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

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February 23, 2000

R. Jay Marshall, P.E., Resident Agent
UtahAmerican Energy, Inc.
P. O. Box 986
Price, Utah 84501

Re: 3rd Technical Review of Lila Canyon Revision with Deficiencies, UtahAmerican Energy, Inc.,
Horse Canyon Mine, ACT/007/013-SR98(1), Outgoing File

Dear Mr. Marshall:

The Division has completed the 3rd Technical Analysis (TA) of your application to permit the Lila Canyon Tract as part of the Horse Canyon Mine, (see enclosed).

Please review the TA carefully to make sure you understand the 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.

Please submit your response within 90 days or we will have to return your application. Please call me if you have any questions, or would like to set up a meeting to discuss the deficiencies.

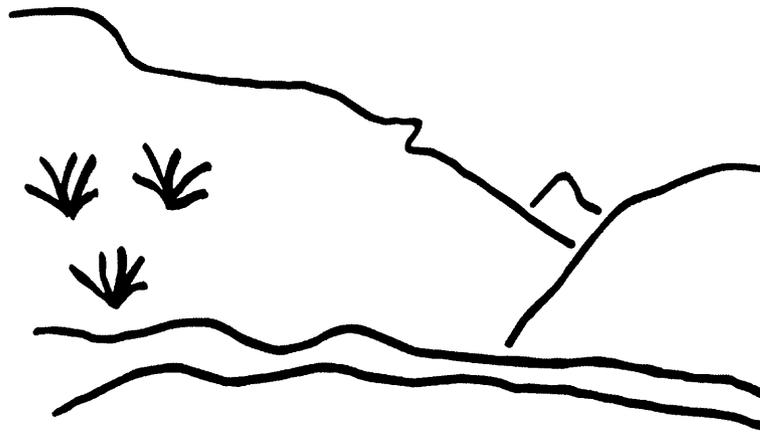
Sincerely,

A handwritten signature in cursive script, appearing to read 'Pamela Grubaugh-Littig'.

Pamela Grubaugh-Littig
Permit Supervisor

sm
Enclosure
cc: 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
ACT/007/013-SR99(1)-3
Technical Analysis
February 23, 2000

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INTRODUCTION

INTRODUCTION

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

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

COMPLETENESS

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

SUMMARY OF OUTSTANDING DEFICIENCIES

Revised: January 23, 2000

and that are consistent with other reclamation practices (e.g., pocking). Drilling, discing or raking are not compatible with extreme rocky soils, rocky surfaces, or with surfaces that have been deep gouged or pocked. 94

R645-301-321, It appears woody plant densities in the 1999 vegetation study were not calculated properly, and this needs to be corrected. 20

R645-301-321, The 1999 vegetation study identifies medusahead rye as occurring in the grass/shrub reference area, and the report lists it as a desirable species. Medusahead rye is a noxious weed, so it should not be listed as a desirable species. The applicant needs to confirm the identification as it is not likely this species grows in the area. 20

R645-301-321, The applicant has not proposed to remove the 1998 vegetation report in Appendix 3-2 from the application. This report has several problems as discussed in previous technical analyses, but with some corrections, deletions, and reorganization, it would probably be possible to use some of the information. 20

R645-301-321, The applicant needs to include complete woody plant density information. 21

R645-301-321, The applicant needs to provide vegetation productivity information for the areas proposed to be disturbed and for the reference area. 20

R645-301-322, Section 322.220 of the text indicates the proposed disturbed area contains critical elk and deer winter range, but this is not reflected on Plate 3-1. Either the text or the map needs to be corrected. 24

R645-301-322, The list of threatened or endangered species in Table 3-1 should be updated; peregrine falcons are no longer listed. Also, the Lahontan cutthroat trout would not be expected in Emery county but the razorback sucker would. 24

R645-301-323, The application says the revegetation reference area is shown on Plate 3-1, but this statement needs to be corrected. The reference area is shown on Figure 1 of the report for the 1999 vegetation inventory. 102

R645-301-331, Correct the mistake in Section 331, the application says the permit area would be 40.77 acres. 72

R645-301-333, Identify what measures will be made during the life of the mine to protect the undisturbed island areas from mining related impacts, such as blowing coal fines, vehicle traffic, and other uses that would disturb and/or otherwise negatively impact the undisturbed vegetation and topsoil resources. 71

R645-301-333, The applicant has committed to not subside escarpments that contain eagle nests, but it appears the area near one nest would be subsided. The applicant

SUMMARY OF OUTSTANDING DEFICIENCIES

Revised: January 23, 2000

needs to show how nests in the subsidence areas would be protected or what mitigation will be done. The Fish and Wildlife Service has suggested building alternative nest sites in the area. 64

R645-301-341.220, Chapter 2 says seed will be broadcast, but Chapter 3 indicates it will be either broadcast or drilled. The applicant needs to correct this discrepancy. Drill seeding is likely to reduce surface roughening, and this method should not be used. 102

R645-301-341.220, Chapter 2 says seed will be broadcast, but Chapter 3 indicates it will be either broadcast or drilled. The applicant needs to correct this discrepancy. Drill seeding is likely to reduce surface roughening, and this method should not be used. 102

R645-301-341.230, Chapters 2 only discusses hydromulching, but Chapter 3 says inaccessible areas will be mulched with straw. This inconsistency needs to be resolved. The straw mulching plan includes crimping the straw, and this would tend to decrease surface roughness. The Division would rather the straw not be anchored than to use a method that would decrease the amount of roughness. 102

R645-301-341.250, The applicant needs to clarify the success standards for seasonality and diversity. 102

R645-301-341.250, The application needs to demonstrate that the introduced species proposed for use in the plan for final reclamation are desirable and necessary for achieving the postmining land use. 101

R645-301-341.250, The proposed success standard for erosion control is generally acceptable, but the applicant needs to commit to demonstrate compliance with several samples showing a trend, and every drainage leading away from the disturbed area must be included in the sampling regimen. 102

R645-301-341.300, R645-301-354, The revegetation plan shows two warm season species being planted in the fall where experience in other states indicates these species could be best established by planting them in the summer. To test whether summer or fall seeding is best, the applicant needs to designate at least one area of the mine where interim vegetation would be established and plant blue grama and galleta in the summer. This treatment could be compared to fall seeding. The application needs to show where this would be done and discuss how the site would be monitored. 101

R645-301-411.110, Boundaries of the Turtle Canyon Wilderness Study area and the areas identified in the 1999 wilderness inventory as having wilderness characteristics need to be shown on a land use map, such as Plate 4-2. 30

SUMMARY OF OUTSTANDING DEFICIENCIES

Revised: January 23, 2000

- R645-301-411, In Section 411.110, the application refers to Figure 1 for information on big game and raptor habitat, but this figure could not be found. This reference needs to be corrected. 30
- R645-301-521.190, The applicant must give the Division a copy of the letter from the State Engineer stating that the sediment pond design has been approved. 85
- R645-301-521, The applicant must be consistent with showing the disturbed area boundaries. On Plate 5-2 the applicant shows that all land within the disturbed area boundary is disturbed. On Plate 2-3 the applicant shows 3 undisturbed areas within the disturbed area boundaries. If the applicant intends to have undisturbed islands with the disturbed area boundary then the island must be marked. The applicant cannot use the disturbed area boundaries for mining or reclamation without amending the permit. 87
- R645-301-521, The applicant should identify the areas labeled on Plate 5-1 as the **Horse Canyon Permit** and the **Lila Canyon Significant Revision to the Horse Canyon Permit** or the **Lila Canyon Tract to the Horse Canyon Permit**. The applicant should identify the complete Wilderness Study areas on at least one Plate. 51
- R645-301-521, The applicant should submit detailed designs showing size slope and height of all features of the sedimentation pond and adjacent area, see deficiencies under Operation Plan. Plates 7-5 and 7-2 show a "Refuse Pile" location above drainage DD-4, this has to be corrected. All the culverts are not identified on Plate 7-2. Their size and length should be stated. 87
- R645-301-521, The surface reclamation map should show reclamation contours of the sedimentation pond and culvert UD-6 in place and removed. 97
- R645-301-522 and R645-301-525.240, The applicant 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. 58
- R645-301-525.110, The applicant must show the location of the escarpments that need to be protected from subsidence on Plate 5-3 or other suitable map. 61, 62
- R645-301-525.440, The applicant does not give details of the subsidence monitoring plan. The only information about the plan is that it will involve aerial surveys. The Division needs to know the number and location the subsidence monitoring points before plan can be evaluated. The subsidence monitoring points must be shown on Plate 5-3 or other subsidence maps. 61
- R645-301-525.440, The Division finds the monitoring program inadequate because the

