environmental Industrial Services and is included in Appendix 2-1.

**Findings:**

Sufficient information has been submitted for this section.

**GEOLOGIC RESOURCE INFORMATION**

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

**Analysis:**

The permittee states (Section 100-122) that referenced materials not on file at the Division or readily available to the Division will be provided upon request.

Outside sources are referenced many times in Chapters 6 and 7 and their appendices. Many of the publications cited are probably available to the Division and the general public through libraries. References are provided at the end of chapter and appendices. The citation in Chapter 7 for Waddell and others, 1983 (p. 11) is not complete. References in Appendix 7-3 to Balsley, 1981 (p. 5) and Sieler and Baskins, 1986 (p. 4) are not complete, but refer to the Horse Canyon MRP where the original cite is located.

Geologic information includes a description of the geology of the proposed permit and adjacent areas down to and including the stratum immediately below the lowest coal seam to be mined. The coal seams and adjacent strata comprise an aquifer that may be adversely impacted by mining. Geology may affect the occurrence, availability, movement, quantity, and quality of potentially impacted surface and ground water.

The application includes geologic information in sufficient detail to assist in determining the probable hydrologic consequences of the operation upon the quality and quantity of surface and ground water in the permit and adjacent areas, including the extent to which surface- and ground-water monitoring is necessary, and whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area. Current information is not sufficient to assist in determining all potentially acid- or toxic-forming strata down to and including the stratum immediately below the coal seam to be mined and determining whether reclamation can be accomplished, but excavated or mined materials will be examined and tested as necessary to determine acid- and toxic-forming potential (Section 536). Geologic information is sufficient to assist in preparing the subsidence control plan.

Required resource maps and plans and detailed site specific information are based on published geologic information, permit applications of the adjacent Sunnyside and South Lease areas, and drilling

records of U. S. Steel Corporation and the Los Angeles Department of Power and Water. Some of these are included in the Lila Canyon Significant Revision, others are readily available, but some of the information is proprietary or otherwise not readily available to the Division and public.

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

An unsuccessful attempt was made to convert S-26, S-28, and S-31 to ground-water observation wells. S-26 and S-31, located south of the Williams Draw Fault, were offset with shallow piezometers A-26 and A-31 to observe ground water in the alluvium (Table 6-3). Table 6-3 does not indicate that these wells have been plugged and abandoned; however, the permittee has no data on A-26 and A-31 (Section 6.5.1, p. 21) and considers these wells unusable for ground-water monitoring (Section 724.100).

S-32 was drilled in 1981 and completed as a piezometer in the Grassy Member of the Blackhawk Formation. The location of S-32 is not known to the permittee and therefore not shown on any map: it can be determined from the log in Appendix 6-1 that it is in T. 17 S., R. 15 E. but the section cannot be identified. The permittee states that other than the log there are no other geologic or piezometric data from S-32 (Section 6.5.1, p. 21).

The Horse Canyon Well and the MDC (Minerals Development Corporation) well shown on Plate 7-1 were bored in Horse Canyon to monitor water in the alluvium (Section 6.5.1 Lila Canyon Significant Revision). There are no logs or other geologic or hydrologic data from these wells in the Lila Canyon Significant Revision (724.100).

In 1993 and 1994 IPA-1, IPA-2, and IPA-3 were drilled. Results of proximate and ash analyses of "floor" and "roof" from IPA-1, IPA-2 (roof only), and IPA-3 are in Appendix 6-2; however, the analysis reports show these are coal samples, not samples from strata overlying and underlying the coal seam. There are also proximate, ultimate, sulfur (total and pyritic), ash, and several other analyses for "middle" coal samples from the three bore holes.

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

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

Access to the underground workings of the Lila Canyon Mine will be provided by two rock slopes driven upwards from the base of the cliff to the coal seam. Rock that will be removed from the tunnels will be called "slope rock", and it fits most closely into the classification of underground development waste. The slope-rock underground development waste will contain mostly shale,

sandstone, and mudstone. Traces of coal may be found, but the permittee feels the amount will be insignificant.

Slope-rock will be used to fill in areas to be used as pads in the coal pile storage areas, with any additional being placed in the refuse pile: sandstone materials may be crushed and used for gravel (Section 528.320), although the use for the gravel is not described.

The slope-rock material will be examined and tested as necessary to determine acid- and toxic-forming potential (Section 536). The Lila Canyon Significant Revision contains no reports of analyses for acid- or toxic-forming or alkalinity-producing materials and their content in the strata immediately above and below the coal seam to be mined, including the rock through which the tunnels will be built. The permittee states that with over 100-years of mining experience at the adjacent Sunnyside Mines there have been no proven problems with acid- or toxic-forming materials (Section 6.5.5.1). The reclamation plan specifies 4 feet of undifferentiated subsoil and topsoil will be placed over the refuse pile. The slope-rock underground development waste used to build the pads will be left in place for final reclamation and buried with 4 feet of undifferentiated subsoil and topsoil (Chapters 2, 5, and 7, and Appendix 5-7).

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

The coal seam crops out at approximately 6,500 feet in the vicinity of the rock-slope tunnels. The Lila Canyon Significant Revision indicates the tunnels will intercept the coal seam at approximately 6,300 feet.

Underground mining always has a potential for impacting surface-water, ground-water, and other surface resources. The permittee states in Section 721 that subsidence effects are expected to be minimal due to the amount of cover and massive rock strata between the mining and the surface. Coal-seam elevations determined from bore holes are on Plate 6-4 - Cover and Structure Map.

The permittee has made no request to the Division to waive in whole or in part the requirements of the borehole information or analysis required of this section.

#### **Findings:**

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

## **HYDROLOGIC RESOURCE INFORMATION**

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

**Analysis:****Sampling and analysis**

The permittee states that all water-quality analyses performed to meet the requirements of R645-301-723 through -724.300, -724.500, -725 through -731, and -731.210 through -731.223 will be conducted according to the methodology in the current edition of "Standard Methods for the Examination of Water and Wastewater" or the methodology in 40 CFR Parts 136 and 434. Water-quality sampling will be conducted according to either methodology listed above when feasible (Section 723).

The surface-water monitoring point-source discharge will be conducted in accordance with 40 CFR Parts 122 and 123, R645-301-751 and as required by the Utah Division of Water Quality for Utah Pollutant Discharge Elimination System (U.P.D.E.S.) permits. A U.P.D.E.S. discharge permit application has been submitted to the Division of Environmental Health for the proposed sediment pond and mine water for the Lila Canyon operation. Existing U.P.D.E.S. permit applications for the Lila Canyon Lease are provided in Appendix 7-5. parameters are shown in Table 7-4. Water monitoring locations and sample frequencies are described in Table 7-3 and on Plate 7-4 .

As indicated in Section 731.220, surface-water monitoring data will be submitted at least every 3 months for each monitoring location. When analysis of any surface water sample indicates non-compliance with the permit conditions, the company will promptly notify the Division and immediately take actions to identify the source of the problem, correct the problem and, if necessary, to provide warning to any person whose health and safety is in imminent danger due to the non-compliance.

**Baseline information**

The U.S. Geological Survey conducted a water quality study in Horse Canyon Creek from August 1978 until September 1979, during the time that U.S. Steel operated the mine. Each month, field parameters were measured and samples were collected and analyzed for most major anions and cations. Additional analyses for metals, nitrogen and minor chemical constituents were done on a quarterly or less frequent basis. This is briefly mentioned in Appendix 7-3, and a summary of this monitoring is in Appendix 7-2.

Between January 1981 and April 1983, baseline water quality data were collected for surface water sites B-1 (HC-2), HC-1 (HCSW-1, HSW-1), RF-1 and spring site RS-2 (Redden Spring) on the Horse Canyon permit area. Between 14 and 19 samples, depending on the site, were taken and analyzed during the monitoring period (Appendix 7-2). The permittee has stated that selection of the parameters that were measured was based on 30 CFR 783.16 (Page 2, Appendix 7-3), which rule was removed from the federal rules in September 1983 and effectively replaced by 30 CFR 780.21(b)(2) and corresponding Utah Coal Mining Rules, except that acidity and dissolved iron are no longer required parameters. B-1 (HC-2), HC-1 (HCSW-1, HSW-1), and RF-1 - but not RS-2 - were visited monthly from March through September during 1989 and, when there was flow, samples were collected and analyzed for most of the parameters in UDOGM's current guidelines (Appendix 7-2). These sites have been monitored since 1989 in accordance with the approved water monitoring plan in the Horse Canyon Mine MRP and monitoring results have been submitted to UDOGM each year in Annual Reports.

There are two water-monitoring sites identified as HC-2 in different parts of the MRP, and this is explained in Section 731.220. Surface- water monitoring site B-1 is referred to as HC-2 on the 1997 field data sheets in Appendix 7-2: on Plate 7-1 this site has been labeled B-1, with (HC-2) added in parentheses. The designation HC-2 is also associated with spring H-2 in Appendix 7-6. On Plate 7-1 this site has been labeled H-2 and (HC-2) added in parentheses.

Baseline monitoring of the Intermountain Power Agency (IPA) South Lease, which generally corresponds with the Lila Canyon Significant Revision area, was done by EarthFax Engineering in 1993-1995. The data are in Appendix 7-6.

Analysis for total manganese, a mandated parameter, has been inconsistent but some of the analysis results in Appendices 7-2 and 7-6 of the Lila Canyon Significant Revision do include total manganese. Appendix 7-2 includes the 1997 Annual Horse Canyon Mine Hydrologic Monitoring Report with copies of the laboratory reports for Redden Spring (RS-2), HC-1 (HCSW-1, HSW-1), HC-2 (B-1), and RF-1: the 1997 quarterly samples were analyzed for all Tech 004 parameters except total manganese and acidity. Data from Appendix VI-I of the Horse Canyon Mine MRP have been added to Appendix 7-2 of the Lila Canyon Significant Revision.

Annual reports were reviewed back to 1993: manganese has been reported but it is not clear whether this was total or dissolved. Table 1 (Table 1 from the 1986 UDOGM guidelines) in Appendix VI-5 of the current Horse Canyon Mine MRP specifies that both dissolved and total manganese will be determined as part of operational monitoring of surface water; however, Table 3 (Table 3 from the 1986 UDOGM guidelines) in Appendix VI-5 specifies that only dissolved manganese will be determined for operational monitoring of ground water, so at least for the ground-water samples the reported values should be for dissolved manganese. The operational parameter lists in Tables 7-4 and 7-5 of the proposed Lila Canyon Significant Revision are much clearer, and following them should eliminate this confusion and produce more clear and consistent monitoring analysis results and reports.

### **Ground-water information**

#### *Wells and bore holes*

An unsuccessful attempt was made to convert bore-holes S-26, S-28, and S-31 to ground-water observation wells in 1980. S-26 and S-31, located south of the Williams Draw Fault, were offset with shallow piezometers A-26 and A-31 to observe ground water in the alluvium (Table 6-3): it is not clear from Table 6-3 whether or not these wells have been plugged and abandoned or if they are available for ground-water monitoring; however, the permittee has no data on A-26 and A-31 (Section 6.5.1) and considers these wells unusable (Section 724.100).

Two other wells (Plate 7-1) were bored in Horse Canyon to monitor water in the alluvium (Section 6.5.1 Lila Canyon Significant Revision). The Horse Canyon Well near the main Horse Canyon facilities will be used during mining and reclamation operations and sealed after reclamation is complete. To the permittee's best knowledge, the MDC well (Table 7-2) located near the road junction has already been sealed. There are no logs or other geologic or hydrologic data from these wells in the Lila Canyon Significant Revision (724.100).

S-32 was drilled in 1981 and completed as a piezometer in the Grassy Member of the Blackhawk Formation. Its exact location is not known. The Lila Canyon Significant Revision contains no data on ground-water elevation or quality for S-32 and the permittee states that other than the logs in Appendix 6-1 there are no geologic or piezometric data from S-32 (Section 6.5.1, p. 21).

In 1993 and 1994, IPA-1, IPA-2, and IPA-3 (Plate 7-1) were drilled. Water-levels were measured seasonally by IPA in 1994, 1995, and 1996 to provide baseline data (Appendix 7-1) for the South Lease. Data have not been collected since, but the permittee commits to resuming water-level monitoring upon approval of the Lila Canyon Significant Revision (724.100, Table 7-3). A commitment is made on page 8 (Chapter 7) to resume monitoring of these wells in July 2000: no data have been received by UDOGM for this recent monitoring, neither with the most recent version of the plan revision nor with the quarterly reports.

### *Seeps and springs*

Locations of all known seeps and springs are shown on Plate 7-1 (Section 722.200). Names or numbers used to identify springs and seeps are sometimes different in Appendices 7-1, 7-2, and 7-6 and on the maps. The table below correlates the various names, dates, and types of data.

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

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

Appendices 7-1 and 7-6 contain seasonal information on ground-water quality and flow for seeps and springs 1 (S-1), 9 (S-9), 10 (S-10), 14 (S-14), 16 (S-16, 16Z), HC-2 (H-2), HC-4 (H-4), HC-9 (H-9), HC-11 (H-11), HC-13 (H-13), HC-14 (H-14), and HC-18 (H-18). Data are from work done in 1993, 1994, and 1995 by EarthFax Engineering for IPA. Water-quality descriptions include total dissolved solids or specific conductance corrected to 25°C, pH, total iron, and total manganese. Most other parameters listed in UDOGM directive Tech 004 were determined in these samples; however, total hardness, acidity, and total alkalinity were not reported. Total rather than dissolved concentrations were determined for all metals.

EarthFax also identified springs and seeps 1A, 1B, 2, 3, 3A, 3B, 3C, 3D, 4, 5, 6, 7, 8, 8A, 8B, 9R, 10A, 11, 12, 12A, 12B, 12C, 12D, 12E, 13, 13A, 13B, 13Z, 14A, 15, 15A, 15B, 15C, 16A, 16B, 16C, 17, 17A, 17B, 18, 19A, 19B, 19C, 20, and 22. These were dry or had low flows at the time of the quarterly visits and no water-quality analyses were done (Appendix 7-1). 8B, 15A, 17B, and 19C could neither be found on Plate 7-1 nor matched with another identified seep or spring.

RS-1 and RS-2 were sampled once a year during 1978, 1979, and 1980 and analyzed for most major chemical constituents. Data are in Appendix VI-1 of the current Horse Canyon Mine MRP.

