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

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March 9, 2001

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

Re: Review of the January 19, 2001 Submittal for the Lila Canyon Significant Revision,
UtahAmerican Energy, Inc., Horse Canyon Mine, C/007/013-SR98(1)-5, Outgoing File

Dear Mr. Coonrod:

The Division has completed our review of the January 19, 2001 submittal to permit the Lila Canyon Tract as part of the Horse Canyon Mine. A Technical Analysis (TA) of your application is enclosed.

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 continue processing your application, please submit your response by April 13, 2001. If you have any questions, or would like to set up a meeting to discuss the deficiencies, please feel free to call me at (801) 538-5325, or Dave Darby at (801) 538-5341

Sincerely,

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

Daron R. Haddock
Permit Supervisor

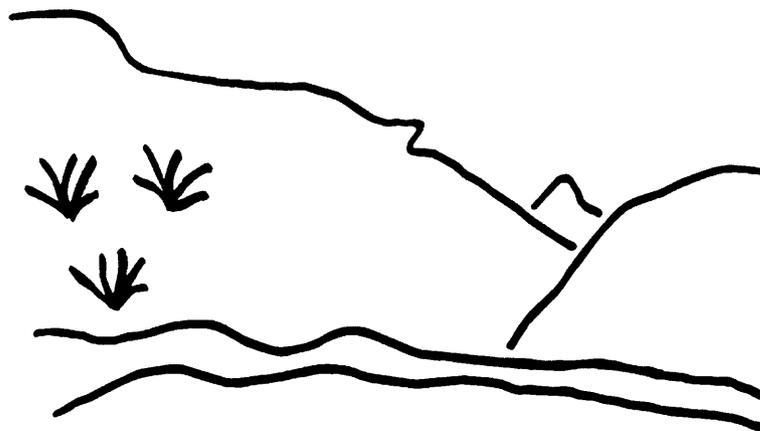
dwd/sm

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 Significant Revision
C/007/013-SR98(1)-5
Technical Analysis
March 8, 2001

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INTRODUCTION

INTRODUCTION

The BLM (Bureau of Land Management) established the North Block LMU (Logical Mining Unit) where UtahAmerican (UtahAmerican Energy, Inc) proposes 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. The North Block LMU was submitted by the BLM on November 23, 1993 and approved on January 1, 1994.

The SR for the Lila Canyon was received by the Division 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. A fourth round was submitted on September 25, 2000. The latest submittal was submitted on January 20, 2001.

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.

INTRODUCTION

SUMMARY OF OUTSTANDING DEFICIENCIES

SUMMARY OF OUTSTANDING DEFICIENCIES

The Technical Analysis regarding the proposed permit changes is not complete at this time, pending submittal of additional information by the permittee and further review by the Division, to address outstanding deficiencies in the proposal. A summary of those outstanding deficiencies is provided below. Additional comments, concerns, and deficiencies may also be found withing the analysis and finding make in the Draft Technical Analysis which have not been presented in this summary. Upon finalization of this review, any outstanding deficiencies will be evaluated for compliance with the regulatory requirements. Such deficiencies may be conditioned to the requirements of the permit issued by the Division, result in denial of the proposed permit changes, or may result in other executive or enforcement actions as deemed necessary by the Division at that time to achieve compliance with the Utah Coal Regulatory Program.

Accordingly, the permittee must address those deficiencies as found within this Draft Technical Analysis and provide the following, prior to approval, in accordance with the requirements of:

- R6454-301-742 The applicant needto submit detailed plans of sediment control measures for the fan area. 82
R645-301-112.200, It appears the address listed in Section 112.210 needs to be updated. 10
R645-301-112.500, According to Plate 5-4, Robert Pepper owns coal rights within the existing permit area, but this information is not reflected in the text. This discrepancy needs to be corrected. 10
R645-301-112.700, The application needs to include the MSHA number for the refuse pile. 10
R645-301-114, The application needs to include right of entry information for the portions of the proposed revised permit area in the E1/2 SE1/4 and SW1/4 of Section 15 of Township 16 South, Range 14 East, the proposed facilities area. The Division would be able to issue its permit simultaneously with the Bureau of Land Management issuing its right of way, but since the decision record for approval of the right of way is currently in litigation, neither the right of way nor the permit can be approved. 12
R645-301-116, The application needs to contain acreage figures for both the current permit area and for the proposed addition. It also needs to show the number of acres owned by different land owners, both mineral and surface. 13
R645-301-120, The applicant needs to provide copies of the original letters from the Bureau of Land Management, including letterhead, dates, and signatures, rather than retyped copies. 12
R645-301-122, The permittee must supply the Division with a copy of the R2P2 since they reference the document in the coal recovery and subsidence section of the

SUMMARY OF OUTSTANDING DEFICIENCIES

permit. The Division will store the R2P2 in the confidential file upon request. 56

R645-301-231.100 and R645-232.500 Use pedestals or other survey method to verify subsoil salvage depth according to Salvageable Soils Map Appendix A-2 and provide an As-Built map showing the location and volume of the subsoil stored in the pad for use as additional rooting media. 69

R645-301-232, Salvage soil from all areas that would be disturbed by coal mining and reclamation activities including the access road to the topsoil pile and around the topsoil pile location. 69

R645-301-234.100 Outline how soil from the fan site will be salvaged. 69

R645-301-241 and R645-301-234.300 through R645-301-234.320, Identify areas where subsoil from Soil Map Units SBJ, DSH, and VBJ was used as construction fills. Replace subsoil "construction fill" during reclamation as root zone subsoils. () Identify pad and mine areas containing subsoil "construction fills" that will be graded to AOC. (2) Identify methods to ensure that subsoil "construction fills" are used appropriately as root zone soils. 91

R645-301-241 and R645-301-242, Specify the depth of ripping and provide detail of the sequence of ripping and subsoil placement. i.e. ripping comes after grading, but before subsoil rooting medium placement. 91

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 be consistent. . . . 21

R645-301-331 Remove ditch DD-1 from the Mining and Reclamation plan in an effort to disturb the smallest practicable area. 69

R645-301-512.100 The operator should identify on a Plate 7-5, how any mine water discharge would be transported from the portal to the stream channel. 84

R645-301-512.120 Verify the direction of the North Arrow on Plate 5-8. 69

R645-301-521.133 and R645-301-526.116, The permittee must show that the public will be protected from mining activities that occur within 100 feet of the public road. The permittee must show 1) that public will be protected from the southern portion of the pond that is within 100 feet of the public road, and 2) the location of the right-of-way for the road on Plate 5-2, the Division needs that information to determine if the fence and pond are in the proper locations. 55

SUMMARY OF OUTSTANDING DEFICIENCIES

- R645-301-521.162 and R645-301-232.100** Clearly identify the proposed disturbed area on all maps and salvage topsoil from areas designated to be disturbed. i.e. compare DA-1 and DA-9 shown on Plate 7-2 with the same areas on Plate 2-3. 69

- R645-301-521**, The applicant must entitle one map The Disturbed Area Map and that map must show the disturbed area boundaries. That map will then be referenced for all disturbed area changes. 49

- R645-301-521**, The disturbed area boundaries shown on Plate 5-2 and other maps must ~~be~~ show the areas where the permittee will or is likely to cause surface disturbance. The permittee needs to include the following areas into the disturbed area 1) there must be access to the sediment pond, the permittee does not have access to the pond on the west side because of the chain link fence and the land on the south, east and north side is all undisturbed, 2) the disturbed area boundary must include culvert UC-1 and all of culvert UC-2, 3) ditches DD-1 and DD-12 must be included in the disturbed area, when Plate 7-5 and Plate 5-2 are over laid those ditches are shown to be outside the disturbed area boundary. 84

- R645-301-522 and R645-301-525.240**, The permittee must give the Division a detailed coal recovery plan. That plan must include the coal extraction ratios and the calculations for the longwall areas, full extraction room-and-pillar areas and first mining only areas. A copy of the R2P2 or a mine plan approval letter from the BLM would help the Division make a finding about coal recovery. 56

- R645-301-525.440 and R645-301-121.200**, The permittee must clearly state how long the subsidence monitoring program will last and under what circumstances the program will be terminated. The subsidence monitoring program must last a minimum of 5 years. Before the subsidence monitoring program is terminated there must be a minimum of 3 consecutive years where the annual subsidence is less than 10% of the highest annual subsidence. 59

- R645-301-536** a) Adjust Figure 2, Appendix 5-7 cross sections to show that the rock slope/refuse pile blends into the surrounding terrain; and, b) Add a cross section showing the profile of the rock slope/refuse pile. 69

- R645-301-542**, The permittee must give the Division detailed cross section of the reclaimed surfaces. The cross section must also show highwall elimination. 100

- R645-301-553.120**, The permittee must change the wording in Section 553.120 to show that all highwalls will be eliminated. Since the site is Post-SMCRA no highwall or highwall remnants can be left. 87

- R645-301-553.120**, The permittee must include Appendix 5-6 so that the Division can review the highwall elimination plan. Appendix 5-6 must have cross section for each portal so that the Division can determine if that will be properly reclaimed. 87

SUMMARY OF OUTSTANDING DEFICIENCIES

R645-301-553.252 Provide information on the details of testing of rock slope waste and other refuse: at what frequency will the gob be sampled? And what parameters will be analyzed? 69