SUMMARY OF OUTSTANDING DEFICIENCIES

- survey time is too short. The Division usually requires the applicant to monitor 5 years and wants assurances that subsidence has stopped for 3 years before the subsidence survey is ended. 61
- R645-301-525.440,** The subsidence monitoring program must include a ground survey. The ground survey is needed to find cracks that could affect surface water. Note: the Division did require the applicant to remove a phrase from the amendment that involved a ground survey being needed to verify subsidence damage before mitigation could occur. The Division did not want the ground survey to be removed rather that mitigation would only occur after a ground survey was conducted R645-301-122. The applicant 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. 61
- R645-301-525.490,** The applicant must show on Plate 5-5 or other similar maps those areas where subsidence control methods (first mining only) will be used to protect surface structures such as escarpments, seeps and springs and eagle nests. 87
- R645-301-526.133 and R645-301-526.116,** The applicant must show how the public will be protected from mining and reclamation activities constructed within 100 feet of the county road. Specifically the applicant must address how the public will be protected from the hazards associated with the sediment pond and other mine facilities. 57
- R645-301-528.332,** The applicant needs to show the location of the on site concrete disposal areas and describe how the concrete will be placed and covered. If the applicant intends to dispose of noncoal mine waste in an area that is not a state approved facility then they must submit designs to show that no leachate will enter the groundwater or surface water. 77
- R645-301-533.100,** The applicant should submit information on Plate 7-6 which details the outslope embankments, slope and size of culvert, UD-6, beneath pond, roadway width and slope, locations and design of trash-racks, locations and design of discharge pads, emergency spillway design, path of emergency discharge, sediment cleanout marks and topographic relationship of sediment pond to undisturbed channel using scale of 1 foot intervals. 85
- R645-301-533.300,** The applicant must show how the pond will be protected against sudden drawdown. Specifically the applicant must show that pore pressure in the embankments will not cause the pond to fail should a sudden drawdown occur. 85
- R645-301-533.700,** The applicant must label the contour lines on Plate 7-6. The applicant must also show the correct location of the emergency spillway on the contour maps. The elevation of the emergency spillway is shown between 5839 and 5841

SUMMARY OF OUTSTANDING DEFICIENCIES

Revised: January 23, 2000

feet on Plate 7-6. The table shows the elevation to be 5841 feet.	85
R645-301-536.100 , The designs for the refuse pile must include the detailed cross sections and maps.	77
R645-301-542 , The applicant must give the Division detailed cross section of the reclaimed surfaces. The cross section must also show highwall elimination.	104
R645-301-553.120 , In Section 553.120 the applicant must give the Division detailed maps and cross sections of the portal areas. Without that information the Division cannot make a finding about the adequacy of the highwall elimination plan. The Division needs a cross section of profile of each portal. The portals must be identified on the cross sections. Note: by definition a highwall will be created as part of the portal. See analysis section for more details.	90
R645-301-553.130 , In Section 553.130 the applicant states that all reclaimed slopes will have a static safety factor of at least 1.3. The applicant did not provide the slope stability analysis that supports the 1.3 safety factor claims for the reclaimed slopes. The Division did not receive that information.	90
R645-301-553.300 , The applicant does not address how combustible material and acid and toxic forming materials will be handled. Nor how the applicant will handle coal processing waste.	91
R645-301-722.100 , A water right for the Minerals Development Corporation (MDC) well is listed in Table 7-2. The MDC well and another well that is located nearer the Horse Canyon Mine surface facilities are discussed in Section 722.400. Both wells are shown on Plate 7-1 but they are not clearly identified.	51
R645-301-722.300 , Horse Canyon Mine UPDES discharge points 001, 002, and 003 are shown on Plates 7-1 and 7-4. Currently monitored UPDES discharge points 001A and 001B are not shown on either map.	51
R645-301-724.200 , Table 7-2 lists water right 91-4516 as being in Little Park Wash, but this water right is not shown on Plate 7-3, and the location listed in Table 7-2, Section 17, T. 16 S., R. 15 E., is not in Little Park Wash drainage.	51
R645-301-724 , The applicant should provide seasonal records of precipitation and temperature range data.	17
R645-301-731.210 , L-6-G (Mont Spring) corresponds with spring H-21 monitored by JBR Consultants in 1985. There are baseline data for spring H-21, for 1985 only, in Appendix 7-6 of the Lila Canyon Significant Revision. L-7-G (Leslie Spring) corresponds with H-19. There are no baseline data for spring H-19. Baseline data for L-6-G (H-21) and L-7-G (H-19) are not adequate.	45

SUMMARY OF OUTSTANDING DEFICIENCIES

Revised: January 23, 2000

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- R645-301-731.210**, Spring L-8-G (Cottonwood Spring) does not correspond to any spring that has been monitored previously, so there are no historic baseline data for this spring. Baseline data are not adequate. 45
- R645-301-731.210**, There are some field parameters from 1993 and 1995 for L-10-G (Spring 22, Pine Spring) in Appendix 7-1, but no water-quality analysis reports: this spring was frequently observed to be dry from 1993 to 1995. Baseline data are not adequate. 45
- R645-301-731.220**, Data for HCSW-1 are in Appendices 7-1 and 7-6 and data for HCSW-2 and HCSW-3 are in Appendix 7-1. Locations for HCSW-1 and HCSW-3 could not be found on Plate 7-1. HCSW-2 is marked as a seep or spring on Plate 7-1, rather than as a surface water monitoring site. 52

ADMINISTRATIVE INFORMATION

Revised: January 23, 2000

descriptions and acreages for the federal leases. The total permit area, including both permit area "A" and permit area "B," 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 applicant has no right to mine these areas.

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

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

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

Findings:

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

R645-301-114, The 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.

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.

ADMINISTRATIVE INFORMATION

The application says UtahAmerican Energy has received permission from Emery County to construct mining facilities and conduct mining operations within 100 feet of the road and refers to an agreement letter in Appendix 1-4. The agreement in this appendix is for construction of the road and requires UtahAmerican to acquire an encroachment permit from the county. It also gives certain conditions with which UtahAmerican will need to comply when they receive the encroachment permit. Therefore, although the applicant has begun the process of obtaining permission to mine within 100 feet of a public road, the agreement in Appendix 1-4 is not an encroachment permit.

Findings:

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

R645-301-115, The application needs to contain approval from the public road authority authorizing mining and reclamation operations within 100 feet of a public road.

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 applicant is applying is five years. The beginning of construction is planned for 1999 with mining operations ending in 2023. This assumes adjacent federal leases can be acquired. The timetable in this section is obviously no longer realistic, so it should be updated.

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

R645-301-116, The timetable in Section 116 is no longer realistic, so it should be updated.

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 applicant 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 applicant 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 applicant met the minimum requirements of this section.

HISTORIC AND ARCHEOLOGICAL RESOURCE INFORMATION

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

ENVIRONMENTAL RESOURCE INFORMATION

Revised: February 23, 2000

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; however, the maps and any other information that would allow a person to locate any of the sites should be kept confidential.

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

Findings:

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

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 applicant has provided mean annual temperatures on Page 19, Chapter 7, however seasonal temperature have not been submitted.

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.

Summer thunder storms are common to the area. Baseline data for seasonal precipitation should be provided.

Findings:

R645-301-724, The applicant should provide seasonal records of precipitation and temperature range data.

VEGETATION RESOURCE INFORMATION

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

Analysis:

Appendices 3-1 and 3-2 contain vegetation information about the Horse Canyon and "South Lease" areas. Additional information is in the existing Horse Canyon plan. These studies were done in 1981, 1982, 1983, 1985, 1998, and 1999. With the exceptions of a study by Patrick Collins in Appendix VIII-1 in the current Horse Canyon plan and 1998 and 1999 vegetation inventories in Appendix 3-2 of the application, the application does not show who conducted the studies as required in R645-301-120.

The 1998 and 1999 vegetation inventories were site-specific to the proposed disturbed area and nearby proposed reference area, and the following discussion concerns these reports. Figure 1 in the 1998 study shows sampling locations in two vegetation communities, pinyon/juniper and shrub/grass. The 1999 study includes a map showing the vegetation communities in relation to the proposed disturbance, but it does not show sample locations.

Neither the 1998 nor the 1999 study alone provides adequate vegetation information, but together and with some corrections and compilation, they would provide enough vegetative cover information. Problems with the 1998 study are discussed in the technical analyses sent May 26 and October 18, 1999. The application does not provide enough information about woody plant density or productivity.

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.

In the 1999 study, medusahead rye was identified as being in the reference area, and it was included in the list of desirable species. Medusahead rye is a noxious weed and should not be classified as a desirable species, but it is unlikely this species actually occurs in the area. A Division representative has identified a similar species, bottlebrush squirreltail, in the area, and the plants identified as medusahead are probably actually squirreltail. The applicant should confirm the identification. Medusahead is an extremely serious problem on certain rangelands, and if the plants really are medusahead, the Division and Bureau of Land Management would have grave concerns about spreading this weed through disturbance.

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

The applicant should be able to correct and reassemble some of the data from the 1998 study.

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The Division needs to have certain vegetation information about the pinyon/juniper area, and it appears this information is available from the 1998 study. First, the applicant could rewrite the methods section and not include any discussion about statistical methods or about the grass/shrub community. Information about the grass/shrub area is in the 1999 report. Second, the applicant could confirm the identification of *Ferocactus* sp. (most likely *Echinocereus triglochidiatus*) and snakeweed or green rabbitbrush and change the species shown in the report according to what actually occurs in the area. Next, the data for the proposed disturbed pinyon/juniper area only, not the reference area, could be presented as percentages of cover rather than as numbers of hits. Information about statistical analyses should be deleted, and it will be impossible to do statistical analyses on this data without information from individual transects.

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

The information presented on woody plant densities is either incomplete, does not have units, or was apparently not calculated correctly. Woody plant densities shown in the 1998 study do not include units although it is assumed they are numbers per acre. If this is correct, the proposed disturbed pinyon/juniper area had 1800 woody plants per acre of which 1390 were green rabbitbrush (or snakeweed). After confirming the units and one plant identification, the applicant should be able to include woody plant density information for the pinyon/juniper area in the application.