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

## GROUND-WATER MONITORING SITES

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

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

## GROUND-WATER MONITORING SITES

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

Name		Appendix 7-2				Appendices 7-1 and 7-6							App 7-2	Water Right	
Utah American Energy	JBR - EarthFax	1978 - 1980 (Geneva)	1981 - 1983 (Geneva)	1985 (JBR)	1989 (Kaiser)	1993 (EarthFax)		1994 (EarthFax)			1995 (EarthFax)			1997 Annual Report	(Spring Name)
				Nov		May	Oct	May	Aug	Oct	May	Aug	Oct	quarterly	
	3D								D	S	F	F	F		
	4					F	D	F	D	Flow	F		D		
	4A						F	F					D		
	5					F	D	F	D	S	F	S			
	5A						D								
	6					D	F	S	S	S		F	F		
	6A						D								
	7					F	F	F	S	Flow	S	F	F		
	7A						F								
	8					F	F	F	F	F	F	F	F		
	8A					F	F		D	Flow	F	F	F		
	8B						F		D						
L-7-G	9 (S-9)					F, L	F, L	F, L	F, L	F	F, L	F, L	F, L		91-399 91-2537 91-2521 (Cottonwood)
	9R					F			D		F	F	F		
L-8-G	10 (S-10)					F, L	F, L	F, L	F, L	F	F, L	F, L	F, L		91-808 91-2538
	10A											F	F		
	11					F	F	F	W		S, F	F	F		
	12									F	F	S	S		
	12A					F	F	F	F	F	F	F	F		
	12B					F	F	F	F	F	F	F	F		
	12C					F	F	F	W	F	F	S	S		
	12D					F	F	S	D	F	S, F		D		
	12E								S	S	F	W	F		
	13					F	F	F	W, L	F	F	W	F		
	13A					F	D		D	D	D	D	F		
	13B					F	F	F	W	S	F	W	F		
	13Z					F	F	S	W	S	F	F			
L-10-G	14 (S-14)					F, L	F, L	F, L	F, L	F	F, L	F, L	F, L		91-809 91-2535
	14A					F	D	D	D	S	D	W	W		
	15					F	D	D	D	D	W	D	D		
	15A					F	F	F	W	F	F	W	W		
	15B					F	S	D	D	S	D	D	D		
	15C					S	S	S	D	D	D	W	D		
L-9-G	16(Z) (S-16)					S, L	F, L	F	F		F, L	F, L	F, L		91-2539 (Pine)

### GROUND-WATER MONITORING SITES

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

Name		Appendix 7-2				Appendices 7-1 and 7-6						App 7-2	Water Right		
Utah American Energy	JBR - EarthFax	1978 - 1980 (Geneva)	1981 - 1983 (Geneva)	1985 (JBR)	1989 (Kaiser)	1993 (EarthFax)		1994 (EarthFax)			1995 (EarthFax)			1997 Annual Report	(Spring Name)
				Nov		May	Oct	May	Aug	Oct	May	Aug	Oct	quarterly	
	16A					F	F	F, L	D	D		D	D		
	16B					F	D	D	D	D		D	F		
	16C					S	D	D	D	D	F	D	S		
	17					F	F	F	W	F	F	S	S		
	17A					F	D	S	D		W	S			
	17B (abandoned 10/26/94)					F			D						
	18					F	D	F	W	F	F	F	S		
	18A						F								
	19														
	19A					F	F	F	D	S	F	S	W		
	19B					F	F	F	D	F	F		F		
	19C						F	F	D						
	20					F	D	S	S	F	S	W	D		
	21														
	22					D	F	F	W	D	W	D			
	RS-1														91-4959 (Redden)
	RS-2	L	R											F, L	91-4959 (Redden)
															91-810
															91-2517
															91-2518 (Williams)
															91-2519
															91-2520

### WELLS

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



### Surface-water information

Within and adjacent to the permit area, surface water resources consist of three main intermittent drainages: Horse Canyon Creek, Lila Canyon Creek, and Little Park Wash (Section 724.200). The permittee states in Section 722.200 that the location of all known seeps and springs, as well as watering ponds or tanks are shown on Plate 7-1; however, there are no watering ponds and tanks evident on the map and UDOGM is not aware of any in the area. The permittee states that there are no streams, lakes or ponds, or irrigation ditches known to exist within the proposed permit or adjacent areas (Section 722.200).

Range Creek drainage is the perennial stream nearest to the Horse Canyon Mine permit area. It is approximately 6 miles east of the proposed Lila Canyon area and separated from it by the drainage divide at the top of the Roan Cliffs. Because of the distance from the Soldier Canyon Mine, there has been no collection of baseline from Range Creek (Section 724.200).

The main drainage through the permit area, Little Park Wash, is described briefly in Section 724.200 and in Table 7-2. There are no baseline water-quality data for the main channel in Little Park Wash. There has been no flow observed during quarterly observations in 1998 and 1999 (Section 724.200). Spring flows in this drainage evaporate or infiltrate into the alluvium before reaching the main channel. Channel flow most likely occurs only when there are thunderstorms or rapid snowmelt.

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

It states in Section 724.200 that "Flows in Horse Canyon, generally, are limited to the early spring period (Lines and Plantz, 1981). By late spring to early summer, usually no flow is evident in Horse Canyon Creek, below the minesite or Lila Canyon Creek." Flow monitored in the valley at B-1 (HC-2) in 1989 was intermittent (Appendix 7-2). Discharge from the mine to Horse Canyon Creek at 001 and 002 appears to have been constant from May 1981 to June 1983, although flows were typically small. Flow volume at discharge point 003 below the mine was not reported, although water samples were collected throughout the 3-year period. Any surface-water data from this period, or earlier, would mainly be mine-discharge water rather than surface runoff. There was no reported flow from 003 from 1983 until reporting ceased in 1991.

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

Water rights are listed in Table 7-2. Locations of water rights are on Plate 7-3.

### Baseline cumulative impact area information

Much of the hydrologic and geologic information that is necessary to assess the probable cumulative hydrologic impacts of the proposed operation and all anticipated mining on surface- and

ground-water systems for the cumulative impact area is probably available from federal and state agencies. Any needed information that is not available from such agencies may be gathered and submitted by the permittee as part of the permit application. As discussed already, outside sources are referenced many times in Chapters 6 and 7. Baseline data are missing or insufficient for most proposed surface- and ground-water monitoring points. The permit cannot be approved until the necessary hydrologic and geologic information is available.

### **Modeling**

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

### **Alternative water source information**

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

As noted in the table, the majority of rights are owned by UtahAmerican Energy, Inc. for industrial use. Other rights owned by the B.L.M. or individuals are primarily for stockwatering.

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

### **Probable hydrologic consequences determination**

Appendix 7-3 contains a determination of the PHC of the proposed operation based upon the quality and quantity of surface and ground water under seasonal flow conditions for the proposed permit and adjacent areas. The PHC determination is based on baseline hydrologic, geologic, and other information collected for the permit application, but not on data statistically representative of the site. The permittee finds in the PHC determination that, based on available data and expected mining conditions, the proposed mining and reclamation activity is not expected to proximately result in contamination, diminution or interruption of an underground or surface source of water within the proposed permit or adjacent area that is used for domestic, agricultural, industrial or other legitimate purpose.

The permittee has determined that within the Lila Canyon Significant Revision area the general seasonal streamflow is ephemeral. The streams generally dry up by late spring, with only occasional runoff during the summer as the result of rainfall events (Appendix 7-3, page 7).

The permittee has determined that, due to the close proximity and similarities of mining and drainage conditions, water quality and impacts to the channels from pumping the Lila Canyon Mine would be very similar to those experienced in the adjacent Horse Canyon Mine. There are no pre-mining data for Horse Canyon, so the determination of impacts in Horse Canyon is based on water monitoring results and on the absence of reports of negative impacts (Section 6.5.5.1 - page 39). Channel morphology and characteristics will be determined before water is discharged from the mine to

Lila Canyon, and impacts to Lila Canyon from mine water discharge can then be documented and, if necessary, reduced or eliminated (pages 25 and 26). Water discharged to Lila Canyon will be sampled and analyzed. If the natural quality of the discharge water does not meet UPDES standards, the water will be treated prior to discharge (pages 28, 30).

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

Although subsidence has the potential to alter the groundwater flow regime in the area, several factors tend to limit the effects of subsidence on the groundwater regime. Most of the local springs flow from perched systems in the North Horn Formation and are separated from the underlying regional aquifer. The North Horn contains swelling clays that tend to heal small fractures. Finally, the perched aquifers are lenticular and discontinuous so there is a great probability that fractures in one area will not drain all the different aquifers.

Springs are used by wildlife and livestock and are mostly located upstream of the permit areas or are in areas where subsidence resulting from post-1977 mining has not been documented and is not expected. Current conditions of springs and seeps reflect the impacts (if any) of 50 years of mining, as well as pre-mining conditions.

The permittee has determined that it is unlikely there will be any measurable impacts from the mining and reclamation activities at the Lila Canyon. Pre-mining data are not available (Section 724.100), but depletion of ground-water flow and quality during operation of the Horse Canyon Mine is not indicated by monitoring results, such as those in Appendices 7-2 and 7-6, and the permittee has found no reports of depletion due to subsidence in the Horse Canyon permit area. Springs above the mine should continue to flow, with fluctuations that are related to variations in recharge rather than mining and subsidence.

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

In the PHC the permittee finds that, based on available data and expected mining conditions, the proposed mining and reclamation activity is not expected to proximately result in contamination, diminution or interruption of any underground or surface source of water within the proposed permit or adjacent areas; however, acid-forming or toxic-forming materials and flooding or streamflow alteration are two subjects that will require further investigation as mine construction and operation proceed.

### **Ground-water and Surface-water Monitoring Plans**

The permittee has based the ground-water and surface-water monitoring plans on the PHC determination and the analysis of baseline hydrologic, geologic, and other information in the permit application. Water samples from seeps, springs, and streams will be analyzed for the parameters listed

in Tables 7-4 and 7-5. The parameters in Tables 7-4 and 7-5 match those in UDOGM directive Tech 004. Monitoring reports will be submitted to UDOGM at least every three months, within 30 days following the end of each quarter.

The permittee's water-monitoring plan is intended to provide data to show impacts to potentially affected springs, seeps, impoundments and drainages within and adjacent to the permit area by comparison with relevant baseline data and with applicable effluent limitations. The permittee has selected monitoring locations and frequencies, described in Table 7-3, so that significant springs, seeps, impoundments and drainages that could potentially be impacted by the mining and reclamation operations will be monitored on a regular basis. (Section 731.222.1).

### **Ground-water monitoring plan**

Nine sites are proposed for ground-water monitoring: L-5-G through L-10-G and IPA 1, 2, and 3. They are listed in Table 7-3 and locations are shown on Plate 7-4. Seeps and springs will be monitored quarterly for parameters listed in Table 7-5. Station L-5-G is the potential mine discharge point and will be monitored in accordance with UPDES Permit requirements. IPA 1, 2, and 3 will be monitored quarterly for depth.

Stations L-6-G through L-10-G are significant springs located over the area of proposed mining. The relationship of these springs to seeps and springs monitored previously by JBR Consultants, EarthFax Engineering, and others is partially described in Table 7-3.

Four of the springs proposed for operational monitoring are identified by the permittee as L-7-G, L-8-G, L-9-G (Pine Spring), and L-10-G and correspond with the springs monitored by EarthFax as 9, 10, 16(Z), and 14, respectively. Appendices 7-1 and 7-6 of the Lila Canyon Significant Revision contain data on Springs 9, 10, 14, and 16(Z) from 1993, 1994, and 1995, when they were monitored for baseline for the South Lease by IPA. There is a commitment on page 30 (Chapter 7) to resume monitoring in July 2000 to establish a current baseline and assure the sites are viable, but no recent data were submitted.

L-6-G is in the vicinity of Mont Spring, water right 91-617, and Leslie Spring, water right 91-618. These water rights correspond closely to JBR sample sites H-21 and H-19 and are near H-20, H-21A, H-21B, and H-22; however, the only monitored site with consistent flow in this area is downgradient at H-18. H-18 is therefore the site that has been selected by the permittee to monitor ground water in this area.

The spring to be monitored by the permittee at L-7-G was monitored as 9 (S-9) from 1993 to 1995. Spring 9 is near springs 8, 19-A, and 19-B and has had the most consistent flow of the group. Baseline data for Spring 9 are in Appendices 7-1 and 7-6. The permittee identifies this as Cottonwood Spring, which is associated with water right 91-2521 in Table 7-2; however, the location for water right 91-2521 described in Table 7-2 - NE/4 Sec. 13, T. 16 S., R. 14 E. - is possibly incorrect because that area is a topographic high and there are no identified springs at that location. Water rights 91-399 and 91-2537 are closer to springs 8, 9, 19-A, and 19-B.

IPA 1, 2, and 3 will be monitored quarterly for water levels. A-26 and A-31 were bored as offsets to S-26 and S-31 to observe ground-water levels in the alluvium south of the Williams Draw Fault. Table VI-3 does not indicate that these wells have been plugged and abandoned; however, the

permittee has no data on A-26 and A-31 (Section 6.5.1). S-32 was drilled in 1981 and completed as a piezometer in the Grassy Member of the Blackhawk Formation. The permittee considers A-26, A-31, and S-32 unusable (Section 724.100).

### **Surface-water monitoring plan**

Streams will be monitored monthly. Sediment pond and mine discharges will be monitored monthly or as frequently as discharges occur (Table 7-3). No monitoring is proposed for Little Park Wash, which had no observed flow during 1998 and 1999.

Intermittent drainages in the area flow in response to snowmelt and precipitation events. The proposed surface-water monitoring program will monitor Lila Canyon both above and below the disturbed mine site area at L-1-S, L-2-S, and L-3-S and the sediment pond discharge at L-4-S. There are no baseline data, even no-flow reports, for L-1-S, L-2-S, and L-3-S in Lila Canyon, nor for surface water anywhere in the Lila Canyon drainage. A monitoring program was implemented in July 2000 (pages 7 and 30) to collect current baseline data that would be continuous with the operational data which are to follow: no data have been received by UDOGM for this recent monitoring, neither with the most recent version of the plan revision nor with the quarterly reports.

Point-source discharge monitoring will be conducted in accordance with 40 CFR Parts 122 and 123, R645-301-751 and as required by the Utah Division of Environmental Health for UPDES permits. A UPDES discharge permit application has been submitted to UDOGM of Environmental Health for the proposed sediment pond and mine water for the Lila Canyon operation. UPDES permit applications for the Lila Canyon Mine are provided in Appendix 7-5.

### **Findings:**

Hydrologic Resource Information is not considered adequate to meet the requirements of this section. Prior to approval the permittee must provide the following information:

**R645-301-724**, water-levels in IPA-1, IPA-2, and IPA-3 were measured seasonally by IPA in 1994, 1995, and 1996 to provide baseline data (Appendix 7-1) for the South Lease. Surface-water quality and quantity was monitored at L-6-G, L-7-G, L-8-G, L-9-G, and L-10-G in 1993, 1994, and 1995. There are no baseline data, even no-flow reports, for L-1-S, L-2-S, and L-3-S in Lila Canyon, nor for surface water anywhere in the Lila Canyon drainage. A monitoring program was implemented in July 2000 (pages 7 and 30) to collect current baseline data that would be continuous with the operational data which are to follow: no data have been received by UDOGM for this recent monitoring, neither with the most recent version of the plan revision nor with the quarterly reports.

## **MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION**

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

**Analysis:****Affected Area Boundary Maps**

Plate 1-1, Permit Area Map, shows the permit boundaries that are the same as the affected area boundaries for the Horse Canyon Mine. The Horse Canyon Mine includes the Horse Canyon project and the Lila Canyon project. Plate 5-5, Mine Map, shows the affected area boundaries for the Lila Canyon project and the timing and sequence of mining.

All cross sections, maps and plans required by R645-301-722, and R645-301-731.700 have been prepared and certified according to R645-301-512. Contour Maps of the proposed disturbed area and mining areas are included as Plates 5-2A, 5-2B, 7-1 and 7-2. These maps are U.S.G.S. based contours and accurately represent the proposed permit and adjacent areas. Disturbed area maps are based on aerial photography for greater detail, and are tied to relevant U.S.G.S. elevations.

**Archeological Site Maps**

The locations of cultural and historic resources in the area are shown on Plate 4-3 and on maps in Appendix 4-1. This information is adequate but needs to be kept confidential.

**Coal Resource and Geologic Information Maps**

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

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

The coal seam crops out at approximately 6,500 feet in the vicinity of the rock-slope tunnels. The Lila Canyon Significant Revision indicates the tunnels will intercept the coal seam at approximately 6,300 feet. Coal-seam elevations determined from bore holes are on Plates 6-2, 6-3, and 6-4.