R645-301-724, -731.200, (1) A ground-water monitoring program was implemented in July 2000: in December 2000, UtahAmerican was able to measure the water level in IPA-2, but at IPA-1 and IPA-3 the probe was not able to go far enough into the wells to reach water. **(2)** The permittee has not presented plans to repair, recondition, or replace these wells: the proposed ground-water monitoring plan, as written, cannot be carried out without IPA-1 and IPA-3. **(3)** A continuing effort should be made to recover IPA-1 and IPA-2 as monitoring wells. **(4)** Instead of drilling additional wells to monitor the status of the aquifer, combining information from IPA-2, the remaining well, with accurate measuring and accounting of water entering the mine, of water pumped from one location to another for storage within the mine, of water consumed by mine operations, and especially of the volume of water discharged from the mine would provide very useful information regarding the impact of the mine operations on ground water. 44

R645-301-724, -731.200, A ground-water monitoring program was implemented in July 2000: L-6-G (H-18, HC-18, EWL-25), L-7-G (9, S-9), L-8-G (10, S10), L-9-G (16, 16Z, S-16), and L-10-G (14, S14) were to have been monitored to determine if these springs were still viable and to establish a current baseline that would be continuous with operational monitoring (page 30, Chapter 7). No data for L-6-G through L-10-G have been received by UDOGM for this recent monitoring, neither with the most recent version of the plan revision nor with the quarterly reports. 44

R645-301-724, -731.200, There are no baseline data, not even reports stating “no-flow”, for L-1-S, L-2-S, and L-3-S in Lila Canyon, nor for surface water anywhere in the Lila Canyon drainage. A monitoring program was to have been implemented in July 2000 (pages 7 and 30): no data for L-1-S, L-2-S, and L-3-S have been received by UDOGM for this recent monitoring program, neither with the most recent version of the plan revision nor with the quarterly reports. 44

R645-301-724, -731, The Lila Canyon Significant Revision does not include an explicit commitment to analyze ground- and surface-water samples for baseline parameters preceding each 5-year permit renewal. A commitment to do these analyses is included in Appendix VI-5 of the current Horse Canyon Mine MRP, but the commitment should be repeated in the Lila Canyon Significant Revision. UDOGM directive Tech 004 indicates these permit-renewal baseline analyses should be done for the surface-water samples collected at either high or low flow and for the spring samples collected at low flow during the year these analyses are done. 45

R645-301-731 Map 7-6 needs to be corrected to show the main stream channel connecting to culvert UC-2. 82

SUMMARY OF OUTSTANDING DEFICIENCIES

R645-301-731 The operator should describe how undisturbed drainage above the disturbed areas DA-1 and DA-2, shown on Plates 7-2 and 7-5, will be diverted or controlled. 81

R645-301-731 The operator should describe the need for the disturbed drainage ditch, DD-1 which captures undisturbed drainage, to route disturbed area drainage away from the disturbed area. The area identified as DA-1 on Plate 7-2 is identified as undisturbed Plate 5-2. If the area (DA-1) is undisturbed does it need a diversion ditch (DD-1)? 81

R645-301-731 The operator should identify which channel will be receiving any excess mine water production and identified the method of transport from the discharge site to the channel. 81

R645-301-731 The permittee should identify which drainage will receive mine water discharge in the event excessive mine water volumes are encountered beyond what is usable in the mine. 95

R645-301-742 The applicant needs to identify sediment control or treatment measures for the fan area. 95

R645-301-830.140, The permittee must give the Division detailed reclamation cost estimates based on the OSM reclamation bond calculation handbook. The permittee states that the reclamation cost estimates are in Chapter 8, Appendix 8-1. However, the January 19, 2001 submittal did not include Chapter 8 or Appendix 8-1. 101

SUMMARY OF OUTSTANDING DEFICIENCIES

ADMINISTRATIVE INFORMATION

OWNERSHIP AND CONTROL INFORMATION

Regulatory Reference: R645-301-112

Analysis:

The permittee 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 permittee. UtahAmerican will pay the abandoned mine reclamation fee

It appears the address listed in Section 112.210 is no longer current. This address is P. O. Box 986, Price, Utah. In December 2000, the Division sent certified mail to this address, and it was returned. Elsewhere in the application, such as in Section 112.500, the address is shown as being in Clairsville, Ohio.

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. While there are several affiliated companies, UtahAmerican Energy, Inc., is only owned by one company, Coal Resources, Inc.

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 permittee or by any person that owns or controls the permittee, 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, 5-3, and 5-4 show surface and coal ownership in and contiguous to both the existing permit area and the proposed addition. According to Plate 5-4, Robert Pepper owns coal rights within the existing permit area, but this information is not reflected in the text. Otherwise, the information on the surface and subsurface ownership maps appears to be consistent with the text.

The application shows MSHA identification numbers for both the Horse Canyon and Lila Canyon Mines, but it does not include a number for the refuse pile. There is a note taped into the

application indicating the applicant is currently working with MSHA to obtain the identification number. The note also says MSHA indicates only the portion of the pile with "coal mine waste" will require an identification number and that the portion with rock from the rock slopes will not. The Division can continue its review in anticipation that the necessary approval is forthcoming. In the past, the Division has even approved a mine plan contingent on not constructing facilities not approved by MSHA; however, this portion of the application remains deficient. The applicant needs to continue trying to obtain the needed approvals.

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 permittee 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:

R645-301-112.200, It appears the address listed in Section 112.210 needs to be updated.

R645-301-112.500, According to Plate 5-4, Robert Pepper owns coal rights within the existing permit area, but this information is not reflected in the text. This discrepancy needs to be corrected.

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

VIOLATION INFORMATION

Regulatory Reference: 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 permittee violator system, but it appears the application contains the required information to comply with R645-301-113.

ADMINISTRATIVE INFORMATION

Findings:

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

RIGHT OF ENTRY

Regulatory Reference: R645-301-114

Analysis:

UtahAmerican Energy leases 5544.01 acres of federal coal. The bureau of Land Management has approved transfer of the federal leases from Intermountain Power Agency to UtahAmerican. 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.

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

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 permittee must provide the following in accordance with:

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 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. The Division would be able to issue its permit simultaneously with the Bureau of Land Management issuing its right of way, but since the decision record for approval of the right of way is currently in litigation, neither the right of way nor the permit can be approved.

R645-301-120, The applicant needs to provide copies of the original letters from the Bureau of Land Management, including letterhead, dates, and signatures, rather than retyped copies.

UNSUITABILITY CLAIMS

Regulatory Reference: 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 includes a letter from Emery County documenting this approval. The letter signed by Rex Funk says UtahAmerican is authorized to conduct mining activities within 100 feet of the public road. A 6-foot chain link fence needs to be installed adjacent to the road right of way near the surface facilities area.

Findings:

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

PERMIT TERM, INSURANCE, PROOF OF PUBLICATION, AND FACILITIES USED IN COMMON

Regulatory Reference: R645-301-116 and -117

Analysis:

The permit term for which the permittee 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.

ADMINISTRATIVE INFORMATION

Table 4-2 in Chapter 4 is titled "Permit Area Description Both Horse Canyon and Lila Canyon," but the descriptions and acreage figures in the table are not just for the permit area. The legal descriptions and acreage figures in Table 4-2 are for blocks of land, such as quarter-quarter sections and lots. The boundaries for the current permit area and the proposed addition do not always follow these boundaries; they are often irregular and follow mine workings. Therefore, the acreage figures shown in Table 4-2 include a larger area than the permit area. The applicant needs to supply acreage figures for the permit area not including adjacent areas.

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

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

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

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:

R645-301-116, The application needs to contain acreage figures for both the current permit area and for the proposed addition. It also needs to show the number of acres owned by different land owners, both mineral and surface.

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Revised: March 8, 2001

ADMINISTRATIVE INFORMATION

ENVIRONMENTAL RESOURCE INFORMATION

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

GENERAL

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

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 Sec. 783.12; R645-301-521.

Analysis:

Plate 5-4 and other maps show the permit boundaries for the Horse Canyon Mine. The permit boundaries are divided into Permit Area A, which is the Horse Canyon project that is now being reclaimed and Permit Area B, which is the proposed Lila Canyon 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 ARCHEOLOGICAL RESOURCE INFORMATION

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

Analysis:

According to the C-2 form received with the application, Appendix 3-2 is to be replaced by information in the current submittal. Combining the information in the previous submittal with what is in this one, the application contains adequate vegetation information, but there are some parts of Appendix 3-2 from the previous submittal that should be removed. Some of the information in Appendix 3-2 of the previous submittal is important to the application and should not be replaced, but there were problems with other parts of this appendix. This review has been conducted as if the information in Appendix 3-2 of the previous submittals is still part of the application recognizing there are problems with some of this information. If this is not correct, the application would have additional deficiencies pertaining to vegetation information for the reference area and much of the proposed disturbed area, but one of the deficiencies would be removed.

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, 1999, and 2000. With the exceptions of a study by Patrick Collins in Appendix VIII-1 in the current Horse Canyon plan and 1999 and 2000 vegetation inventories 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 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 study includes a map showing the vegetation communities in relation to the proposed disturbance, but it does not show sample locations.

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

A table in the 1999 study shows woody plant densities in the proposed disturbed grass/shrub and pinyon/juniper communities and in the reference area. Densities were 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 applicant needs to give further information about the numbers in Tables 7 and 8 or delete these tables altogether.

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.

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

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

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

Findings:

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

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.

Although the C-2 form included with the January 19, 2001, submittal says Appendix 3-2 should be replaced, the Division has conducted its review as if the material in the latest submittal supplements previously-submitted information. If this is not correct, the applicant needs to supply additional vegetation information, including woody plant density information and vegetation cover information for the proposed disturbed and reference area grass/shrub communities.