Tables 1 and 2 of the 1999 study show woody plant densities in the reference area and the proposed disturbed grass/shrub community. The methods section of the report indicates woody plants were measured in 0.01-acre plots, so the numbers of woody plants in each plot should be listed as occurring at a rate of a multiple of 100 per acre. Instead, they are in multiples of about 59 per acre. According to verbal information from the applicant, the report needs to be changed.

Using the correct conversion for the numbers of shrubs in the plots, the data indicates there are 120 woody plants per acre in the proposed disturbed area and 147 per acre in the reference area. This is surprisingly few. The consultant that did the report indicated verbally to the Division that they decided not to include snakeweed in their measurements of the woody plants since snakeweed is an undesirable species. Assuming the "green rabbitbrush" of the 1998 study was actually snakeweed, there should be about 1200-1390 snakeweed plants per acre in the grass/shrub community.

The applicant needs to supply complete information on woody plant density. No species should be excluded because it is undesirable. The applicant should take and report data by species and analyze and allow the Division to analyze the data for what it shows.

The application is required to contain productivity estimates for the area proposed to be disturbed and associated reference area (if that is the method to be used to determine revegetation success). Appendix 3-7 contains a letter from George Cook of the Natural Resources Conservation Service with

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productivity estimates for two shadscale/grass and for two grass/shrub communities. It is unclear from the letter where these estimates were done. Most of the proposed facilities area has a pinyon/juniper community, but there is no productivity estimate for a pinyon/juniper community.

The Division has received a letter from Mr. Cook, now retired from the NRCS, giving production estimates for the grass/shrub reference area, the pinyon juniper proposed disturbed area, and the pinyon/juniper reference area. It does not show productivity information for the grass/shrub proposed disturbed area. All of this productivity information needs to be included in the application. The application also needs to contain copies of the data sheets for the productivity estimates and site ratings.

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

Findings:

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

R645-301-131, All technical data submitted in the permit application must be accompanied by the names of persons or organizations that collected and analyzed the data, dates of the collection and analysis of the data, and descriptions of the methodology used to collect and analyze the data. This information is not complete for some studies in Appendices 3-1 and 3-2.

R645-301-321, The applicant needs to provide vegetation productivity information for the areas proposed to be disturbed and for the reference area.

R645-301-321, The applicant has not proposed to remove the 1998 vegetation report in Appendix 3-2 from the application. This report has several problems as discussed in previous technical analyses, but with some corrections, deletions, and reorganization, it would probably be possible to use some of the information.

R645-301-321, The 1999 vegetation study identifies medusahead rye as occurring in the grass/shrub reference area, and the report lists it as a desirable species. Medusahead rye is a noxious weed, so it should not be listed as a desirable species. The applicant needs to confirm the identification as it is not likely this species grows in the area.

R645-301-321, It appears woody plant densities in the 1999 vegetation study were not calculated properly, and this needs to be corrected.

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R645-301-321, The applicant needs to include complete woody plant density information.

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.

Section 322.220 of the text discusses the types of habitats where these species occur and certain aspects of their life histories. It says the actual disturbed area contains critical deer and elk winter range in addition to habitat for Rocky Mountain bighorn sheep. The statements about deer and elk habitat conflict with the information on Plate 3-1, and this needs to be resolved.

Raptor surveys were conducted in the area in 1990, 1998, and 1999. Plate 3-2 shows locations of six nests in or near Lila Canyon, and Appendix 3-5 contains further information, including two maps showing nest locations. Wildlife Resources commented that the 1998 raptor survey documented three nests at the mouth of Lila Canyon.

The text says results of the 1998 and 1999 raptor surveys are in Appendix 3-5, but Appendix 3-5 does not contain results for the 1999 survey. Plate 3-1 may have these results, but it is not certain. Section 323.300 says an active nest was found in the 1999 survey in the left fork of Lila Canyon within the one mile buffer zone. Plate 3-1 shows three tended nests near the proposed disturbed area, but it does not show any of these as being active. It appears Plate 3-1 is the best compilation of raptor nesting data in the application although two other reports in Appendix 3-5 include some information. The baseline information is considered adequate to plan wildlife protection measures.

Plate 5-3 now shows raptor nests and subsidence limits. According to this map, one golden eagle nest would be in the subsidence area.

The text mentions a prairie falcon scrape found in the east half of section 9, but it is not shown on any of the maps. This scrape is outside the area of proposed mining activities.

According to Section 322.220, the entire permit area plus an area within 1 mile of the proposed surface facilities were surveyed for raptor nests.

The applicant commits to conduct raptor surveys one year prior to all proposed (assume proposed) new construction or potentially disruptive mining activity. This should be done in all suitable

habitat within a one mile radius of these activities.

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 eight threatened or endangered species the application says may occur in Emery county or that could be affected by the mine. This list should be updated since peregrine falcons are no longer listed as threatened or endangered. Also, the Lahontan cutthroat trout would not be expected in Emery county, but the razorback sucker (*Xyrauchen texanus*) would. 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

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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.

According to Mr. Thompson, the Wright fishhook cactus (*Sclerocactus wrightiae*) also has potential of occurring in the area. It grows in salt desert shrub and shrub/grass to juniper communities in soil derived from Mancos Shale and other formations.

The applicant's consultant searched for the Despain footcactus and Wright fishhook cactus and did not find them. This is documented in a report in Appendix 3-4.

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.

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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 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 supply the following in accordance with:

R645-301-322, Section 322.220 of the text indicates the proposed disturbed area contains critical elk and deer winter range, but this is not reflected on Plate 3-1. Either the text or the map needs to be corrected.

R645-301-322, The list of threatened or endangered species in Table 3-1 should be updated; peregrine falcons are no longer listed. Also, the Lahontan cutthroat trout would not be expected in Emery county but the razorback sucker would.

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 Significant Revision. Relevant soils information includes prime farmland investigation, current and published soil surveys, soil characterizations, and substitute topsoil identification. The Analysis section discusses resource information as follows:

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

Prime Farmland Investigation

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

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Soil Survey Information

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

(1) General, Third Order Soil Survey

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

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

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

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

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

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

(2) Site specific, First Order Soil Surveys

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

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

All mapping and soil survey work were performed according to the standards of the National Cooperative Soil Survey. Based on the site-specific soil descriptions, and laboratory data, each soil was classified according to current, unpublished NRCS soil taxonomy, and correlated with to a specific soil series. The RBT soil unit references the Travessilla family complex; however, the Travessilla family has been revised by NRCS and based on changes, the Atchee series is more appropriate to Map Unit RBT based on personal conversation between Dan Larsen and Leland Sassar, July 1999.

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

Soil Characterization

Soil pedons were characterized by the soil horizons at each sampling location. All profile descriptions were recorded on standard NRCS forms and are provided in Appendix D within Appendix 2-3. The soil horizons at each sampling location were sampled and characterized according to the State of Utah Division of Oil, Gas and Mining (DOGM) guidelines for topsoil and overburden¹. Sampled 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

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.

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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:

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

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

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

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

- **Soil textures** were classified as sandy loam, except for samples LC1 3-10" and LC10 0-4" which were sandy clay loam and silt loam respectively. Based on soil texture, all soils tested are rated as good for reclamation material.

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- **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. However, the cross-over can occur were calcium is being removed from the soil solution by calcium carbonate precipitation, which explains the higher magnesium level in the lower soil horizons containing higher levels of calcium carbonate.

- **The percent rock content** within the proposed facilities area is the main deterrent for soil suitability based on the current DOGM guidelines. Appendix 2-3 reports that native soils with a higher rock content than the current DOGM guidelines allow, can be salvaged. DOGM encourages salvaging **native soils with intrinsic or indigenous rock content**. Using these natural rocky soils should enhance reclamation success by providing an environment similar to native conditions. Natural, intrinsic rock content provides for a more stable reclaimed surface, aids in water harvesting and water holding capacity of interstitial soils, and creates wildlife habitat and niches on the surface were surface boulders and larger cobble sized rocks are placed. However, care must be taken to avoid higher rock content in surface soils than is present in the undisturbed surface. Every effort should be made to minimize mixing the deeper subsoils containing extremely higher rock content with the surface soils and shallow subsoils containing lower amounts of rock.

Substitute Topsoil

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

Findings:

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

LAND-USE RESOURCE INFORMATION

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

Boundaries of the Turtle Canyon Wilderness Study area and the areas identified in the 1999 wilderness inventory as having wilderness characteristics, both discussed below, should be shown on a land use map, such as Plate 4-2.

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.

In Section 411.110, the application refers to Figure 1 for information on big game and raptor habitat, but this figure could not be found. Information on big game and raptors is in Chapter 3 and on Plate 3-1.

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 and is very close to, and may even overlap, 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

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

R645-301-411.110, Boundaries of the Turtle Canyon Wilderness Study area and the areas identified in the 1999 wilderness inventory as having wilderness characteristics need to be shown on a land use map, such as Plate 4-2.

R645-301-411, In Section 411.110, the application refers to Figure 1 for information on big game and raptor habitat, but this figure could not be found. This reference needs to be corrected.

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

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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 applicant has submitted sufficient information for this section.