**Existing Structures and Facilities Maps**

Plate 5-1A, Pre Mining Contours, shows the existing structures in the proposed Lila Canyon disturbed area. The only existing structure is a 36" culvert scheduled to be replaced when the mine facilities area constructed. A description of the culvert is given in Section 526.110 and 521.120 of the PAP.

### **Existing Surface Configuration Maps**

The pre mining contour map Plate 5-1A. That plate has a scale of 1 inch equals 100 feet and 5 foot contour intervals. Other maps such as Plate 1-2, Plate 5-2 and Plate 5-6 also show the pre mining contours.

If the revised maps were made from aerial photography then the permittee needs to give the Division a copy of those photographs. The photographs would be important if the Division were to reclaim the site under forfeit. A permit can change hands several times during the life of the mine, therefore the Division wants to get the aerial photograph while the current permittee has access to the photographs.

The permittee shows the existing surface contours on Plate 5-1A. The contours on Plate 1-2, Plate 5-1A, Plate 5-2 and 5-6 have been done with scales of 1 inch equals 100 feet and 5 foot contour intervals. The permittee is responsible for giving the Division all relevant information including aerial photographs.

### **Mine Workings Maps**

Plate 5-1 shows the old mine workings in and around the permit area, including the Horse Canyon project and the Lila Canyon project. The mine openings at the Horse Canyon surface facility have been sealed and are scheduled to be backfilled. The proposed portals and mine workings for the Lila Canyon Mine will be discussed in the operation and reclamation sections of this TA.

### **Monitoring Sampling Location Maps**

The permit application package identifies that the location of all known seeps and springs, as well as watering ponds or tanks are shown on Plate 7-1. There are no streams, lakes or ponds or irrigation ditches known to exist within the proposed permit or adjacent areas.

### **Permit Area Boundary Maps**

Several maps including Plate 5-1 show the location of the permit boundaries for the Horse Canyon mine. The permit boundary has been divided into Permit Area A and Permit Area B. These areas have been identified on Plate 5-1, which also indicates that Permit area B is a significant revision to the Horse Canyon Permit. Plate 4-4 identify the areas on and adjacent to the Horse Canyon Mine that are designated Wilderness Study Areas (WSA's) currently being evaluated by the Bureau of Land Management for wilderness potential. Two WSA's lie within and adjacent to the proposed significant revision area. The Turtle Canyon WSA encompasses the eastern half of the SR and the Desolation Canyon WSA extends up from the south to encompass the south-eastern part of the SR.

### **Surface and Subsurface Ownership Maps**

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

### **Subsurface Water Resource Maps**

Ground water was encountered in several bore holes as well as in the Horse Canyon Mine. Water-level elevation contours are on Plate 7-1; otherwise, areal and vertical distribution of aquifers within the proposed permit or adjacent areas is not shown on a map. Seasonal variation in the water levels is tabulated in Appendix 7-1 for the IPA wells, but there is no portrayal of seasonal differences of head on cross sections and contour maps.

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

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

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

Water rights are listed in Table 7-2. The list includes Redden Spring plus springs identified as Mont, Leslie, Cottonwood, Williams, Kenna, and Pine. In addition there are eleven unnamed springs listed, plus a well. Locations are on Plate 7-3. Some locations described in applications filed with the Division of Water Rights, and used by the permittee in preparing Table 7-2 and Plate 7-3, are imprecise. Some locations correspond roughly with springs shown on Plate 7-1, but it is often unclear whether or not they are the same spring. There are several springs listed in Table 7-2 and shown on Plate 7-3 that are not shown on Plate 7-1, or at least do not correspond to any spring shown on Plate 7-1.

### **Surface Water Resource Maps**

As mentioned above, the old Horse Canyon Mine is known to have standing subsurface water. In addition, any drill holes that have encountered water have been noted. Relevant cross sections of drill holes are shown on Plate 6-5. Water monitoring wells are shown on Plates 6-5 and 7-1 and results are included in Appendix 7-1.

### **Vegetation Reference Area Maps**

Figure 1 in the 1999 vegetation study is a map showing the vegetation communities in relation to the proposed disturbance. Plate 3-2 shows vegetation communities of the proposed addition to the permit area

### Well Maps

Three water monitoring wells were drilled in the area, IPA #1, IPA #2 and IPA #3, to monitor mine water levels. These wells are shown on Plate 7-1.

### Contour Maps

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

### Findings:

Information provided in the proposed amendment is not considered adequate to meet the requirements of this section. Prior to approval, the permittee must provide the following in accordance with:

**R645-301-521.190** The permittee must give the Division copies of the aerial photographs that show the predisturbed area. If the Division were to reclaim the site, those photographs would be helpful in restoring the area. The permittee is responsible for giving the Division copies of all relevant data including aerial photography.



# **OPERATION PLAN**

## **MINING OPERATIONS AND FACILITIES**

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

### **Analysis:**

#### **General**

The permittee proposes to develop a surface facility and mine portals in Lila Canyon. The permittee wants to develop the Lila Canyon facilities because access to the coal through the Horse Canyon portals is not feasible.

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

#### **Type and Method of Mining Operations**

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. The ventilation fan portal will be driven from underground workings to the surface.

Mining will be conducted by room-and-pillar methods in the Sunnyside Seam. Production in the first year is estimated to be 200,000 tons, the second to fifth year 1,000,000 to 1,500,000 tons per year. If demand increases, the permittee will install longwall equipment and production could peak at 4,500,000 tons per year. The mine is scheduled to end operations in 2024, the life-of-mine will be 20 years.

In Appendix 4-3, Air Quality, the permittee stated in a letter dated August 27, 1999 to the Division of Air Quality that a maximum of 1,500,000 tons will be produced every year. In Section 523 the permittee states that a production in the first year should be 200,000 tons. In the second through fifth year production will be between 1,000,000 to 1,500,000 tons. If market condition warrant the permittee could choose to use longwall equipment and production could increase to 4,500,000 tons per year. Before the use of longwall mining the permittee would have to get Division approval.

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

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

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

No major de-watering concerns are anticipated at this property. The workings are expected to produce some water with more water being produced as the depth of mining increases. 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.

In Section 523 of the PAP, the permittee listed the major mining equipment that will be used. The equipment is consistent with a major operation.

### **Facilities and Structures**

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

- Mine Facilities Road
- Security Shack
- Mine Substation
- Office/Bathhouse/Warehouse Parking Area
- Office/Bathhouse
- Mine Parking
- Shop Warehouse
- Non-Coal Waste Area
- Equipment & Supplies Storage Area
- Sewer Tank & Drain Field
- Water Treatment Plant
- Potable Water Tank
- Process Water Tank
- Topsoil Pile
- Refuse Pile
- Sediment Pond
- Slope Access Pond
- Rock Slopes
- Ventilation Fan
- ROM Underground Belt
- ROM Storage Pile
- Crusher
- Coal Storage Bin
- Truck Scale and Loadout

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

In Section 528.100 the permittee describes how the coal will be handled and stored. The permittee outlined the coal storage area on Plate 5-2. The maximum amount of coal that can be stored on the site will be determined by the air quality permit or by the size of the coal storage area on Plate 5-2.

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

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

#### **Findings:**

The permittee met the minimum requirements of this section.

### **EXISTING STRUCTURES:**

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

#### **Analysis:**

One existing culvert is shown on Plate 5-1A to be in the proposed disturbed area. The permittee states in Section 526.110 and Section 521.120 of the PAP that a 36" culvert exists in the proposed disturbed area. The culvert is in poor condition and will be replaced during construction.

#### **Findings:**

The permittee met the minimum requirements of this section.

### **PROTECTION OF PUBLIC PARKS AND HISTORIC PLACES**

Regulatory Reference: 30 CFR784.17; R645-301-411.

#### **Analysis:**

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

The Turtle Canyon Wilderness Study Area overlaps with the proposed addition to the permit area in the following locations:

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

Section 24, NE $\frac{1}{4}$  NW $\frac{1}{4}$ , N $\frac{1}{2}$  NE $\frac{1}{4}$

Township 16 South, Range 14 East  
Section 19, SE $\frac{1}{4}$  SW $\frac{1}{4}$ , Lots 3 and 4  
Section 30, SW $\frac{1}{4}$  NE $\frac{1}{4}$

The policy of the Bureau of Land Management is to not allow surface occupancy in wilderness study areas any more than absolutely necessary and only in cases where there are valid existing rights. The applicant has not proposed surface-disturbing activities in these areas, and considering the topography, the Bureau of Land Management feels it is unlikely exploration, ventilation shafts, or other disturbance would be practical. If the applicant proposes surface-disturbing activities in these areas, they will be scrutinized very carefully.

The Bureau of Land Management has prepared two environmental analyses discussing the anticipated effects of subsidence in these areas. If subsidence is expressed on the surface, it is likely to consist of a lowering of the land elevation with some surface cracks, and there could be some disruption of the hydrologic balance. Overall, however, the Bureau of Land Management felt the effects of undermining these areas would be small.

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

### **Findings:**

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

## **RELOCATION OR USE OF PUBLIC ROADS**

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

### **Analysis:**

In Section 521.133.1 of the Lila Canyon Amendment the permittee states:

"Emery County has given permission to conduct coal mining or reclamation operations within 100 feet of the county road." (See Appendix 1-4)

Appendix 1-4 contains a letter dated February 23, 2000 from the Emery County Planning Commission. The commission states that they will require the permittee to install a 6' chain link fence around UEI's activities at a distance of 100' from the public road as protection from any normal hazards generally associated with coal mining activities. Map 5-2 shows that the chain link fence will be next to the county road not 100' from the county road. The symbol for the chain link fence is not clearly identified on the map.

The Division is concerned about how close the sediment pond is to the public road (County Road 163). The Division needs to know what measures will be taken to protect the public from the hazards associated with the sediment pond and other mine facilities.

### **Findings:**

Information provided in the proposed amendment is not considered adequate to meet the requirements of this section. Prior to approval, the permittee must provide the following in accordance with:

**R645-301-526.116.1,** The permittee must show how the public will be protected from mining and reclamation activities constructed within 100 feet of the county road. Specifically the permittee must address how the public will be protected from the hazards associated with the sediment pond and other mine facilities.

**R645-301-526.116.1,** The permittee must modify the mine plan so that no mining activities occur within 100' of the county road. In the letter dated February 23, 1999 the Planning Commission required the permittee to place a 6' high chain link fence at a distance of 100' from the county road to protect the public. Map 5-2 shows that the chain link fence will be next to the road not 100' away from the road.

**R645-301-121.200,** The permittee must identify the symbol for the chain link fence on Map 5-2.

## **AIR POLLUTION CONTROL PLAN**

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

### **Analysis:**

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

### **Findings:**

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

## COAL RECOVERY

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

### Analysis:

The BLM developed an R2P2 for the Lila Canyon Mine. Part of the R2P2 is evaluation of the maximum economic recovery. The BLM determined that the proposed mine plan and mining system will offer the greatest possible economic recovery of the Sunnyside Seam in the LMU area given the anticipated mining conditions. As development and mining of the reserves proceeds, the mine plan and associated mining system will be continually reevaluated to ensure that an optimal approach is being taken for the relevant factors.

The coal contained in the LMU is high sulfur and currently difficult to market. Contracts for the coal are very limited at this time. It is possible that areas within the identified recoverable reserves may be extremely high in sulfur and cannot be marketed. Some high sulfur coal may be left in place due to economic reasons.

### Findings:

The permittee met the minimum requirements of this section.

## SUBSIDENCE CONTROL PLAN

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

### Analysis:

#### Renewable resources survey

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

#### Subsidence control plan

- Coal will be removed by room-and-pillar methods. If the demand for coal increases, then longwall methods may be used. Details of the mining plan are given in Section 522 and 523. Plate 5-5 shows the mine layout and the sequence and timing of mining.
- On Plate 5-5 the permittee shows the proposed underground workings and the areas of potential subsidence. **Plate 5-5 shows that mining and subsidence will occur outside the permit area.** The permittee needs to revise the mine plan so that all mining and subsidence activities will occur inside the permit area.

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**OPERATION PLAN**

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- R645-301-525.440 requires that the permittee describe the subsidence monitoring plan. The plan is inadequate because it does not give enough details. The proposed plan calls for monitoring points to be established before any 2<sup>nd</sup> mining. The location of the control points will be determined to within  $\pm 6''$  of the actual location. The survey will continue until subsidence measure is less than 10% from the previous years measurement.

**The Division needs to know the approximate location of the monitoring points before mining begins. The Division wants to avoid issuing a permit with stipulation because of the complications that occur. The permittee also needs to commit not to begin mining before the monitoring stations have been installed.**

**The permittee originally committed to conduct a ground survey but then eliminated it from the subsidence plan. The Division usually requires a permittee to conduct ground surveys to check for subsidence cracks and damage to surface water.**

**The Division requires subsidence monitoring to continue for 5 years after mining to insure that subsidence has ceased. Additional monitoring may be needed if the ground has not stabilized.**

- The permittee states that the escarpments will be protected from subsidence by allowing first mining only within 200 ft. of the outcrops. The permittee refers to the R2P2 for information about why 200 ft. barrier pillars will be used. The anticipated effects of planned subsidence may include tension cracks, fissures, sinkholes and lowering of the ground surface.

The permittee does not plan to take steps to prevent subsidence except escarpment protection. The permittee states in the amendment that if subsidence causes damage then he will restore the land to a condition capable of maintaining the value and reasonable foreseeable uses that the land was capable of supporting before subsidence.

- The permittee states that the anticipated effects of subsidence are:

Anticipated effects of planned subsidence may include tension cracks, fissures, or sinkholes. Areas of minimal ground lowering may be anticipated.

The Division has received comments from the public that subsidence might damage seeps and springs in the area. Landowners near the Lila Canyon project have concerns about water loss.

- The permittee describes the measures to be taken to mitigate or remedy any subsidence-related material damage to, or diminution in value or reasonably foreseeable use of the land, or structures or facilities to the extent required under State law as follows:

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

The permittee commits to mitigate any damage to water rights.

#### **Performance standards for subsidence control**

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

#### **Findings:**

Information provided in the proposed amendment is not considered adequate to meet the requirements of this section. Prior to approval, the permittee must provide the following in accordance with:

**R645-300-141**, The permittee must revise Plate 5-5 and the mine plan so that all mining activities and planned subsidence occur inside the permit area. Plate 5-5 shows that mining and subsidence will occur outside the southern permit boundary area.

**R645-301-333**, The applicant has committed to not subside escarpments that contain eagle nests, but it appears the area near one nest would be subsided. The applicant needs to contain a commitment that an alternate nest will be provided if this nest is lost through the effects of subsidence. If the nest is not lost, no additional mitigation would be needed.

**R645-301-525.440**, The permittee does not give details of the subsidence monitoring plan. The permittee needs to show the approximate location of the proposed monitoring points and commit to installing the monitoring points before mining begins.

**R645-301-525.440**, The Division finds the monitoring program inadequate because the survey time is too short. The Division usually requires the permittee to monitor 5 years after mining stops and subsidence stabilizes before allowing the permittee to stop subsidence monitoring.

**R645-301-525.440**, The subsidence monitoring program must include a ground survey. The ground survey is needed to find crack that could affect surface water. Note: the Division did require the permittee to remove a phrase from the amendment that involved a ground survey being needed to verify subsidence damage before mitigation could occur. The Division did not want the ground survey to be removed rather than mitigation would only occur after a ground survey was conducted.

#### **SLIDES AND OTHER DAMAGE**

**Analysis:**

The permittee committed to phone the Division if a slide occurred. The Division would then be informed of the remedial plan. If the Division believed the remedial plan to be inadequate, they would tell the permittee what additional steps were needed. The permittee committed to report any potential hazards of impoundments that are found during an inspection.