FISH AND WILDLIFE RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 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, but the information on this plate is not consistent with what is shown on Plate 3-1. Not all of the symbols on Plate 5-3 are included in the legend. According to Plate 5-3, one golden eagle nest would be in the subsidence area, but it appears, based on the information on Plates 3-1 and 5-3 combined, there would be two nests in the subsidence area.

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 (*Schoenocrambe 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 grass/shrub 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 be consistent.

SOILS RESOURCE INFORMATION

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

Analysis:

Chapter 2, Soils, Sections 210 through 224, discusses the soil resources within the proposed Lila Canyon Mine. Relevant soils information is reviewed under the following headings in this Analysis:

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

Prime Farmland Investigation

A reconnaissance investigation was performed by the Natural Resources Conservation Service (NRCS) on June 8, 1998. As there is no developed irrigation system and the soils are arid, it was determined that no Prime Farmland nor farmland of statewide importance existed within the proposed Lila Canyon facilities and coal lease areas. The prime farmland determination letter 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), however portions of the Order 3 soil survey relevant to the Lila Canyon Mine project were 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

ENVIRONMENTAL RESOURCE INFORMATION

- 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 were sampled and characterized according to the State of Utah Division of Oil, Gas and Mining (DOG M) guidelines for topsoil and overburden¹. Parameters included: soil texture; pH; organic matter percent; saturation percent; electrical conductivity; CaCO₃; 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.

¹Leatherwood, 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.

- **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 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 EC values were in the "good" range, from 0.29 to 0.67 mmhos/cm.
- **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 CaCO_3 ranging between 20 to 21 percent. Pedons LC3 and LC4 have some CaCO_3 accumulation in the subsoil but is less than the 15 percent needed to be classified as a calcic horizon.
- **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. In this case, however, calcium is being removed from the soil solution by calcium carbonate precipitation. As a result, soluble magnesium exceeds soluble calcium in the lower soil horizons.
- 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 where 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 material as a source for substitute topsoil.

Findings:

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

LAND-USE RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 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 shown on Plate 4-2, and wildlife habitat is shown on Plate 3-1. Production in the grazing allotments in terms of animal unit months is shown in Table 4-3.

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.

ALLUVIAL VALLEY FLOORS

Regulatory Reference: 30 CFR Sec. 785.19; 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 Sec. 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:

The permittee has submitted sufficient information to address this section.

GEOLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 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**

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).

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 basis or less. 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 selection of parameters that were measured was based on 30 CFR 783.16: this 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 the Division 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

The proximity of the proposed Lila Canyon Significant Revision of the Horse Canyon Mine to areas that are being advocated as wilderness will subject the operator's proposal and the Division's findings to more than the usual scrutiny; Southern Utah Wilderness Association (SUWA) has targeted this project on its web-site, and as a result letters have been sent to the Division and BLM opposing this mine. There are baseline data collected at various dates for many springs in the area, and baseline data were obtained by IPA in 1994, 1995, and 1996 for the wells and springs that are proposed for operational ground-water monitoring. Additional, current baseline data for these wells and springs were to have been obtained beginning in July 2000. The Division has received one set of well measurements (data from one well and the other two wells appear to be no longer usable), but nothing for the springs. While existing baseline data are considered sufficient to approve the permit, the permittee doesn't seem to appreciate that they and the Division would find it much easier to defend the MRP - in particular the PHC and monitoring plan, the CHIA, and the issuing of a permit with additional, current baseline data.

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).

ENVIRONMENTAL RESOURCE INFORMATION

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.

A water-monitoring program was implemented in July 2000 to determine if the springs proposed for operational monitoring were still viable and to establish a current baseline that would be continuous with operational monitoring (page 30, Chapter 7): L-6-G (H-18, HC-18, EWL-25), L-7-G (9, S-9), L-8-G (10, S10), L-9-G (16, 16Z, S-16), and L-10-G (14, S14) were to have been monitored. No data for L-6-G through L-10-G have been received by UDOGM for this recent monitoring, neither with the most recent version of the plan revision nor with the quarterly reports.

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). The permittee considers S-32 unusable (Section 724.100).

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. Water quality has not been determined for these wells. A water-monitoring program was implemented in July 2000 to determine if the wells and springs proposed for operational monitoring were still viable and to establish a current baseline that would be continuous with operational monitoring (page 30, Chapter 7). In December 2000, UtahAmerican was able to measure the water level in IPA-2, but at IPA-1 and IPA-3 the probe was not able to go far enough into the wells to reach water.

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	
	JBR														
	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	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											
	EarthFax														
	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		

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	
	3					F	F	F	D	S	F	F	F		
	3A					F	F	F	D	D	F	D	D		
	3B					F	F	F	D	D	F	F	F		
	3C								D	S	S, F	F	F		
	3D								D	S	F	F	F		
	4					F	D	F	D	Flow	F		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		

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	
		1978 - 1980 (Geneva)	1981 - 1983 (Geneva)	1985 (JBR)	1989 (Kaiser)	1993 (EarthFax)		1994 (EarthFax)			1995 (EarthFax)			1997 Annual Report	(Spring Name)
Utah American Energy	JBR - EarthFax			Nov		May	Oct	May	Aug	Oct	May	Aug	Oct	quarterly	
	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)
	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

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	
															01 2620

SURFACE-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	
	HCSW-1 (HSW-1) (HC-1)		R		L	F, L	L	F, L	F, L	F, L	F, L			F, L	
	HCSW-2					D		D	D	D	D				
	HCSW-3					D		D	D	D	D				
	HCSW-4														
	B-1 (HC-2)		R		D									D	
	RF-1		R		L									F, L	
	IPA-1														
	IPA-2														
	IPA-3														

ENVIRONMENTAL RESOURCE INFORMATION

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).

There are no baseline data, not even reports stating "no-flow", for L-1-S, L-2-S, and L-3-S in Lila Canyon, nor for surface water anywhere in the Lila Canyon drainage. A water-monitoring program was implemented in July 2000: data are to be collected, when possible, at L-1-S through L-4-S (page 30, Chapter 7) to establish a current baseline and assure the sites are viable. No data for L-1-S, L-2-S, and L-3-S have been received by UDOGM for this recent monitoring, neither with the most recent version of the plan revision nor with the quarterly reports.

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 proposed amendment. Outside sources for hydrologic and geologic information are referenced many times in Chapters 6 and 7. Baseline data are in sufficient for proposed ground-water operational monitoring points. Deficiencies in baseline data for surface-water monitoring are discussed above.

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 Basic Management L.L.C. (I.P.A.) for industrial use. Other rights owned by the B.L.M. or individuals are primarily for stockwatering.

Basic Management L.L.C. 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 proposed amendment, 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 6).

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 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 Lila Canyon 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.

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 proposed amendment. Water samples from seeps, springs, and streams will be analyzed for the parameters listed in Tables 7-4 and 7-5. The parameters in Tables 7-4 and 7-5 match the operational parameters 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 proposed amendment does not include a commitment to analyze ground- and surface-water samples for baseline parameters preceding each 5-year permit renewal; however, a commitment by the permittee to do this is implied by the inclusion in Appendix VI-5 of the current Horse Canyon Mine MRP of Tables 1, 2, 3, and 4 of the Division's Guidelines for the Establishment of Surface and Ground Water Monitoring Programs for Coal Mining and Reclamation Operations - the predecessor to Tech 004. For clarity, a commitment to perform these analyses should be explicitly stated in the Lila Canyon Significant Revision. UDOGM directive Tech 004 indicates these permit-renewal baseline analyses should be done for the surface-water samples collected at either high or low flow and for the spring samples collected at low flow during that year.

The permittee's water-monitoring plan is intended to provide data to show impacts to potentially affected springs, seeps, impoundments and drainages within and adjacent to the permit area by comparison with relevant baseline data and with applicable effluent limitations. 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. A water-monitoring program was implemented in July 2000: data are to be collected, when possible, at L-6-G through L-10-G and wells IPA-1, IPA-2, and IPA-3 (page 30, Chapter 7) to establish a current baseline and assure the sites are viable.

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 described for water right 91-2521 in Table 7-2 (NE/4 Sec. 13, T. 16 S., R. 14 E.) is possibly very general (as are many descriptions of water-right locations) 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.

The MRP contains a commitment to monitor IPA 1, 2, and 3 quarterly for water levels. These wells were monitored in 1994, 1995, and 1996. In December 2000, UtahAmerican was able to measure the water level in IPA-2, but at IPA-1 and IPA-3 the probe was not able to go far enough into the wells to reach water. The permittee has not presented plans to repair, recondition, or replace these wells: the proposed ground-water monitoring plan, as written, cannot be carried out without IPA-1 and IPA-3. Baseline water levels for 1994, 1995, and 1996 have been established at three points. IPA-2 should be adequate to monitor effects of mining on the aquifer. Maps show approximately where the permittee anticipates that the mine will intercept ground water. When the interception occurs, water will begin to be pumped from the mine and the water level will start to decline. Eventually well IPA-2 will be intercepted by the mine and will no longer function. Even if they were operational, IPA-1 and IPA-3 would eventually succumb to mine operations also and provide no further water-level data.

Instead of drilling additional wells to monitor the status of the aquifer, accurate measurement of water entering the mine, of water discharged from the mine, of water pumped from one location to another within the mine, and of water consumed in mine operations would provide much more useful data as to the impact of the mine operations on the ground water.

Surface-water monitoring plan

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 for these specific points, nor for any part of the Lila Canyon drainage. No monitoring is proposed for Little Park Wash, which had no observed flow during 1998 and 1999.