GEOLOGIC RESOURCE INFORMATION

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

Analysis:

The applicant 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, but those sources are not adequately described nor listed in a reference section. Many of the publications cited are probably available to the Division and the general public through libraries, but they will be difficult to locate unless explicit citations are provided. Complete, usable references are needed, either at the end of each chapter or in one comprehensive reference section for the entire Lila Canyon Significant Revision. The partial References list at the end of Appendix 7-3 has been copied to the end of Chapter 7 but no additional references have been added: the same list is at the end of Chapter 6 - Hydrology in the current Horse Canyon Mine MRP. Some references that were of a general nature have been eliminated from the text on pages 7 and 40 of Chapter 6 of the Lila Canyon Significant Revision, but the following citations in Chapters 6 and 7 or their Appendices are STILL not on any reference list:

Chapter 6:

Abbott and Liscomb, 1956 (p. 7).

Balsley and Horne, 1979 (p. 7).

Clark, 1928 (p. 7).

Doelling, 1972 (p. 7).

Fisher, 1936 (p. 7).

Fisher, Erdmann, and Reeside, 1960 (p. 7).

Osterwald and Mayberry, 1974 (p. 7).

Young, 1955, 1957, and 1966 (p. 7).

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Chapter 7:

Waddell and others, 1983 (p. 11).

Appendix 7-3

Balsley, 1981 (p. 5).

Sieler and Baskins, 1986 (p. 4).

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 the slope-rock material 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 VI-3 does not indicate that these wells have been plugged and abandoned; however, the applicant 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 applicant 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 applicant states that other than the log there are no other geologic or piezometric data

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from S-32 (Section 6.5.1, p. 21).

Two other wells were bored in Horse Canyon to monitor water in the alluvium. The well near the main Horse Canyon facilities will be used during mining and reclamation operations and sealed after reclamation is complete. To the applicant'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).

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 Significant Revision 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 applicant 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 applicant 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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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 applicant 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 applicant 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 not considered adequate to meet the requirements of this section. Prior to approval the applicant must provide the following information:

R645-301-122, -624.130, Some outside sources cited in the text are STILL not listed in a "reference" section:

Chapter 6:

Abbott and Liscomb, 1956 (p. 7).
Balsley and Horne, 1979 (p. 7).
Clark, 1928 (p. 7).
Doelling, 1972 (p. 7).
Fisher, 1936 (p. 7).
Fisher, Erdmann, and Reeside, 1960 (p. 7).
Osterwald and Mayberry, 1974 (p. 7).
Young, 1955, 1957, and 1966 (p. 7).

Chapter 7:

Waddell and others, 1983 (p. 11).

Appendix 7-3

Balsley, 1981 (p. 5).
Sieler and Baskins, 1986 (p. 4).

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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).

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

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

Baseline Information

Within the permit area, the surface water resources consist of three main drainages: Horse Canyon Creek, an intermittent stream, Little Park Wash, an intermittent stream and Lila Canyon Creek, an intermittent stream. Horse Canyon flows to Icelander Wash which, in turn, flows to Grassy Trail Creek and the Price River. Little Park Wash flows southward to Trail Canyon and the Price River. Lila Canyon flows southwest to Grassy Wash, then south to the Marsh Flat Wash and the Price River. (See Plate 7-1)

Generally, Horse Canyon, Little Park and Lila Canyon Creeks flow during the spring snowmelt runoff period and also as a result of isolated summer thunderstorms. Due to the limited drainage area and elevation of Lila Canyon, the duration of the snowmelt flows is quite short and is limited to the very early spring. Locations of all baseline data points are shown on Plate 7-1. Baseline data information is included in Appendix 7-1. There are no streams, lakes or ponds or irrigation ditches known to exist within the proposed permit or adjacent areas. By late spring to early summer, usually no flow is evident in Horse Canyon Creek, below the minesite or Lila Canyon Creek.

This will be an underground mine with approximately 39.81 acres of surface disturbance for mine site facilities and roads. Runoff from the disturbed minesite area is proposed to be controlled by a system of ditches and culverts which will convey all disturbed area runoff to a sediment pond for final treatment prior to discharge.

Based on results of the PHC determination, base-line study and other available information, numerous small springs and seeps exist within, and adjacent to, the permit area. In addition, ephemeral drainages in the area flow in response to snow melt and precipitation events. The proposed surface-water monitoring program will monitor the significant surface water sources, including drainages above and below the disturbed mine site area, and all point-source discharges (i.e. sediment pond).

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, eight nitrogen species and other 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, 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 parameters that were analyzed were derived from 30 CFR 783.16 (Note: 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, and RF-1 (but apparently 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 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.

Surface- water monitoring site B-1 is associated with HC-2 in Appendix 7-2, but HC-2 is associated with spring H-2 in Appendix 7-6. Sites B-1 and H-2 are approximately 2 miles apart on Plate 7-1. It needs to be clarified whether HC-2 is a surface or ground-water monitoring site and whether it corresponds with B-1 or H-2.

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

Springs H-1, H-6, H-18, and H-21 were sampled once, in 1985, and analyzed for the major constituents. Analysis results are in Appendices 7-2 and 7-6: field data for these and fifteen other springs are in Table 7-1 of the Lila Canyon Significant Revision.

Baseline monitoring of the Intermountain Power Authority (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 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, 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.

Ground-water Information

Seeps, springs and potential mine water discharge will be monitored in accordance with the Ground Water Monitoring Plan in Chapter 7.

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. 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 applicant has no data on A-26 and A-31 (Section 6.5.1) and considers these wells unusable (Section 724.100).

Two other wells were bored in Horse Canyon to monitor water in the alluvium. The well near the main Horse Canyon facilities will be used during mining and reclamation operations and sealed after reclamation is complete. To the applicant'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 applicant states that other than the logs in Appendix 6-2 there are no geologic or piezometric data from S-32 (Section 6.5.1, p. 21).

In 1993 and 1994, IPA-1, IPA-2, and IPA-3 were drilled. Water-levels were measured seasonally by IPA in 1994, 1995, and 1996 to provide baseline data for the South Lease. Data have not been collected since, but the applicant commits to resuming water-level monitoring upon approval of the Lila Canyon Significant Revision (724.100, Table 7-3).

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. Information in Appendix 7-6 can be used to correlate most of these identifiers, but there are

still a few that are questionable or that cannot be matched.

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 collected in 1985 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-2, H-4, H-11, H-13, H-14, and H-18 for 1994 and 1995 and for H-1, H-6, H-10, and H-21 for November 1985 are in Appendix 7-6.

Springs identified by JBR Consultants Group as H-21A, H-21B, H-18A, and H-18B were shown on a preliminary Plate 7-1 but were not listed or discussed in the Lila Canyon Significant Revision: the applicant 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 14). The applicant states that HC-1A is not on Plate 7-1 for the same reason; however, HC-1A is still on Plate 7-1.

Appendices 7-1 and 7-6 contain seasonal information on ground-water quality and flow for seeps and springs 1 (same as S-1), 9 (S-9), 10 (S-10), 14 (S-14), 16 (S-16, 16Z, ?16A?), 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 the Los Angeles Department of Water and Power. 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, total alkalinity, and acidity were not reported (bicarbonate and carbonate were 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.

Annual reports were reviewed back to 1993, and total manganese was not specified in any of the analysis reports: manganese was reported but this may be either total or dissolved manganese - it is not clear. Table 1 in Appendix VI-5 of the current Horse Canyon Mine MRP specifies total manganese will be determined as part of operational monitoring of surface water, but Table 3 in that MRP appears to specify that only dissolved manganese will be determined for ground water. 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.

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 or otherwise unidentified springs listed, plus a well. 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 a well is listed in Table 7-2, but information in other parts of the Lila Canyon Significant Revision indicate this was

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a water monitoring well that has been abandoned and, to the best of the applicant's knowledge, plugged.

Surface-water Information

The plan will provide data to show impacts to potentially affected springs, seeps, impoundments and drainages within and adjacent to the permit area, by comparison with relevant baseline data and with applicable effluent limitations

Surface-water quality will be protected by handling earth materials, ground-water discharges and runoff in a manner that minimizes the formation of acid or toxic drainage; prevents, to the extent possible using the best technology currently available, additional contributions of suspended solids to streamflow outside the permit area; and, otherwise prevent water pollution.

Surface-water quality protection is proposed to be accomplished by the plan described in Section 731 and the following methods:

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

Within and adjacent to the permit area, the surface water resources consist of three main intermittent drainages: Horse Canyon Creek, Lila Canyon Creek, and Little Park Wash (Section 724.200). The location of all known seeps and springs, as well as watering ponds or tanks are shown on Plate 7-1 (Section 722.200), although there are no watering ponds and tanks evident on the map. The applicant 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).

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 Little Park Wash. There has been no flow during quarterly observations in 1998 and 1999 (Section 724.200). Spring flows in this drainage

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dry-up, dissipate, or go underground before reaching the main drainage.

Range Creek drainage is the nearest perennial stream to the Lila Canyon SR. It is approximately 6 miles east of the proposed Lila Canyon mine entries and separated from mine area by the drainage divide at the top of the Roan Cliffs. Because of the distance from the Lila Canyon SR, there has been no collection of baseline hydrologic data from Range Creek (Section 724.200). Direct impacts from mining are not expected. DOGM recommends the applicant conduct a baseline and operational water monitoring plan to provide basic data and identify the existence of no impacts. The monitoring is suggested to protect the applicants interests, since other commercial activities are being conducted in Range Creek at the same time mining activities are proposed for the Lila Canyon project.