**Findings:**

The permittee met the minimum requirements of this section.

**FISH AND WILDLIFE PROTECTION**

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

**Analysis:****Protection and Enhancement Plan**

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

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

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

All suitable water encountered during mining will be discharged in a manner that it becomes available to wildlife. The applicant will need to ensure the water rights allow for this use and that the water quality is suitable. The water rights listed in Table 7-2 indicate the uses are for "mining" and "other." Ensuring that water quality is suitable should be possible through testing required for the discharge permit.

The application discusses the possible benefits of water in the sediment pond to wildlife. In the event water in the pond contains materials hazardous to wildlife, it would be removed and the pond monitored to ensure no negative effects on wildlife.

Wildlife Resources indicates there are bighorn sheep that spend all year in the Lila Canyon area, and use by sheep is expected to be curtailed following construction. Wildlife Resources also commented that Lila Canyon, and more particularly the water sources up the canyon, are heavily used by chukars, and they feel the mining operations will affect these birds. They suggested the applicant install some watering structures of a suitable design and said these water sources would greatly benefit chukars and other area wildlife. According to the application, the applicant has agreed to install two guzzlers.

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

As the mitigation projects are completed, some details should be included in the application or mining and reclamation plan. If this does not happen, it is easy to lose track of what was accomplished. If the applicant or anyone else visits the mitigation sites, general comments on use should be noted and reported to Wildlife Resources and the Division.

### **Endangered and Threatened Species and Bald and Golden Eagles**

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

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

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

Section 358.200 contains a commitment to safeguard any escarpment that has been identified as a raptor nest site; however, there is one nest within the subsidence area as shown on Plate 5-3. The Division assumes this nest could actually be lost, not just not used. In Section 322.220, the application indicates loss of the nest is not relevant since the applicant will have already mitigated for loss of the nest.

The applicant's August 23, 2000, response letter says, "First seam mining (Leaving the pillars) should adequately protect existing raptor nests from subsidence." According to Plate 5-3, the nest is very close to the gate road pillars, but since it is within the subsidence area shown on this map, the Division must assume the nest is within the subsidence angle of draw.

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**OPERATION PLAN**

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The mitigation to which the applicant has already committed is for loss of use of the nests in proximity to the mine for the period of the mine operations rather than for actual loss of the nests or nest sites. After discussing this situation with the Division of Wildlife Resources and the Fish and Wildlife Service, the Division has decided the application needs to contain a commitment to provide an alternate nest site if this nest is lost through subsidence. Loss of the nest would be determined in raptor nest monitoring. If the nest site remains undamaged after subsidence is complete, no additional mitigation would be necessary.

It is possible this nest could be used in spite of its proximity to the mine. For this reason, it will be necessary to monitor the site near the time when it would be undermined. It might be necessary to preclude birds from using the nest when subsidence is expected.

In Section 358.200, the applicant commits to conduct a raptor survey to ensure that raptors or their nests or young will not be adversely affected though any mining or mine-related activity. If any previously unknown nests are found, it may be necessary to develop protection or mitigation plans.

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

R645-301-358.510 requires that the operator ensure that power lines used for or incidental to coal mining and reclamation operations within the permit area be designed, constructed and maintained to minimize electrocution hazards to raptors. The application contains a commitment to this effect. The Fish and Wildlife Service recommends application of power line designs such as those in the Avian Power Line Interaction Committee's "Mitigating Bird Collisions with Power Lines: the State of the Art in 1994," or "Suggested Practices for Raptor Protection on Power Lines: the State of the Art in 1996," prepared for the Edison Electric Institute/Raptor Research Foundation, Washington, D. C.

### **Wetlands and Habitats of Unusually High Value for Fish and Wildlife**

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

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

While the access road and power lines will probably not be regulated by the Division, the Division of Wildlife Resources and Fish and Wildlife Service commented on these facilities. It is very important that power lines be designed and constructed in accordance with the most current technology to avoid electrocutions. The poles will be used by golden eagles, ferruginous hawks, and other raptors.

Many big game animals are killed in collisions with vehicles used to haul coal, and it is vital that drivers be instructed on the importance of maintaining proper speeds and watching for wildlife. Any animals killed must be taken well off the road to avoid scavengers, including eagles, being hit. They should also be reported to Wildlife Resources.

The Division finds that there is not likely to be any adverse effect to any threatened or endangered species with the exception of four fish species of the Upper Colorado River Basin: the Colorado pikeminnow, the humpback chub, the bonytail chub, and the razorback sucker. While water consumption by the proposed operation would consume about 21.3 acre-feet of water annually and thus jeopardize the continued existence of or adversely modify the critical habitat of these species, existing inter-agency section 7 agreements address these concerns. The Fish and Wildlife Service has concurred with these findings.

## TOPSOIL AND SUBSOIL

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

### Analysis:

Chapter 2, Soils, Sections 230 through 234, discusses the soils operation plan for the proposed Lila Canyon Mine. Topsoil protection uses traditional methods of salvaging and stockpiling. The plan contains some measures for subsoil salvage and protection. The Analysis section discusses operation information as follows:

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

### Topsoil and Subsoil Removal

#### *Available Soil Resources*

The 1998 Order 1 soil survey, Appendix 2-3, identifies 157,600 cubic yards of available soil for salvage from the 48 acre disturbance, for an average salvage depth of 24 inches. As summarized, soil salvage estimates are broken down according to soil survey map units and are based on the entire disturbance area. Plate 2-3, Soil Salvage and Replacement, shows an undisturbed island and two connected “*in-situ* topsoil storage areas” within the disturbed area boundary that effectively reduce the disturbance acreage. Section 232.100, Table (Available Soil Resources), identifies a **potential soil salvage** volume of 148,630 cubic yards from a 40.77 acre disturbance area for an average salvage depth of 25.4 inches. Table 2 of this technical analysis (see below) summarizes the potential soil salvage volumes as presented in the Available Soil Resources table in Section 232.100 of the application.

Potential salvage depths were generated for each soil map unit based on evaluations of all field and laboratory data, plant rooting depth and subsurface rock content. Soil salvage areas are broken down by soil survey map units and are identified on the Salvageable Soils Map, Appendix A2 of Appendix 2-3, Order 1 Soil Survey. The Salvageable Soils Map shows each soil survey map unit, soil description sites, and potential salvage depths. Typically, the dark colored A horizon is often referred to as topsoil. However, if the A horizon is less than six inches deep, Table 2.Potential soil salvage volumes.

Potential Soil Salvage Volumes			
Soil Map Unit	Potential Salvage (inches)	Acres	Volume (yd <sup>3</sup> )
SBG	48	11.69	75,439
VBJ	30	9.95	40,132
XBS	12	8.89	14,342
DSH	40	1.85	9,949
RBL	8	7.44	8,002
RBT	6	0.949	766
Total		40.77	148,630

**Table 3.** Amounts of Rocks and Roots in the Potential Soil Salvage Layers

Map Unit	Salvageable Soil Layer (inches)	Many to Common Fine Roots Rooting Depth (inches)	Subsurface Rock Within Soil Salvage Layer (percent)
SBG	48	48	10 to 65
VBJ	30	18	5 to 65
XBS	12	12	25 to 40
DSH	40	26	<5 to 45
RBL	8	not listed	30
RBT	6	6	35

topsoil generally consists of the A and upper B horizon soils that have suitable characteristics for plant growth and show natural fine to very fine roots. Soil salvage depths of suitable soil material are listed in Table 3 as compared to rooting depth and subsurface rock content.

#### *Topsoil Salvage Practices*

State regulations R645-301-232.100 are specific in requiring that all topsoil be removed from the area to be disturbed. Since the A horizon is less than six inches deep, the amendment defines "Topsoil" as the suitable soil for plant growth, generally, the upper 6 to 12 inches that consist of both the A and B horizon materials. Therefore, the amendment states that **actual topsoil salvage** will consist of removing the surface layer (true topsoil) averaging about 8 inches thick over the disturbed area and additional portions of subsoil about 10 inches thick and treating the mixture as topsoil. Large stones, 36" or less, are considered part of the soil layer and are included in the topsoil volume estimates. The Available Soil Resources table (see Table 4 below) in Section 232.100 shows **actual topsoil salvage** as 49,011 cubic yards from 23.43 acres for an average salvage depth of 15.6 inches. Plate 2-3, Soil Salvage and Replacement, shows each of the proposed disturbed soil map units and salvage depth in each unit based on reduced acreage from the

undisturbed island and *in-situ* topsoil storage areas within the disturbance area, and on a maximum salvage depth of 18 inches, or down to shale, whichever is less.

The application says the total volume of soil stored in the topsoil pile would be approximately 49,000 cubic yards. Soil recovered from the fan site may be stored near the fan. The applicant needs to indicate where soil from the fan site will be stored. If stored at the fan site, the location of the storage pile needs to be shown on a map together with cross sections of the planed storage pile. If soil from the fan area is not stored in the main topsoil area, the applicant needs to adjust the volume estimation for the main topsoil pile.

**Table 4.** Actual Soil Salvage Volumes

Actual Soil Salvage Areas	Soil Depth (inches)	Acres	Soil Volume (yd <sup>3</sup> )
Topsoil* SBG	18	11.10	26,873
Topsoil* VBJ	18	3.87	9,364
Topsoil* XBS	12	3.87	6,250
Topsoil* DSH	18	1.36	3,291
Topsoil* RBL	8	2.35	2,524
Topsoil* RBT	6	0.88	709
Total		23.43	49,011

\* A horizons < 6 inches; topsoil defined as top 18 inches.

Topsoil salvage at the proposed exhaust fan site located near the coal outcrop will be stored on-site, in the immediate disturbance area for fan installation. The proposed fan site is at an elevation of about 6400 feet and is located on a narrow bench, with a slope of about 40 to 45%. The soil survey identifies an approximate salvage depth of 6 inches for the RBT soils. The applicant needs to show the location of the fan site topsoil storage area on appropriate maps in the application.

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

Topsoil removal sequence will start from the lower elevations of the site and proceed up slope. Surface disturbance may not be required on all of the acreage identified as "Disturbed Area." Plate 2-3, Soil Salvage and Replacement, shows an undisturbed island surrounded by disturbed area and two (connected) *in-situ* topsoil storage areas within the disturbed area boundary. No soil will be salvaged from these areas.

The application needs to discuss the difference between "*in-situ* topsoil storage" and "undisturbed." Why is it necessary to designate the *in-situ* storage areas rather than calling them undisturbed? Other than

drainage control structures, a possible refuse pile, the topsoil pile, the coal storage area, the south rock slope portal, and the conveyor from the mine, all discussed below, it does not appear there would be any disturbance in the *in-situ* topsoil storage areas or the undisturbed area.

- **Refuse Pile.** Figure 1, Appendix 5-7 shows a refuse area in the *in-situ* topsoil storage area. The application does not indicate soil would be salvaged from this area.
- **Topsoil Pile Access.** None of the maps showing the topsoil storage area (topsoil pile) shows how the applicant will gain access to this pile. If the applicant intends to build a road to the pile, soil on this road needs to first be salvaged.
- **Drainage Controls.** Plate 7-2 shows drainage control structures on the south side of the *in-situ* topsoil storage area, but the application presents no plans to salvage soil from this area.
- **Coal Storage Pile.** The radius of the coal storage pile is shown on Plate 5-2 as being 114 feet, but the storage area is not drawn to scale on this plate. On the north side, the coal storage area overlaps with the undisturbed area because of this problem with the scale. The area involved is not large, but this needs to be corrected, either by shrinking the size of the coal storage area or by increasing the size of the disturbed area and increasing the amount of topsoil to be salvaged.
- **South Rock Slope Portal.** The south rock slope portal entrance is in the *in-situ* topsoil storage area. Soil over the portal area itself and any adjacent areas that would be disturbed needs to be salvaged.
- **Conveyor.** The entire area under the conveyor needs to be designated as disturbed area with topsoil salvage. If soil was left under the conveyor, it would probably be contaminated with coal fines and with coal from accidental spills.

The applicant should also plan to salvage soil from any areas where construction equipment needs to cross the undisturbed area or the *in-situ* topsoil storage area.

The Division is concerned about protecting soils in the undisturbed and *in-situ* topsoil storage areas from accidental and water- and wind-born contaminants. Much of the *in-situ* topsoil storage area is downhill from the proposed disturbed area, and part of it is immediately adjacent to the coal storage area. There is a buffer between the south side of the coal storage area and the *in-situ* topsoil storage area, but it is not as large as shown on Plate 5-2 because of the problem with the scale discussed above.

The applicant needs to show methods of protecting these areas where soil has not been salvaged. The Division suggests there be a physical barrier, such as a jersey barrier or a large berm, between the coal pile and the undisturbed area and the *in-situ* topsoil storage area. The ditch proposed for the south side of the coal storage area is not adequate for this purpose.

The applicant indicated in its response letter to the June 29, 2000, technical analysis that the dust control measures currently shown in the plan should be adequate for controlling wind-born coal fines. In addition to these measures, the applicant should commit to checking the undisturbed and *in-situ* topsoil

storage areas periodically, about four times each year, to determine if there is any contamination. The application needs to contain a commitment to vacuum or otherwise clean up these fines and to develop further plans to minimize contamination if any problems are noted. Additional measures could include establishment of a larger disturbed area or building tall structures similar to snow fences.

If the *in-situ* topsoil storage area is truly a topsoil storage area as it appears to be since it is in the disturbed area boundary, the applicant will need to place signs on it just like a topsoil pile.

#### *Subsoil Segregation and Salvage Practices*

Section 232.100 of the application states that after topsoil removal, underlying subsoil will be used as fill or left in place. Below the upper 6 to 12 inches of topsoil, there is generally an increase in carbonates and rock. The application says that although these lower subsoils support plant roots, they are not considered as substitute topsoil in this case. Below the possible salvageable depths as listed for each soil, there is generally an additional large increase in rock content, upwards of 70 and 80%. Within the RBL and RBT soil areas, Mancos Shale is encountered immediately below the shallow soils. In no case should Mancos Shale be salvaged with the overlying soils.

Regulation R645-301-232.500 says the Division may require that the B horizon, C horizon, or other underlying soils be removed and segregated, stockpiled, and redistributed as subsoil if it finds that such subsoil layers are necessary to comply with the re-vegetation requirements of R645-301-353 through R645-301-357. While it is difficult to determine exactly how much soil is needed to attain adequate vegetation, it is vital that there be soil for plants to have enough rooting depth. Studies of plant phenology have clearly shown plants in arid areas use soil water from increasing depths as the growing season continues, and if there is inadequate rooting depth, production and vegetative cover will decrease. A good indication of the amount of soil needed is the rooting depth of the plants currently growing on the site.

As established in the Order 1 soil survey, projected subsoil salvage is based on subsoil replacement rooting depth and soil suitability criteria. The amendment states that deeper subsoils (> 18 inches) from Soil Map Units SBG, DSH, and VBJ will not be salvaged and will remain for use as construction fill during grading activities. Although these subsoils will be used as fill, they are needed during reclamation to reestablish rooting depth potential. Therefore, subsoil resource protection is required for maintaining "rooting-depth" characteristics. The application states that 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 or mixed with un-salvaged subsoils. The application says that contamination of the subsoil with shale will not be permitted. Furthermore, a certified soil specialist will be on site during construction and reclamation phases to observe and prevent the mixing of shales and subsoils. A commitment is given that additional soil removal in excess of the 18" minimum may be necessary to prevent the shale from contaminating the subsoil.