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, not even reports stating "no-flow", for L-1-S, L-2-S, and L-3-S in Lila Canyon, nor for surface water anywhere in the Lila Canyon drainage. A water-monitoring program was implemented in July 2000: data are to be collected, when possible, at L-1-S through L-4-S (page 30, Chapter 7) to establish a current baseline and assure the sites are viable. No data for L-1-S, L-2-S, and L-3-S 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 discharge for the Lila Canyon operation. A copy of the UPDES permit applications for the Lila Canyon Mine is 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, -731.200, (1) A ground-water monitoring program was implemented in July 2000: in December 2000, UtahAmerican was able to measure the water level in IPA-2, but at IPA-1 and IPA-3 the probe was not able to go far enough into the wells to reach water. **(2)** The permittee has not presented plans to repair, recondition, or replace these wells: the proposed ground-water monitoring plan, as written, cannot be carried out without IPA-1 and IPA-3. **(3)** A continuing effort should be made to recover IPA-1 and IPA-2 as monitoring wells. **(4)** Instead of drilling additional wells to monitor the status of the aquifer, combining information from IPA-2, the remaining well, with accurate measuring and accounting of water entering the mine, of water pumped from one location to another for storage within the mine, of water consumed by mine operations, and especially of the volume of water discharged from the mine would provide very useful information regarding the impact of the mine operations on ground water.

R645-301-724, -731.200, A ground-water monitoring program was implemented in July 2000: L-6-G (H-18, HC-18, EWL-25), L-7-G (9, S-9), L-8-G (10, S10), L-9-G (16, 16Z, S-16), and L-10-G (14, S14) were to have been monitored to determine if these springs were still viable and to establish a current baseline that would be continuous with operational monitoring (page 30, Chapter 7). No data for L-6-G through L-10-G have been received by UDOGM for this recent monitoring, neither with the most recent version of the plan revision nor with the quarterly reports.

R645-301-724, -731.200, There are no baseline data, not even reports stating "no-flow", for L-1-S, L-2-S, and L-3-S in Lila Canyon, nor for surface water anywhere in the Lila Canyon drainage. A monitoring program was to have been implemented in

July 2000 (pages 7 and 30): no data for L-1-S, L-2-S, and L-3-S have been received by UDOGM for this recent monitoring program, neither with the most recent version of the plan revision nor with the quarterly reports.

R645-301-724, -731, The Lila Canyon Significant Revision does not include an explicit commitment to analyze ground- and surface-water samples for baseline parameters preceding each 5-year permit renewal. A commitment to do these analyses is included in Appendix VI-5 of the current Horse Canyon Mine MRP, but the commitment should be repeated in the Lila Canyon Significant Revision. UDOGM directive Tech 004 indicates these permit-renewal baseline analyses should be done for the surface-water samples collected at either high or low flow and for the spring samples collected at low flow during the year these analyses are done.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

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

Analysis:

Affected Area Boundary Maps

Plate 5-4 and other maps show the permit boundaries that are the same as the affected area boundaries for the Horse Canyon Mine. 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 as appropriate, 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 and Cultural Resource Maps

The locations of cultural and historic resources in the area are shown on Plate 4-3 and on maps in Appendix 4-1. 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 permittee shows the existing surface contours on Plate 5-1A. The contours on Plate 5-1A extend more than 100 feet from the disturbed area boundaries. The contour intervals on Plate 5-1A are 25 feet. The Division does not have a regulatory requirement for minimum contour intervals or map scale. However, the Division has found that to develop adequate reclamation plans that the maps must have contour intervals of at least 5 feet and a scale of 1 inch equal 100 feet.

In the November 29, 1999 submittal, the permittee states when the detailed engineering is completed the detailed contour maps will be included in Appendix 5-4. The Division considers 25' contour level unacceptable. Before a permit can be issued the Division must have detailed topographic maps (5' contours and 1" = 100' scale) of the undisturbed area.

Mine Workings Maps

Location and extent of the Horse Canyon Mine permit area is outlined on numerous plates in the Lila Canyon Significant Revision, including Plate 5-1. Plate 5-1 shows old or abandoned mine workings outside the Horse Canyon permit area, except the 6,080-foot exploration entry from the Horse Canyon Mine is not shown. Locations of sealed openings to the Horse Canyon Mine and other mines are not identified. Plate 5-1 shows an area west of the Horse Canyon Mine, outside the line marking the limits of old works, labeled "Book Cliffs Coal Company". The active coal fire area in the old workings north of Horse Canyon is not shown on any map or discussed in the text.

Monitoring Sampling Location Maps

Elevations and locations of test borings are on Plates 6-2, 6-3, and 6-4, except that the location of S-32 is not known and therefore not shown on any map. It can be determined from the log in Appendix 6-

1 that S-32 is in T. 17 S., R. 15 E. but the Section cannot be identified because of the poor quality of the copy. Elevations of core samples are tabulated in Tables VI-1 and VI-3. Monitoring wells IPA-1, IPA-2, and IPA 3 are shown on Plates 7-1 and 7-4.

The Lila Canyon Significant Revision (Table 7-1 and Appendices 7-1, 7-2, and 7-6) contains water-quality or -quantity data for springs and seeps 1 (S-1), 9 (S-9), 10 (S-10), 14 (S-14), 16(S-16, 16Z), H-1, H-2 (HC-2), H-3, H-4 (H-C4), H-5, H-6, H-7, H-8, H-9 (HC-9), H-10, H-11 (HC-11), H-13 (HC-13), H-14 (HC-14), H-18 (HC-18), H-19, H-20, H-21, H-22, and H-92. EarthFax also identified a number of springs and seeps that were dry or had low flows at the time of the quarterly visits and for which no water-quality analyses were done: 1A,1B, 2, 3, 3A, 3B, 3C, 3D, 4, 5, 6, 7, 8, 8A, 8B, 9R, 10A, 11, 12, 12A, 12B, 12C, 12D, 12E, 13, 13A, 13B, 13Z, 14A, 15, 15A, 15B, 15C, 16A, 16B, 16C, 17, 17A, 17B, 18, 19A, 19B, 19C, 20, and 22 (Appendix 7-1). Elevations and locations of these monitoring stations are on Plate 7-1, except locations of dry springs 8B, 15A, 17B, and 19C could neither be found on Plate 7-1 nor matched with another identified seep or spring.

Springs HC-1A, H-21A, H-21B, H-18A, and H-18B and an unidentified spring 1,000 feet southwest of HCSW-2 were previously shown on 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).

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

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

Permit Area Boundary Maps

Several maps including Plate 5-1 show the location of the permit boundaries for the Horse Canyon mine. The permit boundary has been divided into Permit Area A (the Horse Canyon project) and Permit Area B (the Lila Canyon project).

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

Subsurface Water Resource Maps

Ground water was encountered in several bore holes as well as in the Horse Canyon Mine. Water-level elevation contours are on Plate 7-1; otherwise, areal and vertical distribution of aquifers within the proposed permit or adjacent areas 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 3rd level, is described in Section 724.100 (page 14); it was approximately 5,800 feet in 1986 and the permittee states that it probably has remained at this level since operations ceased in the Horse Canyon Mine. This projected ground-water elevation appears to have been used in projecting the piezometric surface mapped on Plate 7-1. The location of the dump is described in the text and is shown on Plate 7-1.

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

Locations of streams and seeps and springs are shown on Plate 7-1. According to the permittee there are no known lakes or ponds within the permit and adjacent areas.

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

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

Vegetation Reference Area Maps

Figure 1 in the 1999 vegetation study is a map showing the vegetation communities in relation to the proposed disturbance. Although the C-2 form included with the January 19, 2001, submittal indicates

the 1999 vegetation study should be replaced, the Division has reviewed the application as if Appendix 3-2 from the previous submittal is still part of the application. If the entire appendix is being replaced, the applicant needs to supply a map showing vegetation communities and the reference area. Plate 3-2 shows vegetation communities of the proposed addition to the permit area.

Well Maps

One oil exploration hole has been drilled on the property by Forest Oil Company. The location of the hole is shown on Plate 6-2. The depth and other details of this well are not known.

Contour Maps

Contour Maps of the proposed disturbed area and mining areas are included as Plates 5-2A, 5-2B, 7-1 and 7-2. 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.

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 inadequate. If the Division were to reclaim the site, we would need base maps at a scale of not less than 1 inch equals 100 feet and 5 foot contour intervals.

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

Findings:

Information provided in the proposal appears to be adequate to meet the requirements of this section of the regulations. However, the C-2 form included with the January 19, 2001, submittal indicates the 1999 vegetation study should be replaced. The Division has reviewed the application as if Appendix 3-2 from the previous submittal is still part of the application, but if the entire appendix is being replaced, the applicant needs to supply a map showing vegetation communities and the reference area.

R645-301-521, The applicant must entitle one map The Disturbed Area Map and that map must show the disturbed area boundaries. That map will then be referenced for all disturbed area changes.

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Revised: March 8, 2001

ENVIRONMENTAL RESOURCE INFORMATION

OPERATION PLAN

MINING OPERATIONS AND FACILITIES

Regulatory Reference: 30 CFR Sec. 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. 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.

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

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

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

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

No major de-watering concerns are anticipated at this property. The workings are expected to produce some water with more water being produced as the depth of mining increases. 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 shown on Plate 5-2. Since Lila Canyon is an underground mine, no overburden or spoil will be removed. The permittee does not plan on cleaning or processing the coal beyond crushing. Any coal mine waste produced from crushing will be placed in the refuse pile shown on Plate 5-2.

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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 the areas shown on Plate 5-2.

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

Findings:

The permittee has met the minimum requirements of this section.

EXISTING STRUCTURES

Regulatory Reference: 30 CFR Sec. 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 CFR Sec. 784.17; 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.

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 feels 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 Sec. 784.18; R645-301-521, -301-526.