Data for HCSW-1 (HSW-1?) are in Appendices 7-1 and 7-6. Data in Appendix 7-1 show HCSW-2 and HCSW-3 were dry when monitored in 1994 and 1995. Locations for HCSW-1 and HCSW-3 could not be found on Plate 7-1. HCSW-2 is marked as a seep or spring, rather than as a surface water monitoring site on Plate 7-1. Horse Canyon Mine UPDES discharge points 001, 002, and 003 are on Plates 7-1 and 7-4. Baseline data for these sites 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 Plants, 1981). By late spring to early summer, usually no flow is evident in Horse Canyon Creek, below the minesite or Lila Canyon Creek." Flow monitored in the valley at B-1 (HC-2) in 1989 was intermittent (Appendix 7-2).

Discharge from the mine to Horse Canyon Creek at 001 and 002 appears to have been constant from May 1981 to June 1983, although flows were typically small. Flow volume at discharge point 003 below the mine was not reported, although water samples were collected throughout the 3-year period. Any surface-water data from this period, or earlier, would mainly be mine-discharge water rather than surface runoff.

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. Table 7-2 lists water right 91-4516 as being in Little Park Wash, but this water right is not shown on Plate 7-3, and the location listed in Table 7-2, Section 17, T. 16 S., R. 15 E., is not in Little Park Wash drainage.

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

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by the applicant as part of the permit application. As discussed already, outside sources are referenced many times in Chapters 6 and 7, but the outside sources are not adequately described nor listed in a reference section.

The permit cannot be approved until the necessary hydrologic and geologic information is available.

The Division will make a findings of the cumulative impacts when the Mining and Reclamation Plan is complete.

Modeling

Modeling has not been used in preparation of the Lila Canyon Significant Revision.

Alternative Water Source Information

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

The Probable Hydrologic Consequences (PHC) Determination is provided as a separate document in Appendix 7-3. This determination indicates negative impacts of the mining or reclamation operation on the quality and quantity of surface and ground water under seasonal flow conditions for the proposed permit and adjacent areas.

The applicant identifies potential adverse impacts in Chapter 7 which consist of :

1. Increasing sediment loading;
2. Diminution or interruption of water supplies on water rights;
3. Discharge of contaminated groundwater;
4. Erosion and streamflow alteration;
5. Deterioration of water quality.

Each of the above potential impacts have been evaluated in the PHC.

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Water in this area is primarily used for stock or wildlife watering. Any impacts to the small surface springs or seeps as a result of mining would likely be offset by the emergence of new seeps or springs due to fracturing, mine water discharge or replacement of water rights as described under Sections 525, and 731.800.

With underground mining, there always exists a potential for impacting surface or ground water resources; however, as indicated in Section 525, subsidence effects are expected to be minimal due to the amount of cover and massive rock strata between the mining and the surface. Effects on underground water are also expected to be minimal, since this water is not presently issuing to the surface, and any necessary discharges of the water would be in accordance with U.P.D.E.S. requirements.

The applicant also addresses any potential impacts to receiving streams in the event mine water is discharged from the mine.

The PHC determination is based on baseline hydrologic, geologic, and other information collected for the permit application, but not on data statistically representative of the site. The applicant 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 applicant has determined that within the Lila Canyon Significant Revision area the general seasonal streamflow is ephemeral. The streams generally dry up by late spring, with only occasional runoff during the summer as the result of rainfall events (Appendix 7-3, page 7).

The applicant has determined (Appendix 7-3) 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 facilities 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 (Appendix 7-3, page 4). 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. 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 (presumably to UPDES standards).

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 presents a 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

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

The applicant 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 facilities, 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 facilities so that water levels can be checked annually.

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

Ground-water and Surface-water Monitoring Plans

The applicant has based the ground-water and surface-water monitoring plans on the PHC determination and the analysis of baseline hydrologic, geologic, and other information in the permit application.

Water samples from seeps, springs, and streams will be analyzed for the parameters listed in Tables 7-4 and 7-5. The parameters in Tables 7-4 and 7-5 match those in Tech 004

Monitoring reports will be submitted to the Division at least every three months, within 30 days following the end of each quarter.

The applicant'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 applicant has selected monitoring locations and frequencies, described in Table 7-3, so that significant springs, seeps,

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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

Ten sites are proposed for ground-water monitoring: L-5-G through L-11-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-11-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 somewhat described in Table 7-3; however, this relationship is not always clear, especially on the maps in the Lila Canyon Significant Revision.

Three of the springs proposed for operational monitoring are identified by the applicant as L-9-G, L-10-G (Pine Spring), and L-11-G and correspond with the springs monitored by EarthFax as 10, 22, and 14, respectively. Appendices 7-1 and 7-6 of the Lila Canyon Significant Revision contain data on Springs 10 and 14 from 1993, 1994, and 1995, when they were monitored for baseline for the South Lease by IPA, but nothing more recent. There are some field parameters from 1993 and 1995 for Spring 22 in Appendix 7-1, but there are no water-quality analysis results: this spring was frequently observed to be dry from 1993 to 1995.

Spring L-8-G (Cottonwood Spring) does not correspond to any spring that has been monitored previously, so there are no historic baseline data for this spring.

A group of springs was monitored by JBR Consultants in 1985. Additional monitoring was done for some of these springs in 1994 and 1995. L-6-G (Mont Spring) corresponds to JBR sample site H-21 and L-7-G (Leslie Spring) corresponds to JBR sample site H-19. There are baseline data, for 1985 only, for spring H-21 in Appendix 7-6 of the Lila Canyon Significant Revision, and there are no baseline data for spring H-19; therefore, baseline data for L-6-G and L-7-G are inadequate.

A-26 and A-31 were bored as offsets to S-26 and S-31 to observe ground-water levels in the alluvium south of the Williams Draw Fault. Table VI-3 does not indicate that these wells have been plugged and abandoned; however, the applicant has no data on A-26 and A-31 (Section 6.5.1). S-32 was drilled in 1981 and completed as a piezometer in the Grassy Member of the Blackhawk Formation. The applicant considers these sites unusable (Section 724.100).

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. No monitoring is proposed for Little Park Wash, which had no observed flow during 1998 and 1999.

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

Point-source discharge monitoring will be conducted in accordance with 40 CFR Parts 122 and 123, R645-301-751 and as required by the Utah Division of Environmental Health for Utah Pollutant Discharge Elimination System (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. UPDES permit applications for the Lila Canyon Significant Revision are provided in Appendix 7-5.

Findings:

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

R645-301-731.210, L-6-G (Mont Spring) corresponds with spring H-21 monitored by JBR Consultants in 1985. There are baseline data for spring H-21, for 1985 only, in Appendix 7-6 of the Lila Canyon Significant Revision. L-7-G (Leslie Spring) corresponds with H-19. There are no baseline data for spring H-19. Baseline data for L-6-G (H-21) and L-7-G (H-19) are not adequate.

R645-301-731.210, There are some field parameters from 1993 and 1995 for L-10-G (Spring 22, Pine Spring) in Appendix 7-1, but no water-quality analysis reports: this spring was frequently observed to be dry from 1993 to 1995. Baseline data are not adequate.

R645-301-731.210, Spring L-8-G (Cottonwood Spring) does not correspond to any spring that has been monitored previously, so there are no historic baseline data for this spring. Baseline data are not adequate.

R645-301-121.200, -731.220, Surface- water monitoring site B-1 is associated with HC-2 in Appendix 7-2, but HC-2 is associated with spring H-2 in Appendix 7-6. Sites B-1 and H-2 are approximately 2 miles apart on Plate 7-1. It needs to be clarified whether HC-2 is a surface or ground-water monitoring site and whether it corresponds with B-1 or H-2.

R645-301-121.200, -731.220, Is HCSW-1 (Appendix 7-6) the same as HSW-1 (Appendix 7-6)?...the same as HC-1? (Appendices 7-2 and 7-6).

R645-301-121.200, -731.220, Table 7-2 lists water right 91-4516 as being in Little Park Wash, but this water right is not shown on Plate 7-3, and the location listed in Table 7-2, Section 17, T. 16 S., R. 15 E., is not in Little Park Wash drainage.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

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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

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 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 Significant Revision area, so is not expected to limit coal recovery at the Lila Canyon facilities.

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

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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 applicant 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. The applicant should also give the Division copies of any aerial photographs that show the predisturbed site.

In the November 29, 1999 submittal, the applicant 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.

In the November 29, 1999 submittal, the applicant states:

UEI does not have a copy of the 1985 photography but a copy may be obtained by DOGM from Olympus Aerial Survey. Aerial photographs are not available from UEI.

The applicant is responsible for giving the Division all relevant information including aerial photographs.

Mine Workings Maps

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

Monitoring Sampling Location Maps

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

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.

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The Lila Canyon Significant Revision (Table 7-1 and Appendices 7-1 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, ?16A?), 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-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. HC-1 is shown at different locations on Plates 7-1 and 7-3.

Springs H-21A, H-21B, H-18A, and H-18B were previously shown on Plate 7-1 but were not listed or discussed in the Lila Canyon Significant Revision: the applicant 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 14). The applicant states that HC-1A is not on Plate 7-1 for the same reason; however, HC-1A is still on Plate 7-1.

Data for HCSW-1 (is HSW-1 the same as HCSW-1?) are in Appendices 7-1 and 7-6. Data in Appendix 7-1 show HCSW-2 and HCSW-3 were dry in 1994 and 1995. Locations for HCSW-1 and HCSW-3 could not be found on Plate 7-1. HCSW-2 is marked as a seep or spring rather than a surface water monitoring site on Plate 7-1.

Horse Canyon Mine UPDES discharge points 001, 002, and 003 are on Plates 7-1 and 7-4. Currently monitored UPDES discharge points 001A and 001B are not shown.