The applicant intends to use subsoils from Map Units SBG, DSH, and VBJ as construction fill. In these areas, the applicant will be salvaging and storing the top 18" of soil, so the Division is willing to allow the subsoils to be used as fills. However, it is important that these subsoils not be mixed with unacceptable subsoils and that the locations of the subsoils that will be used in reclamation be documented in the application. Otherwise, when the mine is reclaimed, it is likely there will be no record of where these subsoils were placed

The letter responding to the Division's June 29, 2000, technical analysis mentions cut and fill volumes for the various soil types. This information, however, is not in the application. Plate 2-4 shows the locations of cuts and fills in the disturbed area, and Plates 5-7A through 5-7C are cross sections of the existing, operational, and reclamation topography.

Plate 2-4 has a symbol, horizontal lines, not identified in the legend. Fill areas are designated on this plate by diagonal lines. It is not clear whether the cut and fill areas shown on Plate 2-4 are strictly the areas where *subsoil* would be cut and filled or if there would be other material. The response letter says the fill areas are where subsoil would be placed, but this is not stated in the text or on the plate. If the cut areas are strictly those areas from which subsoil will be removed, the application still needs to indicate how much material will be taken from these areas and how much will need to be returned.

Plates 5-7A through 5-7C do not show the limits, including both areal extent and depth, of subsoil storage areas compared to fill from other locations. It is important to identify the areas where the subsoil is being stored and the depths of subsoil in specific locations in the mine yard. This is the only way it will be possible to recover this material for reclamation. The Division suggests that detailed cross sectional maps would be appropriate to show the subsoil cut and storage areas. The subsoil volumes in the response letter should be included in the application.

The Division is concerned about potential contamination of the subsoils being used as pad material. A limited amount of contamination can be tolerated since these are subsoils and will be buried under 18 inches of topsoil; however, the Division is aware of at least one situation where substitute soils were rendered unusable for revegetation through contamination from road salt. The application needs to discuss methods that will be used to prevent this sort of problem.

#### *Adverse Conditions*

Sections 232.700 says it is anticipated that topsoil can be salvaged on areas to be disturbed, but Section 232.710 says soil removal from some local sites may be difficult due to rockiness and steep slopes. The application says disturbance will be minimal between the rock slopes and the run of mine coal stockpile. The topsoil will either be salvaged or jersey barriers will be installed to protect the unclaimed topsoil. The application also says one or two "vents" will be constructed in this area.

The applicant needs to clarify how jersey barriers would protect the topsoil between the rock slope portals and the coal stockpile. It appears "vents" may be a typographical error and that one or two "bents" will be erected in the area.

Bents, if built without disturbing any adjacent areas, might fall into the category of small areas where topsoil does not need to be salvaged, but areas where equipment operates or crosses needs to be considered disturbed. Additionally, as discussed above, facility construction would not be the only disturbance from the conveyor. Coal fines and coal spills would also adversely affect the soil and vegetation, so the entire area beneath the conveyor should be designated as disturbed.

The Division considers that if slopes are accessible to construction equipment for the purpose of building mine facilities, these same slopes are also accessible to equipment that would be used to salvage soil.

## Topsoil Substitutes and Supplements

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

### *Refuse Pile*

Under the definitions in R645-100, the material generated in excavating the rock slopes is considered underground development waste which is coal mine waste that must be disposed of in a refuse pile. In addition to the underground development waste, the applicant also intends to dispose of coal processing waste and other underground development waste in addition to the rock slope material. The refuse pile needs to be covered with at least four feet of the best available, nontoxic and noncombustible material.

According to the application, topsoil will be salvaged to a depth of 18 inches and stored in the stockpile. The subsoil will be excavated an additional 30 inches and pushed to the side. Refuse material will be placed in the excavated hole created from the subsoil removal. Once the hole is filled, the subsoil will be placed over the top of the refuse. Another hole will be excavated by removing subsoil adjacent to the previous hole. The topsoil removal and storage, subsoil removal, refuse placement, and subsoil replacement procedures will be repeated as additional refuse disposal is needed.

This process is shown in Figure 1, Appendix 5-7, and is detailed in Figure 2, Appendix 5-7. It does not appear the cross sections in these figures are keyed to the other maps in the application. The cross section locations shown on Figure 1 and on other maps in the application extend far beyond the "Slope Rock & Refuse Storage Area," but the cross sections shown in detail in Figure 2 cover essentially only this area. A map in the application needs to show the locations and extents of these cross sections.

Part of the refuse pile would be in the DSH soil mapping unit, and the Available Soil Resources table in Section 232.100 indicates the potential salvage depth in this unit is 40 inches. According to the plan for the refuse pile, 18 inches of soil would be salvaged from the entire refuse pile area, and an additional 30 inches of subsoil would be moved to the side to facilitate burial of the refuse. This goes eight inches below the potential salvage depth for this mapping unit; however, it does not appear there are serious restrictions to the soil between 40 and 48 inches. *It is important that soil below 48 inches not be used in either the DSH or the SBG area.* Soils below 48 inches have even higher rock contents and also start to have higher salt levels.

Figure 1, Appendix 5-7, shows a refuse area that would be in the *in-situ* topsoil storage area. The application does not contain further details of this refuse area, and it may be a relict of past applications. If the applicant intends to construct a refuse pile in this area, the application needs to provide for complete plans and topsoil salvage, storage and reclamation of the pile.

Plates 5-2 and 7-5 show rock storage areas north of the slope, rock and refuse storage area. As discussed above and in Section 232.100 of the application, boulders will not be stockpiled; therefore, the Division concludes these rock disposal areas must be additional coal refuse disposal areas. The application, however, does not include plans for constructing and reclaiming such areas. This needs to be clarified and corrected.

## Topsoil Storage

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

Section 232.100 of the application discusses the dimensions and storage capacity of the main topsoil storage pile, and Plate 5-2 shows the pile location and cross sections. The application does not give drawings, including cross sections and location, of the storage pile at the fan portal.

### Findings:

Information provided in the application is not adequate to meet the requirements of this section of the regulations. The applicant must provide the following in accordance with:

**R645-301-232**, The applicant needs to salvage soil from all areas that would be disturbed by coal mining and reclamation activities except the topsoil piles. According to various maps in the application, undisturbed and *in-situ* topsoil storage areas would have disturbance from drainage control structures, one of the rock slope portals, the run of mine conveyor, a refuse pile, and the coal storage pile. The topsoil salvage and storage plan needs to account for these disturbances. Also, the plan shows no access to the topsoil pile. The application needs to explain the difference between "*in-situ* topsoil storage" and "undisturbed" areas.

**R645-300-141, R645-301-232.220**, The applicant needs to show methods of protecting soils in undisturbed areas adjacent to the coal mining and reclamation operations, especially the soils near the coal storage pile. The applicant should commit to checking these areas periodically to determine if there is any contamination and to cleaning up any fines that may accumulate.

**R645-301-234, R645-301-521.165**, The application needs to include enough detail of subsoil storage locations that it will be possible at the time of reclamation to know what cut and fill material will be replaced in which locations.

**R645-301-232.500**, The applicant needs to show how subsoils being stored as pad material will be protected from contaminants that would make them unusable.

**R645-301-232**, The applicant needs to clarify how jersey barriers would protect the topsoil between the rock slope portals and the coal stockpile. Facility construction itself would not be the only anticipated disturbance in this area; soils beneath the conveyor would probably be contaminated with coal fines and coal from spills. It appears "vents" may be a typographical error and that one or two "bents" will be erected in the area.

**R645-301-536**, The cross sections in Figure 2, Appendix 5-7, need to be keyed to another map in the application.

**R645-301-553.250**, Figure 1, Appendix 5-7, shows a refuse area that would be in the *in-situ* topsoil storage area, but the application does not contain further details about this refuse area. If the applicant intends to construct a refuse pile in this area, it needs to provide for complete plans and topsoil salvage, storage, and reclamation of the pile.

**R645-301-121.200**, To the north of the slope, rock and refuse disposal area, Plates 5-2 and 7-5 show rock storage areas. The applicant needs to clarify what these areas are and show them on all appropriate maps. Depending on what these are, it might be necessary to provide more specific reclamation plans for these areas.

**R645-301-234.100, R645-301-521.160 and R645-301-521.165**, The applicant needs to show where soil from the fan site will be stored. If it is to be stored near the fan apart from the main storage area, the applicant needs to provide engineered drawings of the projected topsoil stockpile in the fan portal area, showing size, placement, and cross sections. Also, the calculations of the amount of soil in the main storage area would need to be modified.

## VEGETATION

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

### Analysis:

All incidental disturbances that will not be used as part of the operations will be revegetated with an interim seed mix. Table 3.4/3.5 is a seed mix that would be used for both interim and final revegetation. While this seed mix should provide adequate erosion protection for both interim and final reclamation, the Division recommends the applicant include one or more rhizomatous grass species to enhance vegetation cover and erosion control further.

Section 331 refers to the revegetation plan in Section 340 for further information about revegetation methods. The details of this plan are discussed under "Revegetation" below.

### Findings:

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

While the species in the seed mix should be adequate for interim revegetation, the Division recommends adding at least one species of rhizomatous grass, such as western wheatgrass or thickspike wheatgrass.

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## ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

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

### Analysis:

#### Road classification system

The permittee states in Section 527.200 that all roads for the Lila Canyon project are shown on Plate 5-2. All of the mine roads shown on Plate 5-2 are classified as primary roads. No ancillary roads are associated with the Lila Canyon project. The information about road classification systems meets the minimum requirements of this subsection.

#### Plans and drawings

- In Section 527.200 of the amendment the permittee states that detailed designs and descriptions for each road within the permit area are included in Appendix 5-4 and all roads are shown on Plate 5-2. Appendix 5-4 does not contain information about the road embankment safety factor. The road embankment stability analysis is in Appendix 5-5.
- Appendix 5-5 has information about slope stability for the roads. The permittee states that a slope stability analysis was done for the road embankment and road cut slope.
- The permittee used the Hoek method for calculating slope stability factors. The stability analysis shows that the road embankment and cut slope are stable.
- Appendix 5-4 has a drawing labeled "Typical road section." The drawing is an enlargement of part of the area identified as 12+00 to 20+00 on Plate 5-2.
- The permittee does not propose to locate a road in the channel of an intermittent or perennial stream.
- The permittee does not propose to locate a temporary ford in the channel of an intermittent or perennial stream.
- The permittee does not propose to alter or relocate a natural stream channel.
- The permittee does not propose a low-water crossing of a perennial or intermittent stream channel.
- The permittee states in Section 542.600 that there will be no roads left after final reclamation within the mine facilities permitted area. All roads will be reclaimed upon cessation of mining.

### **Performance standards**

The permittee will be responsible for insuring that the roads meet the performance standards.

### **Primary road certification**

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

### **Other Transportation Facilities**

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

### **Findings:**

The permittee met the minimum requirements of this section.

## **SPOIL AND WASTE MATERIALS**

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

### **Analysis:**

The permittee showed the location where noncoal waste would be stored on Plate 5-2. In Section 528.332 the permittee states that final disposal of noncoal mine wastes except for concrete will be disposed in an area designed and constructed to ensure that leachate and drainage does not degrade surface or underground water. The permittee also states that all noncoal mine waste except for concrete will be shipped to ECDC for final disposal.

The reference to disposing of noncoal waste in an area designed and constructed to ensure that leachate and drainage does not degrade surface or underground water is confusing. **If the permittee proposes to dispose of noncoal waste on site then they must have designs for the storage facility. If the permittee intends to ship the material off site to a state approved facility then no designs are needed.**

The Division usually allows an operator to dispose of concrete on site. The on site disposal of concrete is usually done by placing the concrete in areas that will be backfilled and graded. The Division usually requires that at least 4 feet of material is place over the concrete to allow for proper vegetation growth. **The permittee must show where the concrete will be disposed and how the area will be reclaimed.**

### **Coal mine waste**

The permittee states in Section 528.320 that coal mine waste will be placed in new disposal areas within the permit area. The permittee refers to the coal mine waste disposal areas as the rock/coal waste storage areas, rock slope/coal waste storage areas, the pad and refuse pile. The permittee needs to be consistent in the name for the coal mine waste disposal area.

The permittee shows storage areas called rock storage areas. The Division is not sure what materials will be placed in the rock storage areas. If the material is from coal mining or coal processing activities then the material is refuse. All refuse must be placed in approved refuse piles. The rock storage areas are not approved refuse piles.

Coal mine waste will be placed in a control manner to:

- Minimize adverse effects of leachate and surface-water runoff on surface and groundwater quality and quantity. The effects of leachate and surface-water runoff should be controlled by covering the refuse with a minimum of 4' of subsoil and topsoil. Reclamation projects
- Ensure mass stability and prevent mass movement during and after construction. The PAP does not contain detailed plans for the refuse pile.
- Ensure that the final disposal facility is suitable for reclamation and revegetation compatible with the natural surroundings and the approved postmining land use. The plan calls for placing 30" of subsoil and 18" of top soil on the pile. That cover amount is usually considered adequate to meet vegetation requirements.
- Not create a public hazard. The Division will inspect the disposal site during construction, operation and reclamation. If the facility becomes a public hazard, the Division will take action.
- Combustion at the refuse pile should be minimized by proper compaction and cover.

The permittee does not propose to place coal mine waste material from other facilities in the coal mine waste disposal facility. If needed, the permittee can request that the permit be amended.

The Division will have an inspector monitoring the construction of the coal mine waste disposal facility. If any problems are encountered, the inspector will take action.

### **Refuse piles**

The plan for the refuse pile is in Appendix 5-7. No springs, water courses or wet weather seeps exist in the refuse piles area. The permittee committed to remove all vegetation and topsoil during construction. The permittee does not propose to use terraces for constructing the refuse pile. The pile will be reclaimed by placing 4 feet of material over the refuse. The permittee committed to having the refuse pile inspected as stated in the R645 rules.

### **Impounding structures**

The permittee does not propose to construct any impoundments from coal mine waste.

### **Burning and burned waste utilization**

The plan to extinguish coal mines fire is adequate and found in Appendix 5-3.

### **Return of coal processing waste to abandoned underground workings**

The permittee does not propose to dispose of coal mine waste underground.

### **Excess spoil**

The permittee does not anticipate that any excess spoil will be generated.

### **Findings:**

**R645-301-528.332,** The permittee needs to show the location of the on site concrete disposal areas and describe how the concrete will be placed and covered. If the permittee intends to dispose of noncoal mine waste in an area that is not a state approved facility then they must submit designs to show that no leachate will enter the groundwater or surface water. The general comment in Section 528.332 is inadequate to show that leachate will not degrade surface or underground water. **If the permittee intends to disposal of all noncoal waste except concrete at ECDC then they must modify the text.**

**R645-301-121.200,** The permittee must be clear, concise and consistent with the name used to refer to the disposal area for coal mine waste. The permittee refers to the area by several names such as the rock/coal waste storage areas, rock slope/coal waste storage areas, the pad and refuse pile. The permittee should avoid using terms to describe the coal mine waste that are not defined in the R645 rules. Those materials should be called coal mine waste, coal processing waste or underground development waste.

**R645-301-121.200,** The permittee must be consistent when showing the areas labeled rock storage areas on all maps and plates.

**R645-301-536.100,** The designs for the refuse pile must include the detailed cross sections and maps.

**R645-301-536.110,** The designs for the refuse pile must include detailed slope stability analysis. The permittee must use a method that accounts for multiple soils with different physical properties.

## HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

### Analysis:

#### Ground-water monitoring

Ground-water monitoring will be conducted according to the ground-water monitoring plan in Section 731.210 of the MRP.