Analysis:

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

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

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

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Plate 5-2 shows the location of the public road, known as County Road 164, but does not show the extent of the road right-of-way. The Division needs to know the location of the right-of-way in order to determine where the fence should be placed. A right-of-way can be much wider than the road. The main concern that the Division has is the location of the pond may be in the right-of-way. If the pond is in the right-of-way then the permittee will have to modify the pond's location.

Plate 5-2 shows that the chain link fence will border the road. The chain link fence does not offer any protection from the southern edge of the pond that is located within 100 feet of the public road. The permittee needs to install the chain link fence near that part of the southern edge of the pond that is within 100 feet of the county road.

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:

R645-301-521.133 and R645-301-526.116, The permittee must show that the public will be protected from mining activities that occur within 100 feet of the public road. The permittee must show 1) that public will be protected from the southern portion of the pond that is within 100 feet of the public road, and 2) the location of the right-of-way for the road on Plate 5-2, the Division needs that information to determine if the fence and pond are in the proper locations.

AIR POLLUTION CONTROL PLAN

Regulatory Reference: 30 CFR Sec. 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 permittee was requesting approval for a throughput of up to 2,000,000 tons per year, but the Approval Order says up to 1,500,000 tons of coal could be mined in a rolling twelve month period. Section 523 of the application indicates production should be between 1,000,000 and 1,500,000 tons per year for the first five years but that production could peak at 4,500,000 tons. Therefore, the application is consistent with the Air Quality Approval Order for the first five years. Any increase in production after five years would require amendments to both the Air Quality Approval Order and the 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 Sec. 817.59; R645-301-522.

Analysis:

R645-301-522 requires the permittee to give a description of the measures to be used to maximize the use and conservation of the coal reserves. The extraction ratio and the supporting calculations must be included in the coal recovery plan. Without that information the Division is unable to determine if coal recovery plan is adequate.

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:

R645-301-522 and R645-301-525.240, The permittee must give the Division a detailed coal recovery plan. That plan must include the coal extraction ratios and the calculations for the longwall areas, full extraction room-and-pillar areas and first mining only areas. A copy of the R2P2 or a mine plan approval letter from the BLM would help the Division make a finding about coal recovery.

R645-301-122, The permittee must supply the Division with a copy of the R2P2 since they reference the document in the coal recovery and subsidence section of the permit. The Division will store the R2P2 in the confidential file upon request.

SUBSIDENCE CONTROL PLAN

Regulatory Reference: 30 CFR Sec. 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.

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

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

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

Subsidence Control Plan

Coal will be removed by room-and-pillar methods. If the demand for coal increases, then longwall methods may be used. Details of the mining plan are given in Section 522 and 523. Plate 5-5 shows the mine layout and the sequence and timing of mining.

- On Plate 5-5 the permittee shows the proposed underground workings and the areas of potential subsidence. Plate 5-5 shows those areas where subsidence control methods (first mining only) will be used to protect escarpments. The permittee shows the location of the seeps, springs, and eagle nests on Plate 5-3.
- R645-301-525.440 requires that the permittee describe the subsidence monitoring plan. The permittee commits to the following:

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

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

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

The wording about when the subsidence monitoring program will cease is confusing. The permittee must clearly state that at a minimum subsidence monitoring will continue for a minimum of 5 years after mining ceases. If at the end of the 5 year period the annual subsidence in any of the 3 prior years measures more than 10% highest annual subsidence amount subsidence monitoring will continue until there are 3 consecutive years where the annual subsidence amount is less than 10% of the highest annual subsidence amount

- The permittee state that the escarpments will be protected from subsidence by allowing first mining only within 200 ft. of the outcrops. 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:

May include tension cracks, fissures, or sinkholes and ground lowering.

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

- 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 remediate any damage to water rights.

Performance Standards for Subsidence Control

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

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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:

R645-301-525.440 and R645-301-121.200, The permittee must clearly state how long the subsidence monitoring program will last and under what circumstances the program will be terminated. The subsidence monitoring program must last a minimum of 5 years. Before the subsidence monitoring program is terminated there must be a minimum of 3 consecutive years where the annual subsidence is less than 10% of the highest annual subsidence.

SLIDES AND OTHER DAMAGE

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

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 PLAN

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 satisfactory. The water rights listed in Table 7-2 indicate the uses are for "mining" and "other." Ensuring that water quality is suitable should be possible through testing required for the discharge permit.

The application discusses the possible benefits of water in the sediment pond to wildlife. 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. Bighorns would presumably be among the wildlife that would benefit from guzzlers. According to the application, the applicant has agreed to install two guzzlers. Designs are available for guzzlers that blend into the surrounding area extremely well and require almost no maintenance.

The 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

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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, it appears there are two nests within the subsidence area shown on Plate 5-3. These nests are shown on Plate 3-1 as #820 and 946 (one nest) and #719. The Division assumes these nests could actually be lost, not just not used.

The Division consulted with the Fish and Wildlife Service and the Division of Wildlife Resources about the potential loss of nests in the area, and it was agreed the applicant should commit to providing alternative nest sites if a nest is lost as a result of subsidence. In Section 322.220, the application says that if a nest is lost through subsidence, the applicant will work with the Fish and Wildlife Service and the Division of Wildlife Resources to analyze the potential and construction of alternative nest sites. This commitment is considered to be adequate.

It is possible the nests that will be undermined could be used in spite of their proximity to the mine. For this reason, it will be necessary to monitor the sites near the time when they would be undermined. It might be necessary to preclude birds from using the nests 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.

Findings:

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

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 salvage and stockpiling and subsoil salvage and protection are reviewed under the following headings in this Analysis:

- Topsoil and Subsoil Removal

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- Topsoil Substitutes and Supplements
- Topsoil Storage

Topsoil and Subsoil Removal

Available Soil Resources

The 1998 Order 1 soil survey, Appendix 2-3, identifies 157,600 cubic yards of available soil for salvage from the 48 acre disturbance (average salvage depth is 24 inches). This estimate is based on the entire disturbance area, however Plate 2-3, Soil Salvage and Replacement, shows an undisturbed island within the disturbed area boundary. Therefore, 157,600 cubic yards is an over estimation of available topsoil.

Section 232.100, Available Soil Resources Table, identifies a **potential soil salvage** volume of 148,630 cubic yards from a 40.77 acre disturbance area (average salvage depth of 25.4 inches). Table 2 of this technical analysis summarizes the potential soil salvage volumes as presented in the Available Soil Resources table in Section 232.100 of the application. The Available Soil Resources table in Section 232.100 shows **actual topsoil salvage** as 49,440 cubic yards from 23.61 acres for an average salvage depth of 15.6 inches (summarized in Table 4 below).

Table 2. Potential Soil Salvage Volumes.

Potential Soil Salvage Volumes			
Soil Map Unit	Potential Salvage (inches)	Acres	Volume (yd³)
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

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, "topsoil" will imply both the A and B horizons that contain fine to very fine roots. Soil salvage depth, rooting depth and subsurface rock content are compared in Table 3 of this technical analysis

Table 3. Percentage of Rocks and Depth of Fine Roots in the Potential Soil Salvage Layers

Map Unit	Salvageable Soil Layer (inches)	Depth of Fine Roots* (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

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

Topsoil Salvage Practices

State regulations are specific in requiring that all topsoil be removed from the area to be disturbed (R645-301-232.100). Since the A horizon is less than six inches deep, the Mining and Reclamation Plan (MRP) 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 MRP 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 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.

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Table 4. Actual Soil Salvage Volumes

Actual Soil Salvage Areas	Soil Depth (inches)	Acres	Soil Volume (yd ³)
Topsoil* SBG	18	11.10	26,873
Topsoil* VBJ	18	3.95	9,551
Topsoil* XBS	12	3.94	6,420
Topsoil* DSH	18	1.36	3,291
Topsoil* RBL	8	2.38	2,596
Topsoil* RBT	6	0.88	709
Total		23.43	49,440

* 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." i.e. Plate 2-3, Soil Salvage and Replacement, shows three undisturbed islands within the disturbed area boundary. Soil will be salvaged from localized areas within these undisturbed islands as follows:

- **Topsoil Pile Access.** Plate 2-3 shows an access road to the topsoil. Soil on this road needs to be salvaged before construction.
- **Topsoil Pile Storage Area.** Plate 2-3 shows a rectangular topsoil storage area. The Division recommends scraping the top 18 inches of soil from the VBJ soils in this area and using the topsoil to form berms around the perimeter of the topsoil storage yard. This initial clearing of topsoil from the interior of the topsoil storage yard will allow free

equipment access throughout the area. At reclamation time, the compacted subsoils can be ripped and the bermed topsoil replaced.

The Disturbed area boundary must include topsoil storage area, but need not include the disturbed area shown on Plate 7-1 as DA-1. In fact, Plate 7-2 shows drainage control structures (DD-1) on the south side of the disturbed area (DA-1), yet the application presents no plans to salvage soil from this area (Plate 2-3). The disturbed drainage ditch (DD-3) should handle the disturbed area drainage and it would seem that construction of DD-1 is needless disturbance. The Utah regulatory program specifies that measures should be taken to disturb the smallest practicable area of disturbance (R645-301-331). Therefore, the Division would like to see DD-1 removed from the Mining and Reclamation Plan.

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. Subsoils have increased carbonates and large percentages of rocks (> 70%). Within the RBL and RBT soil areas, Mancos Shale is encountered within 6 - 8 inches. In no case will the Mancos Shale be salvaged with the overlying soils (Section 232.300). 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 (Section 232.100, page 12).