Data for HC-1, B-1, and RF-1 are in Appendix 7-2 and annual reports. HCSW-2, HC-1, and RF-1 are shown as springs on Plate 7-1. The large black dot, which is used to designate other stream-monitoring sites, is not explained in the Legend of 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.

Subsurface Water Resource Maps

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

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 Minerals Development Corporation (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 applicant's knowledge the MDC well has been sealed. Another 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 Section 724.200. Both wells are shown on Plate 7-1 but they are not clearly identified.

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 applicant 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 applicant 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 of the spring locations in Table 7-2 and on Plate 7-3 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 - Water Rights - 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. The location of RS-2 (Redden Spring) on Plate 7-3 is the same as water right 91-4959 (Table 7-2) on Plate 7-4, but on Plate 7-1 that location is labeled H-6 and RS-2 is at a different location, farther west.

Table 7-2 indicates spring 9 is the same as Cottonwood Spring (L-8-G), but the location of spring 9 shown on Plate 7-1 is approximately one-quarter mile north of the location of Cottonwood Spring shown on Plates 7-3 and 7-4 and described in Table 7-2. The applicant states in Section 731.211 that Cottonwood Spring does not correlate with any seep or spring inventory site identified to date. If so, there are no baseline data for operational monitoring point L-8-G (Cottonwood Spring).

Surface Water Resource Maps

According to the applicant, locations of all known seeps and springs, watering tanks, or ponds are shown on Plate 7-1, and there are no known streams, lakes, or ponds within the permit and adjacent areas. Locations of all baseline data points are shown on Plate 7-1. Baseline data information is included in Appendix 7-1.

Table 7-2 lists water right 91-4516 as being in Little Park Wash, but this water right is not shown on Plate 7-3, and the location listed in Table 7-2, Section 17, T. 16 S., R. 15 E., is not in Little Park Wash drainage.

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 affected area maps.

Vegetation Reference Area Maps

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

Well Maps

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.

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

Contour Maps

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 applicant 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.

Findings:

Information provided in the proposed amendment is not considered adequate to meet the

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requirements of this section. Prior to approval, the applicant must provide the following in accordance with:

R645-301-521, The applicant should identify the areas labeled on Plate 5-1 as the **Horse Canyon Permit** and the **Lila Canyon Significant Revision to the Horse Canyon Permit** or the **Lila Canyon Tract to the Horse Canyon Permit**. The applicant should identify the complete Wilderness Study areas on at least one Plate.

R645-301-521.190, The applicant must give the Division predisturbed, operational and reclamation contour maps that have a scale of not less than 1 inch equals 100 feet and 5 foot contour intervals. The current topographic maps of the predisturbed area have 25' contours and are at a scale of 1" = 200'.

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

R645-301-722.100, A water right for the Minerals Development Corporation (MDC) well is listed in Table 7-2. The MDC well and another well that is located nearer the Horse Canyon Mine surface facilities are discussed in Section 722.400. Both wells are shown on Plate 7-1 but they are not clearly identified.

R645-301-722.300, Horse Canyon Mine UPDES discharge points 001, 002, and 003 are shown on Plates 7-1 and 7-4. Currently monitored UPDES discharge points 001A and 001B are not shown on either map.

R645-301-121.200, -722.200 -722.300, Locations of all known seeps and springs are stated to be shown on Plate 7-1. The location of RS-2 (Redden Spring) on Plates 7-3 is the same as water right 91-4959, (Table 7-2) on Plate 7-4, but on Plate 7-1 that location is labeled H-6 and RS-2 is at a different location, farther west. RF-1 is shown at different locations on Plates 7-1 and 7-4 and is shown as a spring on Plate 7-1. HC-1 is shown at different locations on Plates 7-1 and 7-4, and is shown as a spring on Plate 7-1.

R645-301-121.200, -724.100, The applicant states that HC-1A is not on Plate 7-1 because no sample data or pertinent information are available; however, HC-1A is on Plate 7-1.

R645-301-724.200, Table 7-2 lists water right 91-4516 as being in Little Park Wash, but this water right is not shown on Plate 7-3, and the location listed in Table 7-2, Section 17, T. 16 S., R. 15 E., is not in Little Park Wash drainage.

R645-301-121.200, -731.220, The large black dot, which is used to designate stream-monitoring point B-1 and UPDES points 001, 002, and 003, is not explained in the Legend of Plate 7-1. Not all stream-monitoring sites use this symbol, but are

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shown as springs instead.

R645-301-731.220, Data for HCSW-1 are in Appendices 7-1 and 7-6 and data for HCSW-2 and HCSW-3 are in Appendix 7-1. Locations for HCSW-1 and HCSW-3 could not be found on Plate 7-1. HCSW-2 is marked as a seep or spring on Plate 7-1, rather than as a surface water monitoring site.

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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 applicant proposes to develop a surface facility and mine portals in Lila Canyon. The applicant 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 applicant will install longwall equipment and production could peak at 4,500,000 tons per year.

Type and Method of Mining Operations

Mining will begin in Section 15, T16S, R14E, in the Sunnyside seam. Development of the Sunnyside seam will be in a down dip direction toward the east. The seam will be accessed by two 1,200 foot slopes driven up at 12% from the base of the cliffs. The ventilation fan portal will be driven from underground workings to the surface.

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

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

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

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Ventilation of the mine will be by an exhaust type system. The applicant 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 applicant 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

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The applicant 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 applicant does not plan on cleaning or processing the coal beyond crushing. Any coal mine waste produced from crushing will be placed in the refuse pile shown on Plate 5-2.

In Section 528.100 the applicant describes how the coal will be handled and stored. The applicant 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 applicant 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 applicant 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 applicant 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 applicant 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 applicant 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.

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

Township 16 South, Range 14 East
Section 13, E $\frac{1}{2}$ NW $\frac{1}{4}$, NE $\frac{1}{4}$
Section 24, NE $\frac{1}{4}$ NW $\frac{1}{4}$, N $\frac{1}{2}$ NE $\frac{1}{4}$

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

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

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

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

Findings:

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

RELOCATION OR USE OF PUBLIC ROADS

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

Analysis:

In Section 521.133.1 of the Lila Canyon Amendment the applicant states, Emery County has

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

Appendix 1-4 does not contain any correspondence from Emery County. The only letters in Appendix 1-4 are from the BLM stating that they received right-of-way applications and a letter from Utah American Energy to Rex Funk, county road supervisor. The applicant must either place the documents that show the County gave permission to construct the mine facilities within 100 feet of the County road or remove the reference.

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

Findings:

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

R645-301-526.133 and R645-301-526.116, The applicant must show how the public will be protected from mining and reclamation activities constructed within 100 feet of the county road. Specifically the applicant must address how the public will be protected from the hazards associated with the sediment pond and other mine facilities.

R645-301-121.200, The applicant must either include the letter from Emery County stating that they have approved the construction of the mine facilities next to the county road or remove the reference.

R645-301-121.200, The applicant must either include the MOU with the county or remove the reference. On Page 11 of the Nov. 29, 1999 response the applicant states that MOU with Emery County was added to Appendix 1-4. That appendix does not contain an MOU from the county. The only correspondent with the county is a letter from the applicant to the county dated December 9, 1998.

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.

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

Findings:

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

COAL RECOVERY

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

Analysis:

R645-301-522 requires the applicant 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 applicant must provide the following in accordance with:

R645-301-522 and R645-301-525.240, The applicant 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 applicant 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.

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Analysis:

Renewable Resources Survey

The applicant 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 applicant 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

- (1) 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.
- (2) On Plate 5-5 the applicant shows the proposed underground workings and the areas of potential subsidence. Plate 5-5 not does shows those areas where subsidence control methods (first mining only) will be used to protect escarpments. The applicant shows the location of the seeps, springs, and eagle nests on Plate 5-3. The location of the escarpment that will be protected from subsidence is not shown on any map. Plate 5-3 does not show the complete permit boundary for the Lila Canyon project. Without the permit boundaries the Division is unable to complete the subsidence review.
- (3) R645-301-525.440 requires that the applicant describe the subsidence monitoring plan. The plan is inadequate because it does not give enough details. The proposed plan calls for monitoring points to be established before any 2nd mining. The location of the control points will be determined to within $\pm 6''$ of the actual location. The survey will continue until subsidence measure is less than 10% from the previous years measurement.

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The Division requires that the monitoring program be established before issuing the permit.

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

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

- (4) The applicant state that the escarpments will be protected from subsidence by allowing first mining only within 200 ft. of the outcrops. The applicant refers to the R2P2 for information about why 200 ft. barrier pillars will be used but does not include a copy of the R2P2. The anticipated effects of planned subsidence may include tension cracks, fissures, sinkholes and lowering of the ground surface.

The applicant does not plan to take steps to prevent subsidence except escarpment protection. The applicant 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.

- (5) The applicant states that the anticipated effects of subsidence are:

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

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

- (6) The applicant 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 applicant commits to remediate any damage to water rights.

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Performance Standards for Subsidence Control

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

Findings:

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

R645-301-525.440, The applicant does not give details of the subsidence monitoring plan. The only information about the plan is that it will involve aerial surveys. The Division needs to know the number and location the subsidence monitoring points before plan can be evaluated. The subsidence monitoring points must be shown on Plate 5-3 or other subsidence maps.

R645-301-525.440, The Division finds the monitoring program inadequate because the survey time is too short. The Division usually requires the applicant to monitor 5 years and wants assurances that subsidence has stopped for 3 years before the subsidence survey is ended.