Operational ground-water monitoring sites are listed in Table 7-3 and locations are shown on Plate 7-4. Six seeps and spring ground-water monitoring sites, L-6-G through L-11-G, are proposed: they will be monitored quarterly for parameters listed in Table 7-5. This table lists the same parameters as Table 4 of UDOGM directive Tech 004, plus oil and grease, which is not normally necessary for ground water monitoring. Water levels will be measured quarterly in wells IPA 1, 2, and 3. Station L-5-G is the potential mine discharge point and will be monitored monthly or as frequently as discharges occur, in accordance with UPDES Permit requirements.

Ground-water monitoring data are to be submitted every three months to the Division. Sections 731.212 of the Lila Canyon Significant Revision contains a commitment from the permittee that when the analysis of any ground-water sample indicates noncompliance with the permit conditions, the operator will promptly notify the Division and immediately take the actions provided for in 145 and 731 (Sections R645-301-145 and -731 of the Coal Mining Rules).

Ground-water monitoring will continue through mining and reclamation until bond release (Section 731.214). If ground water is encountered in future mining in a quantity that requires discharge, it will be monitored in accordance with requirements of Section 731.210, and a monitoring plan will be proposed at that time. Operational ground- and surface-water monitoring will be implemented upon approval of the plan.

The permittee commits in Section 731.215 that equipment, structures and other devices used in conjunction with monitoring the quality of ground water on-site and off-site will be properly installed, maintained and operated and will be removed by the operator when no longer needed.

#### Surface-water monitoring

Locations of all monitoring sites are shown on Plate 7-4, "Water Monitoring Location Map". Proposed monitoring methods, parameters and frequencies are described in Table 7-3, "Water Monitoring Stations", and Table 7-4, "Water Monitoring Parameters". Monitoring reports will be submitted to the Division at least every 3 months, within 30 days following the end of each quarter. The operational water monitoring plan will be implemented upon approval of the MRP.

The proposed surface-water monitoring plan is detailed in Section 731.220.

This plan is based on PHC determination and analysis of all baseline hydrologic, geologic and other information in this permit application. The plan provides for monitoring of parameters that relate to the suitability of the surface water for current and approved postmining land uses and to the objectives for protection of the hydrologic balance as set forth in 751 (see Table 7-4).

DOGM had discussions with Kerry Flood, to the Bureau of Land Management, he originally proposed that the operator (UtahAmerican Energy, Inc.) develop a water monitoring plan for Range Creek, a perennial stream several miles north-west of the mine, to assess any potential impacts from mining to the perennial stream. No monitoring plan has been proposed by the operator. It was determined later by the BLM that Range Creek was substantially distal, that influence from mining activities were unlikely. It was suggested to the permittee that monitoring Range Creek could protect the mine's interest in the event that other activities such as logging and grazing could impact the creek, which could be interpreted by the landowners to be effects caused by mining.

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.

#### **Acid and toxic-forming materials**

Drainage from acid- and toxic-forming materials and underground development waste into surface water and ground water will be avoided by implementation of a Spill Prevention Control and Countermeasure (SPCC) Plan and by the following:

Potentially acid- or toxic-forming materials will be identified by use of Material Safety Data Sheets (MSDS), or by direct sampling and analysis in the case of underground development waste.

Any material which exhibits acid- or toxic-forming characteristics will be properly stored, protected from runoff, removed to an approved disposal site or buried on site beneath a minimum of 4' of non-acid, non-toxic material.

Storage of potentially acid- or toxic-forming materials, such as fuel, oils, solvents and non-coal waste will be in a controlled manner, designed to contain spillage and prevent runoff to surface or ground water resources.

All oils and solvents will be stored in proper containers within enclosed structures. Fuels will be stored in appropriate tanks, enclosed within concrete or earthen bermed areas designed to contain any spillage.

Non-coal waste (garbage) will be stored in a designated location, in dumpsters, and removed to an approved landfill (East Carbon Development Contractors - ECDC) on a regular, as-needed basis.

Unused or obsolete equipment or supplies will be stored in a designated area. Drainage from the storage area will be directed to the sediment pond as shown on the Sediment Control Map, Plate 7-5.

Underground development waste (if any) will also be stored in a designated area. Such waste will be tested for acid- or toxic-forming potential, and if found to be acid- or toxic-forming, the waste site will be protected from surface runoff by the use of earthen berms.

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**OPERATION PLAN**

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**Transfer of wells**

There are presently three monitoring wells on this permit. When these wells are no longer required, they will be sealed in a safe, environmentally sound manner in accordance with regulations .

**Discharges into an underground mine**

There are no plans to discharge any water into an underground mine.

**Gravity discharges**

Based on historical data from other mines in the area, some mine water can be expected to be encountered during the mining operation. Typically, such water is stored in "sumps" or designated areas in the mine and used for mining operations or discharged to the surface.

At the present time, there are no plans to divert water from the underground workings of this operation to any other underground workings. In the event this happens the permittee has stated that receiving channels will be studied before and during discharge to analyze any adverse impacts.

**Water quality standards and effluent limitations**

Any discharge from the sediment pond will be made in compliance with all Utah and federal water quality laws and regulations and with effluent limitations for coal mining promulgated by the U.S. Environmental Protection Agency set forth in 40 CFR Part 434.

**Diversions**

There are is one major undisturbed diversion planned for this minesite. This diversion consists of a bypass culvert beneath the sediment pond and the old road grade, which will allow undisturbed runoff to bypass the site without mixing with disturbed area runoff. The permittee has proposed to install a 60 inch culvert, UC-2 (Plate 7-2) which will extend under the sedimentation pond and road grade embankment. The existing 36 inch culvert will be excavated and removed.

The applicant based the riprap sizing on calculations from 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 calculations the apron has a 0 degree slope, designed to be 20 feet long and widening from 5 feet to 9 feet . Riprap is conservative with a D-50 of 12 inches. It will be placed to a depth of 1.5 D50 and will be embedded in a 6 inch layer of drain rock filter. Riprap will also be placed on a 2:1 side slope to the height of the culvert at the culvert outlet tapering to 2 feet at the outlet of the apron.

In a telephone conversation with Jim Wells, Utah Division of Water Rights on November 17, 2000, I asked what criteria was involved for a Stream Alteration Permit. The main requirement is that stream channel contain riparian vegetation and a relatively frequency of flow. The channel where the culverts UC-1 and UC-2 does not meet those requirements. The channel is ephemeral and vegetation ranges between xeric to mesic, consisting of single leaf ash and rabbit brush.

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.

It is unclear from Plates 7-2 and 7-5 how undisturbed drainage above the disturbed areas DA-1 and DA-2 will be diverted or controlled. There are no indications of undisturbed drainage ditches to route disturbed area drainage away from the disturbed area.

The applicant indicates that 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.

Plate 7-5 and 7-6 identify the undisturbed culverts, UC-1 and UC-2, in the south fork of Coleman Wash (which runs along the south side of the proposed mine pad). Culvert details are provided in Appendix 7-4. The applicant has proposed to install UC-2 as a 60 inch culvert and UC-1 as a 30 inch culvert.

Calculations indicate that the 100 year-6 hour precipitation event flows about 51.6 cubic feet per second (cfs). A culvert with a headwall of one depth in diameter H/D(60 inches). A culvert of 42 inch diameter could have been used, however, late summer thunderstorms wash sediment and debris down the channels, and the larger 60 inch culvert was picked by Utah Division of Water Rights, (Stream Alteration Permit Program) to ensure extra safety, since the sedimentation pond is built above the culvert. The 10 year-6 hour precipitation was calculated to be 38.2 cfs. It is for the above reason that culvert UC-1 should also be designed using a larger culvert.

All undisturbed culvert inlets will be provided with headwall protection, consisting of inlet sections, rock or concrete. The permittee has submitted Figure 4 which show a typical view of the trashrack and headwall structure for the undisturbed culvert UC-2.

### **Stream buffer zones**

No development or disturbance will take place within 100 feet of a perennial stream. The only perennial stream identified by the permittee is Range Creek approximately 6 miles north-east of the mine portal.

### **Sediment control measures**

Sediment control measures within and adjacent to the disturbed areas are detailed in Appendix 7-4. These measures include, but are not limited to:

As discussed in Appendix 7-4, runoff from the disturbed area will be captured in a sediment pond and/or treated as necessary to meet effluent limitations prior to discharge.

The primary means of velocity reduction in channels and at discharge points is the use of rip-rap; however, other methods such as straw dikes, check dams and/or vegetative filters may be employed during the operational or reclamation phases as determined necessary, and with Division approval.

### **Siltation structures**

As described in Appendix 7-4, the only siltation structures planned for this operation are a sediment pond and possible minor, temporary sediment traps such as straw dikes and/or catch basins.

Siltation structures will be designed, constructed and maintained in accordance with regulations.

## **Sedimentation ponds**

The general drainage plan the disturbed area is to divert surface flows using a system of ditches and culverts which direct flows to a single sedimentation pond for treatment. The sedimentation pond prior to discharge into the channel filled culvert, which carries it to the main channel off the permit area. Site drainage and design details are described in Appendix 7-4 and illustrated on Plates 7-6.

The sediment control plan and proposed sediment pond designs have been prepared and certified by Dan Guy, a Registered Professional Engineer, State of Utah.

Sediment pond locations, design plans and cross sections are provided on Plates 7-2, 7-5 and 7-6, respectively.

The pond is designed to contain the runoff from a 10 year - 24 hour precipitation event for the area in addition to a minimum of 2 years of sediment storage. See "Sediment Pond Construction Requirements" in Appendix 7-4 and Plate 7-6. The required volume of the sediment pond is calculated at 8.4 acres-feet, which includes 3 years of sediment storage. The existing sediment pond size will be a volume of approximately 8.5 acres-feet. Any discharge from the pond will be in accordance with the approved UPDES permit.

The proposed pond is not located where failure would expect to cause loss of life or serious property damage. As shown in Appendix 7-4, the proposed pond embankment will have a minimum of 3H : 1V on the inside slope and 2H : 1V on the outside. These slopes, along with the 95% compaction requirement, will ensure a static safety factor in excess of 1.3, as required.

All discharges from sedimentation ponds, diversions and culverts will be controlled to prevent channel erosion by the use of a riprap aprons where discharge velocities exceed 5 feet per second. Figure 4A shows a typical apron protection structure for UC-2. With the changes involving the emergency spillway the riprap size should be calculated to provide sufficient protection for the additional flow.

## **Other treatment facilities**

Appropriate sediment control measures will be designed, constructed and maintained using the best technology currently available to prevent, to the extent possible, additional contributions of sediment to stream flow or to runoff outside the permit area and meet the effluent limitations under R645-301-751.

## **Exemptions for siltation structures**

No exemptions requested by the permittee.

## **Discharge structures**

In the last submittal the operator changed the design of the emergency spillway from a riprap channel over the embankment to a stand (drop) pipe.

The principle spillway is a corrugated metal pipe culvert which opens to the undisturbed channel culvert. The emergency spillway will be constructed of a corrugated metal stand pipe installed next to the

principle spillway. Plate 7-6 shows a detailed view of the spillways, however the receiving culvert is designated UC-2.

The emergency spillway discharges into the 60 inch undisturbed culvert, UC-2, and will be used in combination with the principle spillway to pass the flow of a 25 year-6 hour precipitation event, (See Appendix 7-4). The changes proposed for the corrugated metal pipe emergency spillway has a potential to increase flows over the discharge apron from UC-2. Calculations in Appendix 7-4 should reflect the worst case scenario for the combined flows, 25 year-6 hour flows, discharging from both the sedimentation pond and from the same event flows coming down the undisturbed channel, UC-2.

Diversions and culvert outlets that are expected to have flow velocities in excess of 5 fps will also be equipped with erosion and velocity controls as described in Appendix 7-4.

### **Impoundments**

- The permittee proposes to construct only one sediment pond that will be in the southeast corner of the disturbed area (See Plate 5-2). The sediment pond will have a maximum storage capacity of 12 acre feet and a height of 11 feet. Therefore, the pond does not meet the criteria for an MSHA pond.
- The permittee had the sediment pond design certified by Dan Guy, who is a registered professional engineer.
- In Appendix 5-5 The permittee shows the results of the safety factor analysis. The lowest safety factor is 2.35 for the cut slopes under saturated conditions. The safety factor exceeds the 1.3 requirement.
- The permittee did include the analysis of the physical and engineering properties of the foundation materials.
- The permittee states in Appendix 5-5 that the pond is protected against sudden drawdown. The permittee list four reasons why the pond is protected against sudden drawdown. None of the reasons explain why the pond would be protected against pore pressure in the embankment due to rapid drawdown. The permittee must supply the Division with additional information about how the pond is protected against sudden drawdown. See R645-301-533.300.

The permittee states that the pond design was approved by the State Engineers Office. The permittee must give the Division a copy of the State Engineers' approval letter. See R645-301-521.190.

- The permittee committed to have the external slopes of the impoundment be planted with an approved seed mix to help prevent erosion and promote stability.
- There are no highwalls associated with the impoundment.
- The permittee committed to conduct inspections as stated in the Utah Coal Rules.

### **Casing and sealing of wells**

One well is identified on the site, but is not used. There are no plans for other water wells on this site; however, if any wells are installed in the future, requirements of this section will be met.

#### **Findings:**

Information provided in the proposed amendment is not considered adequate to meet the requirements of this section. Prior to approval, The permittee must provide the following in accordance with:

**R645-301-533.300**, The permittee must show how the pond will be protected against sudden drawdown. Specifically The permittee must show that pore pressure in the embankments will not cause the pond to fail should a sudden drawdown occur. An embankment may be stable under saturated and unsaturated condition but fail during a sudden draw down due to pour pressure.

**R645-301-521.190**, The permittee must give the Division a copy of the letter from the State Engineer stating that the sediment pond design has been approved.

**R645-301-742**, The permittee needs to address the sizing calculations for culvert UC-1, it is sized for a 30 inch diameter culvert whereas, culvert UC-2 just down stream is sized for a 60 inch culvert. It is highly recommended the undisturbed culvert UC-1 be sized in concert with UC-2, required by the Division of Water Rights.

### **SUPPORT FACILITIES AND UTILITY INSTALLATIONS**

Regulatory Reference: 30 CFR Sec. 784.30, 817.180, 817.181; R645-301-526.

#### **Analysis:**

The permittee committed to install and operate all utility installations and support facilities as required by R645-301-526.200

#### **Findings:**

The permittee met the minimum requirements of this regulation.

### **SIGNS AND MARKERS**

Regulatory Reference: 30 CFR Sec. 817.11; R645-301-521.

**Analysis:**

The permittee committed to place signs and markers as required by the Utah Coal Rules.

**Findings:**

The permittee met the minimum requirements of this section.

**USE OF EXPLOSIVES**

Regulatory Reference: 30 CFR Sec. 817.61, 817.62, 817.64, 817.66, 817.67, 817.68; R645-301-524.

**Analysis:**

The Division reviewed the general blasting information and found it adequate. R645-301-524.220 allows The permittee to submit a specific blasting plan separate from the MRP. The permittee has opted to submit a detailed blasting plan later.

**Findings:**

The permittee met the minimum requirements of this section. Under the requirements of R645-301-524.200 The permittee opted to submit the specific blasting plan as a separate submittal. The Division approved The permittee's request to submit the blasting plan as a separate submittal.

**MAPS, PLANS, AND CROSS SECTIONS OF MINING OPERATIONS**

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-512, -301-521, -301-542, -301-632, -301-731, -302-323.

**Analysis:**

**Affected area maps**

Plate 5-5 shows the areas where mining is expected to occur. Plate 5-2 shows the area scheduled to be disturbed. Those maps show the affected area.

The general area hydrology is identified in Plant 7-1. Plates 5-1 and 7-4 identify the effected area for the Lila Canyon area.

**Mining facilities maps**

The following is a list of cross-sections and maps provided in this section of the SR.