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, studies of plant phenology have clearly shown that plants in arid areas use soil water from increasing depths as the growing season continues, and if there is inadequate rooting depth, production and vegetative cover will decrease.² A good indication of the depth of soil needed is the rooting depth of the plants currently growing on the site, as reported in the Order I soil survey (see Table 3 above).

The MRP states that subsoil deeper than 18 inches from Soil Map Units SBG, DSH, and VBJ will not be salvaged and will remain for use as construction fill during grading activities. Although these subsoils will be used as fill, they will be needed during reclamation to reestablish rooting depth potential. Therefore, contamination of the subsoil with shale will not be permitted (Section 232.100, page 12). Furthermore, a certified soil specialist will be on site during any pad construction and reclamation.

Plate 2-4 shows the locations of cuts and placement of subsoil fills during construction of the operations. The reverse operation will occur during reclamation (Section 242.100): where upon the identified subsoil will be replaced in its approximate original location. The volume of these subsoils should be included in the application.

Plates 5-7A through 5-7C are cross sections of the existing, operational, and reclamation topography. Using these plates, the Division has cross checked the cut and fill areas shown on Plate 2-4.

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

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It seems that at Station 10+00, the cross sections do not agree: Plate 2-4 shows a fill where Plate 5-7A-3 shows a cut at reclamation. The vertical scale on plates 5-7A through 5-7C is 1" = 50', this scale is not sufficient to use the cross sections as checks against all of cut and fill areas shown on the Soils Transfer Map, Plate 2-4. (Some of the soils are being cut 23 inches deep and some are cut 99 inches deep. Some are being placed 53 inches deep and some are being placed 1" deep.?) Detailed cross sectional maps of a larger scale would be appropriate to show the subsoil cut and storage areas.

Without such detailed cross-sections, the best way to ensure subsoil recovery from Soil Map Units SBJ, DSH, and VBJ is through the use of pedestals during pad development (for comparison with the salvageable Soils Map Appendix A-2) followed by an as-built map which shows locations of the soils as they are stored in the pad. Commitments to use pedestals for verification of subsoil removal depth and to create an As-Built are needed in the Mining and Reclamation Plan.

During operations, protection of subsoil is addressed in Section 232.500: "Subsoils being used as pad material will be protected by a surface of asphalt, concrete or gravel. Those areas covered by gravel will have an impervious membrane placed between subsoil and gravel."

Adverse Conditions

Section 232.710 says soil will not be removed from the area between the rock slope and the ROM stockpile due to rockiness and steep slopes. For the same reasons, disturbance will be minimal in this location, with only two bents planned to hold the conveyor.

Measures to protect the unsalvaged, undisturbed soil will include:

- Jersey barriers along the perimeter of the ROM stockpile to prevent encroachment of coal onto the undisturbed ground (Section 232.710).
- Quarterly inspections of the undisturbed area (Section 234.220).
- Periodic cleaning of the undisturbed area soil, if the accumulation of coal fines exceeds one inch (Section 232.710 and 234.200).
- A covered conveyor and an enclosed crusher (Plate 5-8). (Plate 5-8 shows and incorrect North arrow direction.)

Wind blown coal fines and coal spills will inevitably adversely affect the soil. Additional measures could include establishment structures similar to snow fences. What direction is the prevailing wind?

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 (coal mine waste) that must be disposed of in a refuse pile. In

addition to the rock slope material, coal processing waste and other underground development waste will be disposed of in the refuse pile. Appendix 5-7 indicates that 25,000 CY of refuse will be generated. This refuse will be examined and tested as necessary (page 82 Section 536.) More detail is required to inform the Division of what testing will occur and with what frequency. This detail might extend to any refuse encountered over the life of the mine.

Plates 5-2 and 7-5 show rock storage areas north of the slope, rock and refuse storage area. As discussed in Section 232.100 (page 12) of the application, boulders may be stockpiled in these locations. These sites are not coal refuse disposal areas.

Figure 1 Appendix 5-7 differentiates between structural fill (rock slope waste) and refuse. The area designated for refuse is approximately two acres (300' x 300') and can hold 19,500 cubic yards.

The MRP plans for four feet of cover over the refuse pile (section 232.500 and Appendix 5-7). 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 four foot hole created from the subsoil removal (Section 232.500 and Appendix 5-7). 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 2, Appendix 5-7. From this figure, one can see that refuse placement will actually exceed the excavation to create surface which is level over the entire structural fill area. Although the excavation is only 4' deep, refuse will be placed 15 to 19 feet deep. Figure 2, Appendix 5-7 appears to show an abrupt end to the rock slope and refuse pile storage area. The rock slope/refuse pile should blend into the surrounding terrain. The Division would like to see a profile of the length of the rock slope/refuse pile.

The part of the disposal site reserved for coal mine waste as shown on Figure 1, Appendix 5-7 is in the DSH soil mapping unit. The Available Soil Resources table in Section 232.100 indicates the potential salvage depth in this unit is 40 inches. According to the plan for the refuse 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. Below 48 inches, however, there are serious restrictions due to high rock contents and salt levels. The Division wants to ensure that the subsoil below 48 inches from the DSH soil mapping unit is not utilized during reclamation for plant growth medium. For this reason, a commitment in the Mining and Reclamation Plan is requested to provide pedestals during construction to verify soil removal depths.

Topsoil Storage

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

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

An approximate location is given for the topsoil to be salvaged from fan portal disturbance along with the fan topsoil pile configuration on Figure 1 Appendix 5-7. How will the soil be salvaged from the fan site?

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, Salvage soil from all areas that would be disturbed by coal mining and reclamation activities including the access road to the topsoil pile and around the topsoil pile location.

R645-301-521.162 and R645-301-232.100 Clearly identify the proposed disturbed area on all maps and salvage topsoil from areas designated to be disturbed. i.e. compare DA-1 and DA-9 shown on Plate 7-2 with the same areas on Plate 2-3.

R645-301-231.100 and R645-232.500 Use pedestals or other survey method to verify subsoil salvage depth according to Salvageable Soils Map Appendix A-2 and provide an As-Built map showing the location and volume of the subsoil stored in the pad for use as additional rooting media.

R645-301-234.100 Outline how soil from the fan site will be salvaged.

R645-301-553.252 Provide information on the details of testing of rock slope waste and other refuse: at what frequency will the gob be sampled? And what parameters will be analyzed?

R645-301-331 Remove ditch DD-1 from the Mining and Reclamation plan in an effort to disturb the smallest practicable area.

R645-301-536 a) Adjust Figure 2, Appendix 5-7 cross sections to show that the rock slope/refuse pile blends into the surrounding terrain; and, b) Add a cross section showing the profile of the rock slope/refuse pile.

R645-301-512.120 Verify the direction of the North Arrow on Plate 5-8.

INTERIM REVEGETATION

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.

SLIDES AND OTHER DAMAGE

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

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.

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 Systems***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 STABLE to do the stability analysis and the Division's Price Field Office. The road embankment and cut-slope meet the minimum safety factor requirement of 1.3.

- 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 to insure that the roads meet the performance standards.

Primary Road Certification

The road plans and cross sections in Appendix 5-5 and Plate 5-2 were certified by a register 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:

Disposal of Noncoal Waste

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 debris will be at the ECDC facility near East Carbon City. Plate 5-6 show that the concrete will be disposed of in the coal storage area.

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 shows where the concrete will be disposed on Plate 5-6.

Coal Mine Waste

The permittee states in Section 528.320 that coal mine waste will be placed in new disposal areas within the permit area. The permittee will divide the refuse pile into two sections. The first section will contain rock removed from the access tunnels. The rock will be used as structural fill for the shop/warehouse. The second section will be used for coal mine processing waste and underground development waste that contains coal. The location of the refuse pile is shown on Plate 5-2 and in Appendix 5-7.

R645-301-536.100 requires that refuse piles be designed using current prudent engineering practices. In Appendix 5-7 the permittee describes the placement of refuse as follows:

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Refuse will be dumped into the hole created from the removal of the subsoil. The refuse will be placed in the hole as per Figure 1. Once the hole is filled to the level shown in Figure 1 the subsoil will then be placed over the top of the refuse and another hole will be constructed by removing subsoil adjacent to the previous hole. The topsoil removal and storage, subsoil removal, the hole being filled with refuse, and subsoil replacement, procedure will be repeated as additional refuse disposal area is needed.

Limited compaction will take place during the filling operation. Upon final reclamation the topsoil will be redistributed over the refuse storage area and reclaimed as per Chapter 3. The total cover over the refuse area when considering the subsoil and topsoil will be a minimum of 4'.

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 coal mine waste disposal facility has a static safety factor of 16.19. The calculations were made at cross section 8+00.

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, construction, operation, and Appendix 5-5, slope stability. No springs, water courses or wet weather seeps exist in the refuse piles area. The applicant 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 in Appendix 5-3. The plan is adequate.

Return of Coal Processing Waste to Abandoned Underground Workings

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

Excess Spoil

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

Findings:

The permittee met the minimum requirements of this section.

HYDROLOGIC INFORMATION

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

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

Surface-water monitoring will be conducted according to the water monitoring plan in Section

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731.220 of the Lila Canyon Significant Revision. Operational 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. They will be monitored monthly for parameters listed in Table 7-4, which are the same parameters as listed in Table 3 of UDOGM directive Tech 004. No monitoring is proposed for Little Park Wash, although it appears to be a major surface drainage in the permit area, because no flow was observed during quarterly inspections during 1998 and 1999.

Point-source discharge monitoring, sediment pond discharge at L-4-S, and the potential mine discharge at point L-5-G 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 the Division of Environmental Health for the proposed sediment pond and mine water for the Lila Canyon operation. A copy of the UPDES permit application is provided in Appendix 7-5.