R645-301-525.440, The subsidence monitoring program must include a ground survey. The ground survey is needed to find cracks that could affect surface water. Note: the Division did require the applicant to remove a phrase from the amendment that involved a ground survey being needed to verify subsidence damage before mitigation could occur. The Division did not want the ground survey to be removed rather that mitigation would only occur after a ground survey was conducted R645-301-122. The applicant 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.

R645-301-122, The applicant must change the reference from Plate 5-4 to Plate 5-3 on Page 51 of the submittal. Plate 5-3 shows the location of water rights and eagle nests. Plate 5-4 shows coal ownership.

R645-301-525.110, The applicant must show the location of the escarpments that need to be protected from subsidence on Plate 5-3 or other suitable map.

R645-301-525.110, The applicant must show the location of the permit boundaries for the Lila Canyon project on Plate 5-3.

SLIDES AND OTHER DAMAGE

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

Analysis:

The applicant 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 applicant what additional steps were needed. The applicant committed to report any potential hazards of impoundments that are found during an inspection.

Findings:

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

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discharge permit.

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

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

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

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

Endangered and Threatened Species and Bald and Golden Eagles

The Fish and Wildlife Service has determined that water depletions from the Upper Colorado River Basin may affect four listed threatened or endangered fish species. Mitigation is required when the annual depletion exceeds 100 acre-feet. According to information in the Probable Hydrologic Consequences statement, the total annual water use is expected to be 21.3 acre-feet. Since the mine is not expected to use more than 100 acre-feet, no mitigation should be required.

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.

Section 358.200 contains a commitment to safeguard any escarpment that has been identified as a raptor nest site; however, there is one nest within the subsidence area as shown on Plate 5-3. The

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Division assumes this nest could actually be lost, not just not used. The Fish and Wildlife Service feels the applicant should provide at least two alternative nest sites to replace the nest that could be lost. The application needs to show how this will be done.

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 through any mining or mine-related activity.

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

R645-301-333, The applicant has committed to not subside escarpments that contain eagle nests, but it appears the area near one nest would be subsided. The applicant needs to show how nests in the subsidence areas would be protected or what mitigation will be done. The Fish and Wildlife Service has suggested building alternative nest sites in the area.

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

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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.

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 facilities. Topsoil protection uses traditional methods of salvaging and stockpiling. The plan contains no measures for subsoil protection. The Analysis section discusses operation information as follows:

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

Topsoil and Subsoil Removal

Available Soil Resources

The 1998 Order 1 soil survey, Appendix 2-3, identifies 157,600 cubic yards of available soil for salvage from the 48 acre disturbance, for an average salvage depth of 24 inches. As summarized, soil salvage estimates are broken down according to soil survey map units and are based on the entire disturbance area. Plate 2-3, Soil Salvage and Replacement, shows several undisturbed islands that effectively reduce the disturbance acreage. Section 232.100, Table (Available Soil Resources), identifies a **potential soil salvage** volume of 148,630 cubic yards from a 40.77 acre disturbance area for an average salvage depth of 25.4 inches. The following table summarizes the potential soil salvage volumes as presented in Section 232.100, Table (Available Soil Resources):

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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 generally consists of the A and upper B horizons that have suitable plant growth characteristics. Soil salvage depths of suitable soil material are listed in the following table as compared to rooting depth and subsurface rock content:

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

Topsoil Salvage Practices

State regulations R645-301-232.100 are specific in requiring that all topsoil be removed from the area to be disturbed. Since the A horizon is less than six inches deep, the amendment defines "Topsoil"

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as the suitable soil for plant growth, generally, the upper 6 to 12 inches that consist of both the A and B horizon materials. Therefore, the amendment states that **actual topsoil salvage** will consist of removing the surface layer (true topsoil) averaging about 8 inches thick over the disturbed area and additional portions of subsoil about 10 inches thick and treating the mixture as topsoil. Large stones and boulders are considered part of the soil layer and are included in the topsoil volume estimates. Section 232.100, Table (Available Soil Resources) shows **actual topsoil salvage** as 47,603 cubic yards from 22.56 acres for an average salvage depth of 15.7 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 undisturbed islands within the disturbance area, and on a maximum salvage depth of 18 inches, or down to shale, whichever is less.

Soil salvage volumes and disturbed acreage are in error as discussed in Section 231.400, Table "Available Soil Resource" and on Plate 2-3, Soil Salvage and Replacement. Soil Map Unit XBS, the upper, north portion of the portal access road, is not included in the estimates for topsoil removal and replacement. This area accounts for an additional 0.86 acres with 1,408 cubic yards of soil salvage. After correction, the total volume of topsoil salvage should be 49,011 cubic yards and the total salvage acreage should be 23.43 acres for an average salvage depth of 15.6 inches.

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

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

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

Topsoil salvage will occur under the supervision of a soil scientist to help maximize harvest of quality topsoil. 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. Boulders of approximately three feet in diameter and larger will be separated from the topsoil and piled or placed at appropriate locations. Boulders above ground level are in addition to topsoil volumes and the amendment estimates that they may account for about 10,000 cubic yards.

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Topsoil removal sequence in general would start from the lower elevations of the site and proceed up slope. Surface disturbance may not be required on all of the acreage identified as "Disturbed Area." Plate 2-3, Soil Salvage and Replacement, shows undisturbed islands within the disturbed area where no surface disturbance will occur and where no soil will be salvaged. Concerning protection of undisturbed islands and topsoil resources the following are needed:

- The actual disturbed area boundary needs to be delineated on all applicable maps and on the ground to prevent any accidental disturbance within the undisturbed island areas. The Soils Section shows an actual disturbance area of 22.56 acres (should be 23.43 acres) within the 40.77 acre Disturbed Area Boundary. Although these undisturbed areas are shown on Plate 2-3, they are not shown on other maps within the plan. For example, Surface Facility, Plate 5-2 does not show the undisturbed islands. In addition, Plate 5-2 shows graded land within these undisturbed areas.
- The PAP needs to identify what measures will be made during the life of the mine to protect undisturbed areas containing undisturbed topsoil resources from mining related impacts, such as blowing coal fines, vehicle traffic, and any other mining related impacts that would disturb and/or otherwise negatively impact these undisturbed soil resources. All undisturbed areas need to be marked on all maps. All undisturbed areas need to be marked during construction to avoid disturbance. All undisturbed areas need to be marked during the life of the mine to avoid mining related disturbance. If these undisturbed areas cannot be protected during construction and during the life of the mine, then all soils within the Disturbed Area Boundary need to be salvaged and stockpiled.

Subsoil Segregation and Salvage Practices

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

R645-301-200 states that soil salvage includes both the surface topsoil and subsoils as based on the soil survey and re-vegetation requirements. R645-301-232.500 states that 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.

As established in the Order 1 soil survey, projected subsoil salvage is based on subsoil replacement rooting depth and soil suitability criteria. The amendment states that subsoils 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 also be needed during reclamation to

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reestablish rooting-depth subsoil. Therefore, subsoil resource protection is required for maintaining rooting-depth characteristics. Concerning Soil Map Units SBG, DSH, and VB subsoils which will be used as construction fill, the amendment needs to reference and discuss the following for preserving the subsoil rooting-growth characteristics:

- Identify areas on all applicable maps where subsoils from Soil Map Units SBG, DSH, and VB will be used as fill for construction of pads and other mining related areas.
- Identify the volumes of fill obtained from using subsoils from Soil Map Units SBG, DSH, and VB.
- Identify what measures will be used for protecting these subsoils from deleterious mining related impacts, including contamination from Mancos shale and excessive rocky soils during site construction and grading.
- If sufficient measures can not be given to protect the subsoil rooting-depth growth characteristics, then all suitable subsoils from Soil Map Units SBG, DSH, and VB must be salvaged and stockpiled.

Adverse Conditions

Sections 232.700 and 232.710 state that topsoil can be salvaged on areas to be disturbed. Local exceptions may exist where topsoil can not be salvaged because of rockiness and/or steep slopes in soil units RBL and RBT. The amendment needs to commit that if an area is too steep or rocky for soil salvage, then no construction activities will take place in these areas. If steep slopes are accessible to construction machinery for constructing cutslopes, soils are expected to be salvaged. Either steep, rocky surface slopes are safe for constructing cut slopes and likewise soil salvage, or they're not safe for either activity. If steep, rocky slopes and extremely bouldery surface materials render themselves suitable for constructing purposes using conventional construction equipment, (e.g., cutslopes, sediment pond basins, and pad fill), then these same indigenous soil and rock materials from the unconsolidated steep, rocky surfaces can be salvaged and stockpiled for later reclamation use. Therefore, on steep and extremely bouldery surfaces planned for disturbance, underlying soils are expected to be salvaged.

Rocks - Boulders and Large Stones

Robert Davidson's discussion concerning salvaging soils with higher rock content has been misrepresented in the Appendix 2-3, Section 2.5, Soil Suitability For Salvage. The general idea is to salvage otherwise suitable soil containing indigenous amounts of rock that are typical within the soil salvage area. The main idea is that native soils with a higher intrinsic rock content than Division guideline deems acceptable, offer a greater potential for reclamation success as follows:

- allow a greater potential for moisture infiltration into the interstitial soils
- provide for a more stable reclaimed surface
- provide additional surface cover in sparsely vegetated areas, thus helping protect against rain drop impact and resulting soil surface erosion

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- create wildlife habitat niches
- create micro-climates for plant establishment and vegetation survival.