- Plate 5-2 Mine Facilities.
- Plate 7-1 Permit Area Hydrology Map
- Plate 7-2 Disturbed Area Hydrology/Watershed
- Plate 7-3 Water Rights Locations

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**OPERATION PLAN**

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- Plate 7-4 Water Monitoring Location Map
- Plate 7-5 Proposed Sediment Control Map
- Plate 7-6 Proposed Sediment Pond
- Plate 7-7 Post-Mining Hydrology

**Mine workings maps**

Plate 5-5 shows the proposed mine plan for the Lila Canyon area. Part of the mine is located outside the proposed permit area. See the southern boundary.

**Monitoring and sample location maps**

Operational ground-water and surface-water monitoring sites are listed in Table 7-3 and locations are shown on Plate 7-4. The proposed surface-water monitoring program will monitor Lila Canyon both above and below the disturbed mine site area at L-1-S, L-2-S, and L-3-S. No monitoring is proposed for Little Park Wash, although it appears to be the major surface drainage in the permit area, because no flow was observed during quarterly inspections in 1998 and 1999.

The sediment pond discharge at L-4-S and the potential mine discharge point at L-5-S will be monitored in accordance with UPDES Permit requirements. Currently monitored UPDES discharge points UT040013- 001A and - 002A are on Plate 7-4.

Five seep and spring ground-water monitoring sites, L-6-G through L-10-G, are proposed. Water levels will be measured quarterly in wells IPA 1, 2, and 3. Locations are shown on Plate 7-4.

**Findings:**

**R645-301-525.490**, The permittee must show on Plate 5-5 or other similar maps those areas where subsidence control methods (first mining only) will be used to protect surface structures such as escarpments, seeps and springs and eagle nests.

**R645-301-521**, The permittee must be consistent with showing the disturbed area boundaries. The permittee needs to explain what the green area on the per mining, operational and reclamation maps is.



# RECLAMATION PLAN

## GENERAL REQUIREMENTS

Regulatory Reference: PL 95-87 Sec. 515 and 516; 30 CFR Sec. 784.13, 784.14, 784.15, 784.16, 784.17, 784.18, 784.19, 784.20, 784.21, 784.22, 784.23, 784.24, 784.25, 784.26; R645-301-231, -301-233, -301-322, -301-323, -301-331, -301-333, -301-341, -301-342, -301-411, -301-412, -301-422, -301-512, -301-513, -301-521, -301-522, -301-525, -301-526, -301-527, -301-528, -301-529, -301-531, -301-533, -301-534, -301-536, -301-537, -301-542, -301-623, -301-624, -301-625, -301-626, -301-631, -301-632, -301-731, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-732, -301-733, -301-746, -301-764, -301-830.

## POSTMINING LAND USES

Regulatory Reference: 30 CFR Sec. 784.15, 784.200, 785.16, 817.133; R645-301-412, -301-413, -301-414, -302-270, -302-271, -302-272, -302-273, -302-274, -302-275.

### Analysis:

The postmining land uses will be the same as premining land uses. This will be accomplished through the reclamation plan presented in other sections of the application. Support activities to achieve the postmining land uses will include site monitoring; remedial actions, such as regrading, reseeding, and replanting; and fencing as necessary to restrict access and grazing.

The postmining land use is in accordance with the Bureau of Land Management's management plans. Appendix 4-2 contains a letter from the Bureau of Land Management stating the postmining land use for the area is wildlife habitat, grazing, and incidental recreation.

### Findings:

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

## APPROXIMATE ORIGINAL CONTOUR RESTORATION

Regulatory Reference: 30 CFR Sec. 784.15, 785.16, 817.102, 817.107, 817.133; R645-301-234, -301-270, -301-271, -301-412, -301-413, -301-512, -301-531, -301-533, -301-553, -301-536, -301-542, -301-731, -301-732, -301-733, -301-764.

### Analysis:

In Section 512.260 the permittee states no variance from the approximate original contours is requested.

### Findings:

The permittee met the minimum requirements of this section.

## BACKFILLING AND GRADING

Regulatory Reference: 30 CFR Sec. 785.15, 817.102, 817.107; R645-301-234, -301-537, -301-552, -301-553, -302-230, -302-231, -302-232, -302-233.

### Analysis:

In Section 537.200 The permittee states:

“Slope rock meeting non-toxic, and non-acid criteria will be used to fill some low areas to be used as pads in the coal pile storage areas. See Plate 5-2. The slope rock material will be treated as underground development waste and disposed of in the slope rock and refuse storage area. The area will be covered with material and re-seeded as per Chapters 2 and 7 and section 540.”

In Section 553.120 the permittee states that since Lila Canyon is an underground operation, no spoil piles will be created. Since the portals will go in under an existing cliff face, no highwalls will be created.

The term highwall was initially defined as a feature of surface coal mining operations. Under the regulations the definition also applies to underground coal mining operations. For underground coal mining operations highwall means the area for entry to underground coal mining activities. Portal face-up areas, dugways, shafts and boreholes for entry into underground coal mining activities are all considered highwalls. By definition the permittee will be creating highwalls when they construct the portals. Usually the Division requires the permittee to backfill and grade the highwall to the MSHA safety bench.

The permittee shows the pre mining, operational and reclamation phases for the portal areas on Plate 5-9. The portals will be cut into existing cliffs and reclaimed to a similar topography. The Division has reviewed the pre mining and reclamation contour maps and found that the proposed plan will eliminate the highwalls.

In Section 553.130 the permittee states that all fill slopes will have a static safety factor of 1.3. In Appendix 5-5 the permittee states that all reclaimed slopes will have a safety factor of at least 1.3. The permittee does not reference any slope stability studies that show the reclaimed slopes will have a static safety factor of 1.3. Appendix 5-5 has slope stability analysis, but none of those studies involve reclaimed slopes.

The permittee will control erosion by constructing berms, channels, silt fences, pock marks, soil tackifiers, and mulch. All runoff will flow to the sediment pond for treatment before leaving the disturbed area.

The permittee states no coal seam will be exposed. The permittee does not state how combustible materials will be handled. The permittee must also specify where any acid or toxic forming materials will be disposed.

The permittee committed to topsoil on the reclaimed slopes. Those areas will be pockmarked to reduce the potential for erosion.

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**RECLAMATION PLAN**

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**Findings:**

Information provided in the proposed amendment is not considered adequate to meet the requirements of this section. Prior to approval, The permittee must provide the following in accordance with:

**R645-301-553.130**, In Section 553.130 the permittee states that all reclaimed slopes will have a static safety factor of at least 1.3. The permittee did not provide the slope stability analysis that supports the 1.3 safety factor claims for the reclaimed slopes. The Division did not receive that information.

**R645-301-121.100**, The permittee must modify the information in Section 553.120 to state the existence of highwalls on site correctly. In that section the permittee claims that no highwalls will be created.

**R645-301-553.300**, The permittee does not address how combustible material and acid and toxic forming materials will be handled, nor how the permittee will handle coal processing waste.

**MINE OPENINGS**

Regulatory Reference: 30 CFR Sec. 817.13, 817.14, 817.15; R645-301-513, -301-529, -301-551, -301-631, -301-748, -301-765, -301-748.

**Analysis:**

The permittee committed in Section 529 of the PAP to seal all underground openings according to Division requirements when no longer needed. Appendix 5-6 has plans for portal sealings. The portals will be sealed according to Division and MSHA requirements.

Mine entries that 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.

**Findings:**

The permittee met the minimum requirements of this section.

**TOPSOIL AND SUBSOIL**

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-240.

## **Analysis:**

Chapter 2, Soils, Sections 240 through 244, discusses the soils reclamation plan for the proposed Lila Canyon Mine. The Analysis section discusses reclamation information as follows:

- Soil Redistribution
- Soil Nutrients and Amendments
- Soil Stabilization

### **Soil Redistribution**

Section 240, Reclamation Plan, describes the steps taken for reclamation. Reclamation will begin once all surface facilities and structures have been demolished and removed. Disturbed areas will be restored to approximate original contour (AOC) using pad material.

Subsoil from Soil Map Units SBJ, DSH, and VBJ used as construction fill need to be identified and used appropriately during reclamation as root zone subsoils. The section of this technical analysis that discusses the operation plan for soils addresses identification of these soils. In Section 232.500, the application says subsoil ranging in thickness from 12 to 30 inches from outslope sites will be used as fill material for site development and replaced in an approximate original sequence during reclamation.

Section 241 says that after AOC is achieved, the disturbed surface will be scarified where practical, prior to soil redistribution. Rippers mounted on the rear of a dozer will be used to "scarify" the disturbed surface. Ripping will be on a minimum of 6 feet spacing. The application needs to say to what depth the area would be ripped.

The applicant needs to give more detail of the grading sequence with regard to subsoil and ripping. It is unclear from the brief discussion of ripping whether the subsoil will be ripped after being replaced or if ripping will only be done on fill before the subsoil is replaced. The Division suggests grading be done in approximately the following order:

- Grade all areas where no subsoil is being stored.
- Replace subsoil on areas from which it was moved.
- Rip the subsoil.
- Replace topsoil.
- Gouge the topsoil.

Soil replacement volumes are shown in Table 5. Soil replacement includes topsoil placement and 4 feet of soil cover over the refuse area. This table does not show volumes of subsoil to be used in pad construction.

**Table 5.** Soil replacement depths and volumes.

Soil Replacement Reclamation Needs	Soil Depth (inches)	Acres	Soil Volume (cubic yards)
Rock Slope & Waste Rock Storage	30^	3.4	13,307
Topsoil* SBG	18	11.10	26,873
Topsoil* VBJ	18	3.87	9,364
Topsoil* XBS	12	3.87	6,250
Topsoil* DSH	18	1.36	3,291
Topsoil* RBL	8	2.35	2,524
Topsoil* RBT	6	0.88	709
Total			62,318

\* Since the A horizons are less than 6 inches, the plan identifies topsoil as the top 18 inches or all material down to shale, whichever is less.

^ Does not include the 18 inch topsoil placement.

After topsoil redistribution, pocking will be the primary method for roughening the surface. Pocking is described in Figure 1, Appendix 5-8, as imprinting the soil surface with a pattern of depressions measuring approximately 36 inches across by 8 inches deep. The purposes for pocking are to capture and retain moisture and to provide a cradle for seedlings and vegetation. Best available technology will be used for enhancing the ability of the soil to absorb moisture.

Section 242.100 says previously stockpiled topsoil will be redistributed on the same areas in a thickness which approximates the reclaimed thickness on the scarified, post-mining graded surface. The plan states that every reasonable effort will be made to replace the same thickness of salvaged soil to each respective area.

On flat areas, soil will be reapplied using road grader and/or crawler tractor. On steep slope areas, soil will be reapplied using a front-end loader, crawler tractor, and/or trackhoe. Boulders will be replaced to achieve a near natural surface condition. Alleviating or minimizing soil compaction is not discussed.

### Soil Nutrients and Amendments

Section 241 states that an inoculum will be applied to the soil to help assist in reactivating and regenerating soil activity for soil organisms, bacteria, microhorizia and mycelium. The seed mixture will be either hand broadcast over the area and raked into the soil surface, or sprayed on the surface using hydro-mulch. A wood fiber mulch will be hydro sprayed over the seed bed, then the surface will be sprayed with a tackifier. The tackifier will be applied at a rate of 50 pounds per acre. The revegetation section of this technical analysis contains further discussion of revegetation methods to be used at this mine.

Section 231.300 and Section 243 state that topsoil will be sampled and tested prior to replacement to determine what nutrients are necessary at reclamation time. Major nutrients include nitrogen, phosphorus and potassium content. Grab samples will be collected from the stockpile at various locations and depths. Fertilizer, if needed, will be applied to the topsoil prior to seeding and mulching activities. Sampling will

either be performed by a Certified Soil Scientist, or by a person qualified by the operator and the Division of Oil, Gas and Mining.

### **Soil Stabilization**

Section 244.100 states that vegetation will be the primary method for controlling erosion and fugitive dust. Other measures that will help in erosion control and soil stabilization is pocking and rock placement.

Section 244.200 states that pocking will be the primary method used to roughen the soil surface as per Figure 1 in Appendix 5-8. In addition, wood fiber mulch will be applied at a rate of 2,000 pounds per acre to the reclaimed areas that have been graded and covered by topsoil or substitute topsoil. The wood fiber mulch will be tacked to the surface with a tackifier.

### **Findings:**

Information provided in the application is not considered adequate to meet the requirements of this section of the regulations. The applicant must provide the following in accordance with:

**R645-301-241 and R645-301-242**, The applicant needs to specify how deeply the area would be ripped. Also, the applicant needs to give more detail of the grading sequence with regard to subsoil and ripping.

## **ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES**

Regulatory Reference: 30 CFR Sec. 701.5, 784.24, 817.150, 817.151; R645-100-200, -301-513, -301-521, -301-527, -301-534, -301-537, -301-732.

### **Analysis:**

The permittee committed to reclaim all roads including removal of bridges and culverts in the disturbed area. The road surfaces will be removed and buried on site and covered with a minimum of two feet of material. The roads will be ripped and top soiled before seeding.

### **Findings:**

The permittee met the minimum requirements of this section.

## **HYDROLOGIC INFORMATION**

Regulatory Reference: 30 CFR Sec. 784.14, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-301-512, -301-513, -301-514, -301-515, -301-532, -301-533, -301-542, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-733, -301-742, -301-743, -301-750, -301-751, -301-760, -301-761.

### **Analysis:**

**Ground-water monitoring**

Ground-water monitoring will continue through mining and reclamation until bond release (Section 731.214).

**Surface-water monitoring**

Surface-water monitoring will continue through mining and reclamation until bond release. Locations, parameters and/or sampling frequency (other than UPDES discharge points) may be modified by the Division

**Acid and toxic-forming materials**

Any material which exhibits acid- or toxic-forming characteristics will be properly stored, protected from runoff, removed to an approved disposal site or buried on site beneath a minimum of 4' of non-acid, non-toxic material.

**Transfer of wells**

There are presently no plans to transfer any wells to any other party. There are presently three monitoring wells on this permit. When these wells are no longer required, they will be sealed in a safe, environmentally sound manner in accordance with regulations (see Section 631.200

**Discharges into an underground mine**

No discharges planned to underground mines.

**Gravity discharges**

Section 731.520 explains why gravity discharges from the mine are not expected after mine closure.

The coal seam to be mined dips away from the portal site at approximately 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.

**Water quality standards and effluent limitations**

A reclamation surface and groundwater was not submitted.

**Diversions**

All disturbed and undisturbed area diversions will be removed during the backfilling and recontouring reclamation period. The permittee has not provided plans to show how Culvert UD-2 will be removed and a headwall established to direct flows under the roadbed.

**Stream buffer zones**

There will be no development within 100 feet of a perennial stream.

### **Sediment control measures**

Upon completion of operations, the disturbed area will be reclaimed. All drainage and sediment controls are considered temporary and will be removed when no longer required. The sediment pond will remain in place until Phase II Bond Release requirements have been met. At that time, the pond will be removed and the area will be reclaimed in accordance with the approved plan.

Upon removal of the sediment pond, the area will be regraded and revegetated in accordance with the approved reclamation plan.

### **Siltation structures**

See Appendix 7-4 for details on removal of siltation structures.

As indicated in Section 761, the sediment pond will remain in place until the stability and vegetation requirements for Phase II Bond Release are met. This will be a minimum of 2 years after the last augmented seeding. At this time, the pond will be removed and the area reclaimed.