Streams will be monitored monthly. Sediment pond and mine discharges will be monitored monthly or as frequently as discharges occur (Table 7-3).

Monitoring reports will be submitted to the Division at least every three months, within 30 days following the end of each quarter (Section 731.220). When analysis of any surface water sample indicates noncompliance 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 are in imminent danger due to the noncompliance (Section 731.223).

Surface-water monitoring will continue through mining and reclamation until bond release (Section 731.224). Operational ground- and surface-water monitoring will be implemented upon approval of the plan (Section 731.200).

The permittee commits in Section 731.225 that equipment, structures and other devices used in conjunction with monitoring the quality of surface water on-site and off-site will be properly installed, maintained and operated and will be removed by the operator and will be removed by the operator when no longer needed.

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).

There was some discussion with Kerry Flood, to the Bureau of Land Management, to develop water monitoring plan for Range Creek, a perennial stream north-west of the mine, to assess any potential impacts from mining to the perennial stream. No monitoring plan has been proposed. It was determined later 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 mines 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

The permittee proposes in Section 731.121 that surface-water quality protection is to be accomplished by the plan described in Section 731 and the following methods:

- Minimizing surface disturbance and proper handling of earth materials to minimize acidic, toxic or other harmful infiltration to ground-water systems;
- Testing (as-necessary) to ensure stockpiled materials are non-acid and non-toxic;
- Controlling and treating disturbed area runoff to prevent discharge of pollutants into surface-water, by the use of diversions, culverts, silt fences, sediment ponds, and by chemical treatment if necessary;
- Minimizing and/or treating mine water discharge to comply with UPDES discharge standards;
- Establishing where surface-water resources exist within or adjacent to the permit area through a baseline study and monitoring quality and quantity of significant sources through implementation of a Water Monitoring Plan;
- Proper handling of potentially harmful materials (such as fuels, grease, oil, etc.) in accordance with an approved Spill Prevention Control and Countermeasure Plan (SPCC).

Underground development waste will 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 (Section 731.312).

All storage, burial and treatment practices will be as described in this permit and consistent with applicable material handling and disposal provisions of the R645-Rules (Section 731.320).

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 from underground mines.

The proposed access portals are below the coal outcrop, as shown on Plates 5-2 and 7-5. The fan is to be located above the outcrop. The two 1,227 foot access tunnels will slope up at approximately 12%,

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from a starting elevation at the surface of approximately 6150'. The intersection of the coal seam and the rock slope will take place at approximately 6,300 feet elevation. Maximum ground-water elevation measured in the three IPA wells was 5,972 feet, and maximum projected elevation in the vicinity of the rock-slope tunnels is approximately 6,000 feet (Plate 7-1), so the likelihood that the rock slopes will intercept ground water in the regional aquifer is possible.

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

Presently, the operator plans to use the water that is intercepted during mining operations. The operator has submitted an application to the Utah Division of Water Quality for a UPDES mine water discharge permit in the event water production is greater than can be used in the mine. The operator has identified the mine water monitoring site as L-5-G. Before mine water is discharged the permittee has stated that receiving channels will be studied before and during discharge to analyze any changes or adverse impacts.

Numbers provided in the Lila Canyon Significant Revision (Figure 7-1) indicate ground-water levels would need to rise approximately 150 feet just to reach the starting elevation of the tunnels at the base of the Book Cliffs (6,150 feet) and approximately 300 feet to reach the intersection of the tunnels with the coal seam (6,300 feet). Mining will proceed downdip, to the east, from that intersection. Based on water monitoring results and historical information, it is unlikely water levels will ever reach the intersection of the tunnel and coal seam, and gravity discharge from the surface entries of the mine is also possible.

The operator has not identified which channel will be receiving any excess mine water production or identified the method of transport from the discharge site to the channel.

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.

A copy of the UPDES permit application is in Appendix 7-5.

Casing and Sealing of Wells

There are no wells planned for the Lila Canyon Mine; however, if any wells are installed in the future, they will be permanently sealed in accordance with Section 765 of the Coal Mining Rules (Section 765).

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 7-6) 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 culverts UC-1 and UC-2 will be placed 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 area identified as DA-1 on Plate 7-2 is identified as undisturbed Plate 5-2. If the area (DA-1) is undisturbed does it need a diversion ditch (DD-1)?

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.

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). Both culverts will be constructed of 60 inches (diameter) corrugated metal pipe (CMP).

Calculations indicate that the 100 year-6 hour precipitation event would produce a flow of about 51.6 cubic feet per second (cfs) down the channel. A 60 inch culvert with a headwall of one depth in diameter, H/D 1 will pass a flow of about 95 cfs. A culvert of 36 inch diameter could have been used to pass the calculated runoff, however, late summer thunderstorms wash sediment and debris down the channels, and the larger 60 inch culvert was picked by Utah Division of Water Rights, (Stream Alteration Permit Program) and DOGM to ensure extra safety. The larger culvert should pass debris and extra large flows to protect the culvert and sedimentation pond built above the culvert. Culvert UC-1 will also be a 60 inch in diameter.

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The upstream embankment of culverts UC-1 and UC-2 will be protected by riprap. The permittee has submitted Figure 4, which illustrates a typical view of the trashrack and headwall structure for the undisturbed culverts.

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 is planned to be the use of rip-rap; however, other methods such as straw dikes, check dams and/or vegetative filters may be employed during the operational or reclamation phases as determined necessary, and with 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

The principle spillway is a corrugated metal pipe culvert which opens to the undisturbed channel culvert. The emergency spillway was originally proposed to be constructed of grouted rip-rap crossing the access road embankment. The most recent plans call for the emergency spillway will be constructed as 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-6, not UC-2

The emergency spillway discharges into the 60 inch undisturbed culvert 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). Although, Sections 743.130-744.100 still refers to the older plans which state that a open channel spillway will be used, Volume 6, page 73.

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

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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 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.

Findings:

R645-301-731 The operator should describe how undisturbed drainage above the disturbed areas DA-1 and DA-2, shown on Plates 7-2 and 7-5, will be diverted or controlled.

R645-301-731 The operator should describe the need for the disturbed drainage ditch, DD-1 which captures undisturbed drainage, to route disturbed area drainage away from the disturbed area. The area identified as DA-1 on Plate 7-2 is identified as undisturbed Plate 5-2. If the area (DA-1) is undisturbed does it need a diversion ditch (DD-1)?

R645-301-731 The operator should identified which channel will be receiving any excess mine water production and identified the method of transport from the discharge site to the channel.

R645-301-731 Map 7-6 needs to be corrected to show the main stream channel connecting to culvert UC-2.

R6454-301-742 The applicant need to submit detailed plans of sediment control measures for the fan area.

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 has 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 has met the 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.

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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 Plate 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 Map
Plate 5-5	Mine Workings Map
Plate 7-1	Permit Area Hydrology Map
Plate 7-2	Disturbed Area Hydrology/Watershed
Plate 7-3	Water Rights Locations
Plate 7-4	Water Monitoring Location Map
Plate 7-5	Proposed Sediment Control Map
Plate 7-6	Proposed Sediment Pond
Plate 7-7	Post-Mining Hydrology

Mine Workings Maps

The Mine working map is located on Plate 5-5. The map contains a legend that details site information. The map also identifies the mining sequence.

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.

Certification Requirements

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

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, The disturbed area boundaries shown on Plate 5-2 and other maps must be show the areas where the permittee will or is likely to cause surface disturbance. The permittee needs to include the following areas into the disturbed area 1) there must be access to the sediment pond, the permittee does not have access to the pond on the west side because of the chain link fence and the land on the south, east and north side is all undisturbed, 2) the disturbed area boundary must include culvert UC-1 and all of culvert UC-2, 3) ditches DD-1 and DD-12 must be included in the disturbed area, when Plate 7-5 and Plate 5-2 are overlaid those ditches are shown to be outside the disturbed area boundary.

R645-301-512.100 The operator should identify on a Plate 7-5, how any mine water discharge would be transported from the portal to the stream channel.

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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:

The definitions of Approximate Original Contour (AOC) contained in SMCRA and the Utah coal rules are primarily statements of the objectives of post-mining backfilling and grading so that the area "closely resembles the general surface configuration of the land prior to mining" and "blends into and complements the drainage pattern of the surrounding terrain". At the same time, reclamation performance

standards must be met, including controlling erosion, establishing mass stability and establishing permanent, diverse and effective vegetative cover. In some circumstances, replicating the original contour may only be possible at the expense of one or more reclamation performance standards. In others, it may be possible to achieve nearly exact original contour and simultaneously satisfy all the other regulatory requirements. Although the principles of regulatory construction suggest that specific regulatory requirements take precedence over general provisions, this directive is intended to reconcile the specific performance standard requirements of the regulatory program with the general definitions of AOC in a way that accomplishes the objectives of SMCRA.

The underlying objectives of the AOC requirements relate to the assumption that post-mining features which mimic pre-mining features are most likely to quickly achieve mass and erosional stability, revegetation, hydrologic balance and productive post-mining land use, all of which are the objectives of the reclamation performance standards. AOC also addresses aesthetic considerations. In order to evaluate methods for achieving AOC, the underlying objectives and challenges of reclamation at the site in question must first be identified. In some circumstances, one objective of challenge of reclamation may be more significant than another. The methods for achieving AOC should reflect the relative significance of each objective and the interplay between each objective and the objectives of AOC in that circumstance.