### **Sedimentation ponds**

The proposed sediment pond is considered temporary, and will be removed during final reclamation. The pond is designed in compliance with the requirements of the following sections, as required:

The pond will be maintained until the disturbed area has been stabilized and revegetated. Removal shall not be any sooner than 2 years after the last augmented seeding;

Upon removal, the pond area will be reclaimed and reseeded according to the reclamation plan.

### **Discharge structures**

The sedimentation will be used until Phase II bond release is received. Then the pond will be removed, the area recontoured and revegetated.

### **Impoundments**

No impoundments will be left on site after reclamation.

### **Casing and sealing of wells**

The permittee has committed to reclaim any existing wells in an environmentally sound manner. No well will be transferred.

### **Findings:**

**R645-301-521**, The permittee should show detailed plans showing how the Culvert UD-2 will be removed and a headwall installed to transmit flows under the roadbed.

## REVEGETATION

Regulatory Reference: 30 CFR Sec. 785.18, 817.111, 817.113, 817.114, 817.116; R645-301-244, -301-353, -301-354, -301-355, -301-356, -302-280, -302-281, -302-282, -302-283, -302-284.

### Analysis:

#### Revegetation Plan

Table 3-3 in Chapter 3 is a general reclamation timetable. According to this timetable, seeding and mulching would begin about the first of October, depending on the weather, and seedlings would be planted about the first of November. Except as discussed below, these are the normal times for planting, and the schedule is acceptable.

Blue grama and galleta are two of the dominant grasses in the area proposed to be disturbed, and they are both warm season grasses. Other mines in Utah have had a great deal of difficulty establishing these species on reclaimed sites, and this may be because they are often seeded in the fall. Mines in New Mexico and Arizona usually seed these species in the summer to take advantage of late summer rains, but, to the Division's knowledge, no Utah mines have attempted to establish these species by planting them in the summer.

The applicant has committed to establish test plots to test whether summer seeding will increase establishment of the warm season species. With this commitment, the Division is willing to accept the plan to seed in the fall. Further details of the test plot plan are discussed in the "Field Trials" section of this analysis.

Following demolition, the area would be regraded to approximate original contour. These areas will then be ripped 18 inches deep and disced. Topsoil will then be distributed to depths from six to eighteen inches as discussed in Chapter 2.

It is vital that there be soil for plants to have adequate rooting depth. Studies of plant phenology have clearly shown plants in arid areas use soil water from increasing depths as the growing season continues, and if there is inadequate rooting depth, production and vegetative cover will decrease.

Any soils not salvaged and protected would be subject to contamination from mine operations, compaction, and mixing with unsuitable materials. Some of the deeper subsoils, below the roots, have very high (>65%) rock contents, and some are derived from marine shales that could severely limit vegetation establishment and growth. If these materials were in the rooting zone, it would be difficult or impossible to achieve revegetation success.

Following topsoil redistribution, the soil will be tilled until large clods on the surface are diminishing. Tilling the soil to reduce the number and size of clods has not been necessary at other Utah mines because clods are broken up as the soil is redistributed, but a limited amount of tilling would probably not be detrimental. Gouging or pocking (see below) would also serve to break up large clods.

According to Section 553.230, surface preparation will include pock marking to minimize the potential for erosion and to enhance vegetation establishment. Because of the limited precipitation, the

Division considers surface roughening to be essential at this site. Figure 1 in Appendix 5-8 is diagrams of pock mark configurations.

Appendix 5-8 says that in conjunction with pock marking, the track hoe can cast any vegetation, dead trees, and large rocks back onto the reclaimed surface. This debris provides solar protection but also increases available moisture in small areas and increases topographic and vegetation diversity.

The seed mixture for final reclamation is shown in Table 3.4/3.5. It consists of 22 species, 19 of which are native to the area. The introduced species are yellow sweet clover, alfalfa, and prostrate kochia, and the application discusses the reasons for using these species. Based on the reasons in the application, the Division can allow using these three species.

There is controversy whether yellow sweet clover should be included for revegetation, but the applicant would apply it at a rate of only 0.5 pounds per acre for broadcast seeding and half this rate for drilling. At this rate, it should not dominate the site or spread to adjacent areas. The application says yellow sweet clover has proven beneficial in rapid establishment on marginal sites and that, as a legume, it should be able to fix nitrogen. The application includes a commitment to use inoculated seed.

Alfalfa was recommended by the Division of Wildlife Resources, and because this site is marginal for alfalfa, it should not be overly aggressive. Forage kochia is desirable as a forage species and because there is evidence it competes well with downy brome, a weed that dominates much of the proposed disturbed area.

The seeding rate shown in Table 3.4/3.5 is about 125 seeds per square foot for areas that are broadcast seeded and half this rate for drill seeded areas. This is a little higher than the rate recommended by the *Interagency Forage and Conservation Planting Guide for Utah* but is acceptable.

Appendix 5-8 says that if seeding does not result in shrub densities exceeding the success standard, bare root or containerized seedlings may be planted at a rate of approximately 200 per acre. The ratio and species would be determined by the Bureau of Land Management and the Division of Wildlife Resources. The application gives adequate details of when and how seedlings would be planted.

If the applicant plants any seedlings, the species and rates would need to be approved by the Division and this information included in the application or mining and reclamation plan. The discussion in the application is for a conceptual plan, and although the Division can approve the concept as written, details would need to be approved before being implemented.

Section 341.220 says seed and fertilizer will be broadcast by hand or with a rotary seeder. A light cover of soil will be spread over broadcast seed. Although this section seems to indicate the entire area would be broadcast seeded, there is a paragraph discussing calibration of seed boxes indicating a drill might be used. Appendix 5-8 and the August 23, 2000, response letter say the area will be hydroseeded, and although hydroseeding is a form of broadcast seeding and is acceptable, it is not the same as broadcasting by hand or with a rotary seeder. The applicant needs to clarify what seeding methods will be used. Any one or a combination of these broadcast seeding methods is acceptable, but the application needs to be consistent. Drill seeding is likely to decrease surface roughening and should not be used.

According to Chapter 3, the site will be mulched with 2000 pounds per acre of wood fiber mulch with 60 pounds per acre of a tackifier. Appendix 5-8 (which was not modified in the September 2000

submittal) says 500 pounds per acre of wood fiber mulch and 100 pounds per acre of tackifier will be applied with the seed followed by application of an additional 1500 to 2000 pounds per acre of mulch and 100 pounds of tackifier. The application needs to be consistent.

There will be no irrigation, and no pest or disease control measures are planned. The Division does not anticipate irrigation will be necessary as long as water harvesting methods are used. There are no serious pest control problems in the area of which the Division is aware, so, hopefully, no control measures will be necessary.

Section 357.301 says the Lila Canyon Mine would like to reserve the right to apply for augmentation of reclaimed areas thus extending the bond liability period on a site specific case scenario. This statement is acceptable but unnecessary. The regulations in R645-301-357 are designed to allow a limited amount of reseeding and other work for specific purposes without lengthening the extended liability period.

### **Success Standards**

The reference area for the mine site disturbance was established adjacent to the proposed facilities during the summer of 1999, and, in Section 341.250, the application refers to Plate 3-1. Plate 3-1 shows wildlife habitats in the general area but does not show the reference area. Figure 1 in the report for the 1999 vegetation survey shows the reference area location. The reference in the application to Plate 3-1 should be corrected or could just be deleted. The application also says this reference area was chosen with the help of DOGM. This statement is not correct and should be eliminated. While a Division representative has been reviewing the success standards, the applicant did not seek or receive input from the Division when the reference area was being chosen.

The grass/shrub reference area is similar in most respects to the proposed disturbed grass/shrub areas, and it is considered an acceptable success standard. At the time of final reclamation, the range condition of the reference area will need to be reevaluated to ensure it is still in fair or better range condition. In the meantime, the reference area needs to be marked and should not be disturbed without first designating another revegetation success standard. The Division recommends the reference area be checked every five years to help ensure it remains in fair or better condition.

The applicant is proposing to use the grass shrub reference area as a success standard for the pinyon/juniper community. Pinyon/juniper areas generally provide relatively little forage for wildlife or livestock compared to a grass/shrub community, and the Division considers the proposal acceptable. The applicant has not presented enough data to statistically compare vegetation cover values between the reference area and the proposed disturbed pinyon/juniper area, but cover in the reference area was measured at over twice the value in the pinyon/juniper area. This may be a difficult standard to achieve, but it is not unrealistic since there will be a different vegetation community in the pinyon/juniper area.

The Division is required in R645-301-356.230 to consult with the Division of Wildlife Resources and gain approval for the tree and shrub density standard for success. The standard set in consultation with Wildlife Resources is 1500 per acre, and this standard has been included in the application. The standard was based more on the species expected to become established in the area than on the existing vegetation.

Section 341.250 discusses success standards for diversity, seasonality, and erosion control. To judge diversity, every species with more than 20% frequency would be classified into a life form. The standard is that the reclaimed area must have at least as many species in each life form, except introduced and

undesirable species, as the reference area. The reclaimed and reference areas would not need to have exactly the same species. Life form categories would be native grass, native broadleaf forb, native shrub, desirable introduced, and undesirable species. Undesirable species are those generally classified as weeds or that are poisonous to livestock or wildlife. For seasonality, the life form categories would simply be warm and cool season. This is a relatively easy standard to measure and is acceptable.

Although the numbers may be different when reference area vegetation is measured for bond release, the diversity standard according to information gathered in 1999 would be two shrub species, one broadleaf forb, and six grasses. In addition, two undesirable species were encountered with greater than 20% frequency. There were three warm season species, five cool season, and one species (purple three-awn) about which no information on seasonality was found.

The proposed erosion standard is that vegetation will have demonstrated its erosion control effectiveness when UPDES effluent standards are met. All drainages leading away from the permit area would be sampled as often as practical. This standard is considered acceptable.

### **Field Trials**

The application says the methods outlined have a proven performance based on the successful reclamation of the Horse Canyon Mine. Section 354 discusses timing of seeding for blue grama and galleta. The applicant will use these species in the interim seed mix adjacent to the sediment pond. The west half of the pond disturbance will be seeded in mid-summer following construction. The east half will be seeded in the late fall. The line separating these two areas will be staked, and ocular estimates of reclamation success will be taken each fall for three years. If there appears to be a difference in the two areas, quantitative samples will be taken. If it is possible to derive a conclusion about timing of seeding, the reclamation plan can be modified at the time of permit renewal.

### **Wildlife Habitat**

The application says the sediment pond will be maintained through the life of the operation and will be removed when effluent criteria are met after reclamation. Sections 761 and 763.100 indicate the sediment pond will remain in place until the stability and vegetation requirements for Phase II Bond Release are met and that this will be a minimum of 2 years after the last augmented seeding.

A water source in this area would serve as a wildlife habitat enhancement; however, it is not known whether the pond would actually contain water a significant part of the year and would thus serve as an enhancement. It is also not known whether the water quality would be suitable for wildlife use. Even if it does contain water, the enhancement would only be temporary.

The species in the seed mixture will potentially provide good forage and cover for wildlife. The pinyon/juniper area will be reclaimed to a grass/shrub community, and this should enhance the quality of habitat in the area. There are plenty of pinyon/juniper areas nearby to provide cover, but the greatest need is the increased forage that would be provided in a grass/shrub area.

### **Findings:**

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**RECLAMATION PLAN**

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Information provided in the proposal is not considered adequate to meet the requirements of this section of the regulations. Prior to final approval, the applicant must provide the following in accordance with:

**R645-301-341.220**, Section 341.220 says seed and fertilizer will be broadcast by hand or with a rotary seeder. A light cover of soil will be spread over broadcast seed. Although this section seems to indicate the entire area would be broadcast seeded, there is a paragraph discussing calibration of seed boxes indicating some areas would be drill seeded. Also, Appendix 5-8 says the reclaimed area will be hydroseeded. The applicant needs to clarify what seeding methods will be used. Since drill seeding is likely to decrease surface roughening, this method should not be used.

**R645-301-341.230**, The rates of tackifier application shown in Section 341.230 and Appendix 5-8 need to be consistent.

**R645-301-323**, The application says the revegetation reference area is shown on Plate 3-1, but this statement needs to be corrected or eliminated. The reference area is shown on Figure 1 of the report for the 1999 vegetation inventory. Also, the application has a statement that the reference area was chosen with the help of DOGM, and this is not correct.

## **CESSATION OF OPERATIONS**

Regulatory Reference: 30 CFR Sec. 817.131, 817.132; R645-301-515, -301-541.

### **Analysis:**

The permittee committed to comply with R645-301-515 and R645-301-541 for temporary and permanent cessation. If temporary cessation will last more than 30 days the permittee will notify the Division. After permanent cessation the permittee committed to remove all equipment and surface structures.

### **Findings:**

The permittee met the minimum requirements of this section.

## **MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS**

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-323, -301-512, -301-521, -301-542, -301-632, -301-731.

### **Analysis:**

#### **Affected area boundary maps**

Plate 5-4 shows the boundaries of all lands that are expected to be affected by the Lila Canyon project. Plate 5-6, and Plate 5-7A and Plate 5-7B show the reclamation topography and cross section. Since

the reclamation work will be completed in 6 months, The permittee does not need to show the timing and sequence of reclamation.

**Bonded area map**

Plate 5-6 shows the area for which a reclamation bond will be posted.

**Reclamation backfilling and grading maps**

Plate 5-6, and Plate 5-7A and Plate 5-7B show the reclamation contours and cross sections.

**Reclamation facilities maps**

The permittee will not leave any facilities after final reclamation. Therefore, such a map is not needed.

**Final surface configuration maps**

Plate 5-6 shows the proposed final surface topography.

**Reclamation monitoring and sampling location maps**

Plate 7-4 identifies surface and ground water monitoring sampling locations.

**Reclamation surface and subsurface manmade features maps**

The permittee does not propose to leave any surface or subsurface manmade features in the reclaimed area.

**Reclamation treatments maps**

**Findings:**

Information provided in the proposed amendment is not considered adequate to meet the requirements of this section. Prior to approval, The permittee must provide the following in accordance with:

**R645-301-542,** The permittee must give the Division detailed cross section of the reclaimed surfaces. The current cross section are at such a small scale that the Division cannot determine what reclamation activities will occur.

**BONDING AND INSURANCE REQUIREMENTS**

Regulatory Reference: 30 CFR Sec. 800; R645-301-800, et seq.

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**RECLAMATION PLAN**

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**Analysis:**

**Form of bond (Reclamation Agreement)**

**Determination of bond amount**

The Division will not review this section until the reclamation plan has been approved.

**Terms and conditions for liability insurance**

**Findings:**

The Division will review this section after the reclamation plan has been approved.



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**SPECIAL CATEGORIES OF MINING**

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**PRIME FARMLAND**

Regulatory Reference: 30 CFR Sec. 785.16, 823; R645-301-221, -302-300 et seq.

**Analysis:**

There will be no mining operations conducted in Prime Farmlands during the proposed life of this significant revision.

**Findings:**

The permittee has submitted sufficient information for this section.

**OPERATIONS IN ALLUVIAL VALLEY FLOORS**

Regulatory Reference: 30 CFR Sec. 822; R645-302-324.

**Analysis:**

There will be no mining operations conducted in Alluvial Valley Floors during the proposed life of this significant revision.

**Findings:**

The permittee has submitted sufficient information for this section.



## CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

Regulatory Reference: 30 CFR Sec. 784.14; R645-301-730.

The Division will provide an assessment of the probable cumulative hydrologic impacts (CHIA) of the proposed operation and all anticipated mining upon surface- and ground-water systems in the cumulative impact area. The CHIA will be sufficient to determine, for purposes of permit approval, whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area. The Division intends to use data and analyses submitted by the permittee in the Lila Canyon Significant Revision.

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