The AOC land surface features are as follows:

Final Surface Configuration: The main question that is used to determine if the site meets this requirement is "Does the postmining topography, excluding elevation, closely resemble its premining configuration?" The Division does not have standards for evaluating this standard. The Division does rely on the judgement of the technical staff that reviews the reclamation plan. The staff reviewed the premining and post mining topographic maps and cross section and determined that this condition is met.

All Spoil Piles to be Eliminated: No spoil piles are associated with this site.

All Highwalls to be Eliminated: The permittee states in Section 553.120 the following:

Minor highwalls may be created with the development of the rock slope portals. Upon completion of mining these entries will be seal as per Closure for Mine Openings Appendix 5-6 and highwalls will be eliminated during reclamation phase of the operation. During reclamation, suitable materials will be placed against the portals. This material will be shaped to eliminate or minimize the highwall and to bring the slope back to the approximate original contour.

Since Appendix 5-6 was not included in the submittal the Division cannot review that material. The permittee must reword Section 553.120. Since the portals will be located in a Post-SMCRA area all highwalls must be completely eliminated not just minimized. See R645-301-553.120.

Hydrology: The main concerns with hydrology are that the drainages are restored and that sediment is controlled. The Division considers those conditions to be met when the hydrologic reclamation

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requirements are met.

Post-Mining Land Use: The Division considers the post-mining land use requirement for AOC to be met when the general post-mining land use requirements are met.

Variance from AOC: The permittee did not request a variance from AOC.

General Backfilling and Grading: The Division will discuss the general backfilling and grading requirements in the Backfilling and Grading section of this TA.

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:

R645-301-553.120, The permittee must change the wording in Section 553.120 to show that all highwalls will be eliminated. Since the site is Post-SMCRA no highwall or highwall remnants can be left.

R645-301-553.120, The permittee must include Appendix 5-6 so that the Division can review the highwall elimination plan. Appendix 5-6 must have cross section for each portal so that the Division can determine if that will be properly reclaimed.

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:

The general backfilling and grading requirements are as follows:

Achieve AOC: The AOC issues are discussed in the AOC section of this TA.

Elimination of Highwalls, Spoil piles and Depressions: Highwall elimination is discussed in the AOC section of this TA. No spoil piles will be associated with the site. No depressions are shown on Plate 5-6, Post Mining Topography.

Slope stability: The reclaimed slopes are shown to have slopes less than 1.5H to 1V, which is the approximate angle of draw and the slope stability analysis in Appendix 5-5 show that the reclaimed slopes will meet or exceed a 1.3 safety factor.

Minimize Erosion and Water Pollution: The Division considers these requirements to be met when the hydraulic reclamation requirements are met. Those requirements are discussed in other section of the TA.

Post-Mining Land Use: The Division considers the post-mining land use requirement to be met when the general reclamation post-mining land use requirements are met.

Disposal of Coal Mine Waste: All coal mine waste will be disposed in approved refuse piles, which are discussed in the Refuse Pile section of the TA.

Exposed Coal Seams and Acid- and Toxic-Forming Materials and Combustible Materials: The permittee has committed to cover all such materials with 4 feet of fill materials.

Findings:

The permittee met the minimum requirements of this section.

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 has 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.

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Analysis:

Chapter 2, Soils, Sections 240 through 244, discusses the soils reclamation plan for the proposed Lila Canyon Mine. The following topics are discussed in this Analysis:

- 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.

In Section 232.500, the application says subsoil ranging in thickness from 12 to 30 inches from cutslope sites will be used as fill material for site development and replaced in an approximate original sequence during reclamation. Subsoil from Soil Map Units SBJ, DSH, and VBJ used as construction fill need to be identified and used appropriately during reclamation as root zone subsoils, as previously discussed.

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 (Section 241, page 19). 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.
- Replace boulders.
- Gouge the topsoil.

Soil replacement volumes are shown below 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.

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.

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.

Soil Nutrients and Amendments

Section 241 states that an inoculum will be applied to the soil to help assist in reactivating and regenerating soil organisms. The seed mixture will be either hand broadcast over the area and raked into

the soil surface, or sprayed on the surface using 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.

Section 231.300 and Section 243 state that topsoil will be sampled and tested prior to replacement to determine what nutrients are necessary at reclamation time. Grab samples will be collected from the stockpile at various locations and depths. Fertilizer, if needed, will be applied to the topsoil prior to seeding and mulching activities. Sampling will either be performed by a Certified Soil Scientist, or by a person considered to be qualified by the 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 are pocking and rock placement. In addition, wood fiber mulch will be applied at a rate of 2,000 pounds per acre to the reclaimed areas that have been graded and covered by topsoil or substitute topsoil. The wood fiber mulch will be tacked to the surface with a tackifier.

Section 244.200 states that pocking will be the primary method used to roughen the soil surface as per Figure 1 in Appendix 5-8.

Findings:

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, Specify the depth of ripping and provide detail of the sequence of ripping and subsoil placement. i.e. ripping comes after grading, but before subsoil rooting medium placement.

R645-301-241 and R645-301-234.300 through R645-301-234.320, Identify areas where subsoil from Soil Map Units SBJ, DSH, and VBJ was used as construction fills. Replace subsoil "construction fill" during reclamation as root zone subsoils. () Identify pad and mine areas containing subsoil "construction fills" that will be graded to AOC. (2) Identify methods to ensure that subsoil "construction fills" are used appropriately as root zone soils.

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

There is no specific reclamation ground-water monitoring plan. Ground-water monitoring, if implemented, 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

The slope-rock material will be examined and tested as necessary to determine acid- and toxic-forming potential (Section 536). It has not been established that the underground development waste that will come from construction of the tunnels can be properly disposed of at a refuse pile and that reclamation of a refuse pile can be accomplished. 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).

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Transfer of Wells

There are no wells planned for the Lila Canyon Significant Revision; however, if any wells are installed in the future, they will be permanently sealed in accordance with Section 765 of the Coal Mining Rules (Section 765).

Discharges Into an Underground Mine

No discharges planned to underground mines.

Gravity Discharges

Based on water monitoring results and historical information, it is unlikely water levels will ever reach the intersection of the tunnel and coal seam, and therefore gravity discharge from the surface entries of the mine is also unlikely.

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

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

The operator has not identified which channel will be receiving any excess mine water production or identified the method of transport from the discharge site to the channel.

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.

Sediment control measures have not been prescribed for the area around the fan area.

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

There are no new wells planned for the Lila Canyon Significant Revision; however, if any wells are installed in the future, they will be permanently sealed in accordance with Section 765 of the Coal Mining Rules (Section 765).

RECLAMATION PLAN

Findings:

R645-301-731 The permittee should identify which drainage will receive mine water discharge in the event excessive mine water volumes are encountered beyond what is usable in the mine.

R645-301-742 The applicant needs to identify sediment control or treatment measures for the fan area.

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 found it difficult to establish these species on reclaimed sites, and this may be because they are often seeded in the fall. Mines in New Mexico and Arizona usually seed these species in the summer to take advantage of late summer rains, but, to the Division's knowledge, no Utah mines have attempted to establish these species by planting them in the summer.

The 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 16-18 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. Diagrams of pock mark configurations are shown in Figure 1 in Appendix 5-8.

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

The 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. 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. 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 will be broadcast with a hydroseeder. Fertilizer will be broadcast, but the application does not give a specific application method. Fertilizer should not be included with seed during hydroseeding operations. The site will be mulched with 2000 pounds per acre of wood fiber mulch with 100 pounds per acre of a tackifier. Appendix (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. While Appendix 5-8 presents detail not included in Chapter 3, the Division considers the plans 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 reseeded and other work for specific purposes without lengthening the extended liability period.

Success Standards

The reference area for the mine site disturbance was established adjacent to the proposed facilities during the summer of 1999. Its location is shown on Figure 1 in Appendix 3-2.

The grass/shrub reference area is similar in most respects to the proposed disturbed grass/shrub areas, and it is considered an acceptable success standard. 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. The pinyon/juniper area has statistically less vegetation cover than the reference area, so this may be a difficult standard to meet. However, reclaiming to a grass/shrub community would enhance the amount of forage available for both wildlife and grazing. A pinyon/juniper community would generally provide more cover for some wildlife species, but forage tends to be more limiting in this area than cover. Therefore, the Division considers this proposal to be acceptable.

The Division is required in R645-301-356.230 to consult with the 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.

RECLAMATION PLAN

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:

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

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 there is temporary cessation that will last more than 30 days the permittee will notify the Division. After permanent cessation the permittee committed to remove all equipment and surface structures.

Findings:

The permittee met the minimum requirements 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. Plate 5-6 needs to show the center lines of the cross section.

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

There are no specific reclamation ground-water or surface-water monitoring plans. Ground-water and surface-water monitoring will continue through mining and reclamation until bond release (Sections 731.214 and 731.224).

Reclamation Surface and Subsurface Manmade Features Maps

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

Certification Requirements

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

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 cross section must also show highwall elimination.

BONDING AND INSURANCE REQUIREMENTS

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

Analysis:

Form of Bond (Reclamation Agreement)

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

Determination of Bond Amount

The permittee states that a detailed cost break down is included in Chapter 8, Appendix 8-1. The January 19, 2001 submittal did not include Chapter 8 or Appendix 8-1.

Terms and Conditions for Liability Insurance

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

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:

R645-301-830.140, The permittee must give the Division detailed reclamation cost estimates based on the OSM reclamation bond calculation handbook. The permittee states that the reclamation cost estimates are in Chapter 8, Appendix 8-1. However, the January 19, 2001 submittal did not include Chapter 8 or Appendix 8-1.

REQUIREMENTS FOR PERMITS FOR SPECIAL CATEGORIES OF MINING

PRIME FARMLAND

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

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

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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