The PAP appendix 2-3 states that surface stones and boulders in the soil that are present during salvage operations, could be removed to a rock pile on site and held there until replacement. Protection of topsoil resources includes salvaging “**native soils**” with “**intrinsic or indigenous rock content.**” Section 232.100 states that boulders of approximately three feet in diameter and larger will be separated from the topsoil and piled or placed at appropriate locations. Designate a “topsoil” rock stockpile on maps where salvaged rock will be stored for reclamation use.

Topsoil Substitutes and Supplements

Sections 224, 231.200, 232.720, 233, and 233.100 thru 233.400 state that no topsoil borrow nor substitute topsoil is needed.

Refuse Pile

Using R645-100, the rock slope material is by definition Underground Development Waste which is by definition Coal Mine Waste. All Coal Mine Waste must be properly disposed of in a Refuse Pile. A Refuse Pile means a surface deposit of coal mine waste that does not impound water, slurry, or other liquid or semi-liquid material. Underground Development Waste is Defined by R645-100 as waste-rock mixtures of coal, shale, claystone, siltstone, sandstone, limestone, or related materials that are excavated, moved and disposed of from underground workings in connection with Underground Coal Mining and Reclamation Activities. Therefore, the rock slope waste material is identified as Underground Development Waste and disposed of in the Refuse Pile.

Soil salvage volumes do not include the extra soil needed for covering the refuse area with four feet of soil, which will require an additional 30 inches of subsoil in addition to the 18 inches of topsoil. Appendix 5-7 and Table 1 discuss and show the volumes of topsoil and subsoil needed to cover the refuse with 4 feet of material. Since this is not a case of pre-law disturbance without enough suitable soil resources, the plan provides for a minimum of 48 inches of cover using the on site soils.

Topsoil Storage

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

The application, Section 232.100, contains information concerning topsoil pile size and dimensions. Provide engineered drawings of projected stockpiles, showing size, exact placement, final configuration and cross sections for the topsoil stockpile, subsoil stockpile, and “topsoil” rock (boulders and large stones) stockpile.

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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:

R645-301-120 and R645-301-232.100, Correct soil salvage volumes and disturbed acreage in Section 231.400, Table "Available Soil Resource" and on Plate 2-3, Soil Salvage and Replacement. Soil Map Unit XBS, the upper, north portion of the portal access road, is not included in the estimates for topsoil removal and replacement. This area accounts for an additional 0.86 acres with 1,408 cubic yards of soil salvage. After correction, the total volume of topsoil salvage should be 49,011 cubic yards and the total salvage acreage should be 23.43 acres for an average salvage depth of 15.6 inches.

R645-301-232.500 and R645-301-234.300 through R645-301-234.320, Concerning Soil Map Units SBG, DSH, and VB subsoils which will be used as construction fill, the amendment needs to reference and discuss the following for preserving the subsoil rooting-depth growth characteristics: 1.) Identify areas on all applicable maps where subsoils from Soil Map Units SBG, DSH, and VB will be used as fill for construction of pads and other mining related areas, 2.) Identify the volumes of fill obtained from using subsoils from Soil Map Units SBG, DSH, and VB. 3.) Identify what measures will be used for protecting these subsoils from deleterious mining related impacts, including contamination from Mancos shale and excessive rocky soils during site construction and grading. If sufficient measures can not be given to protect the subsoil rooting-depth growth characteristics, then all suitable subsoils from Soil Map Units SBG, DSH, and VB must be salvaged and stockpiled.

R645-301-121.200, R645-301-521.162 and R645-301-521.250, To prevent any accidental disturbance within the undisturbed areas, (as shown on Plate 2-3) within the Disturbed Area Boundary, provide the following: Delineate actual disturbed area boundaries within the Disturbed Area Boundary on all applicable plates and maps, Commit and correlate between chapters, that all undisturbed areas within the Disturbed Area Boundary will be appropriately signed and marked on the ground during construction activities and during mine operations.

R645-301-333, Identify what measures will be made during the life of the mine to protect the undisturbed island areas from mining related impacts, such as blowing coal fines, vehicle traffic, and other uses that would disturb and/or otherwise negatively impact the undisturbed vegetation and topsoil resources.

R645-301-232.700 and R645-301-232.710, If steep, rocky slopes and extremely bouldery surface materials render themselves suitable for constructing purposes using conventional construction equipment, (e.g., cutslopes, sediment pond basins, and

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pad fill) then these same indigenous soil and rock materials from the unconsolidated steep, rocky surfaces can be salvaged and stockpiled for later reclamation use. Provide the following: 1.) On steep and extremely bouldery surfaces planned for disturbance, underlying soils are expected to be salvaged. 2.) Commit that if an area is too steep or rocky for soil salvage, then no construction activities will take place within these areas of the Disturbed Area Boundary, 3.) Identify specific areas inaccessible for construction machinery due to adverse, unsafe or impractical conditions.

R645-301-234.100, R645-301-521.160 and R645-301-521.165, Provide the following:

1.) Designate a "topsoil rock stockpile" on maps where salvaged rock will be stored for reclamation use, and sign these piles accordingly during the life of the mine. 2.) Provide engineered drawings of projected stockpiles, showing size, exact placement, final configuration and cross sections for the topsoil stockpile, subsoil stockpile, and "topsoil" rock (boulders and large stones) stockpile.

INTERIM REVEGETATION

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

Analysis:

Section 331 says the permit area is approximately 40.77 acres of which only 39.86 acres will be disturbed drainage area. The permit area would be the entire area proposed to be mined, not just the disturbed area, so these acreage figures are not correct.

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 the species in the seed mix should be adequate for interim revegetation, the Division recommends adding one or two species of rhizomatous grasses, such as western wheatgrass and thickspike wheatgrass.

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

R645-301-331, Correct the mistake in Section 331, the application says the permit area would be 40.77 acres.

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ROAD SYSTEMS AND OTHER TRANSPORTATION FACILITIES

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

Analysis:

Road Systems

Road Classification System

The applicant 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

- (1) In Section 527.200 of the amendment the applicant 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 applicant states that a slope stability analysis was done for the road embankment and road cut slope.

The applicant used the Hoek method for calculating slope stability factors. The stability analysis shows that the road embankment and cut slope are stable.

Appendix 5-4 has a drawing labeled "Typical road section." The drawing is an enlargement of part of the area identified as 12+00 to 20+00 on Plate 5-2.

- (2) The applicant does not propose to locate a road in the channel of an intermittent or perennial stream.
- (3) The applicant does not propose to locate a temporary ford in the channel of an intermittent or perennial stream.
- (4) The applicant does not propose to alter or relocate a natural stream channel.
- (5) The applicant does not propose a low-water crossing of a perennial or intermittent stream channel.
- (6) The applicant 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.

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Performance Standards

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

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

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

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Coal Mine Waste

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

Figure 1 in Appendix 5-7 shows two disposal areas for coal mine waste. They are called the refuse pile and slope rock and refuse storage area, and the refuse pile. The refuse pile is not shown on any other maps or plates. The applicant needs to clarify if the refuse pile shown on Figure 1 in Appendix 5-7 will be part of the mine.

On Page 67 of the November 29, 1999 submittal the applicant states that sandstone from the slope tunnels could be crushed and used for gravel. The sandstone has been classified as coal mine waste and can only be disposed in an approved refuse site. The applicant needs to clarify where that material will be placed.

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

- Minimize adverse effects of leachate and surface-water runoff on surface and groundwater quality and quantity.
- Ensure mass stability and prevent mass movement during and after construction. The applicant proposes to place the material in lifts not to exceed 24" in height. The refuse pile will be compacted to 90% of maximum dry density.
- Ensure that the final disposal facility is suitable for reclamation and revegetation compatible with the natural surroundings and the approved postmining land use. The plan calls for placing 30" of subsoil and 18" of top soil on the pile. That cover amount is usually considered adequate to meet vegetation requirements.
- Not create a public hazard. The Division will inspect the disposal site during construction, operation and reclamation. If the facility becomes a public hazard, the Division will take action.
- Prevent combustion. The material will be placed in layers not to exceed 24" in height and will be compacted. Those procedures should prevent combustion.

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

The coal mine waste disposal facility must have a static safety factor of at least 1.5. The slope stability analysis for the refuse pile is shown in Appendix 5-5. The applicant used the stability graphs from Rock Slope Engineer by E. Hoek and J.W. Bray to calculate the safety factor. The applicant calculated the safety factor to be 2.90 for dry conditions and 1.98 for saturated conditions.

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On Page 228 of *Rock Slope Engineer* the assumptions used to calculate the failure charts are given. The first assumption is that the material forming the slope is homogeneous. On Page 19 of the response the applicant states that they assumed the material to be homogeneous. The Division does have concerns about this assumption. At least 6 different materials will be used to construct the coal mine waste facility. They are the native soil that will be used as the foundation, the waste rock material, the coal development waste, the coal processing waste, the subsoil and the topsoil. Those materials may not have the same physical properties. For example crushed rock usually does not have an internal angle of friction while soils do.

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 applicant 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 applicant committed to having the refuse pile inspected as stated in the R645 rules.

Impounding Structures

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

Excess Spoil

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

Findings:

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

R645-301-121.200, The applicant must be clear, concise and consistent with the name used to refer to the disposal area for coal mine waste. The applicant refers to the

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area by several names such as the rock/coal waste storage areas, rock slope/coal waste storage areas, the pad and refuse pile. The applicant should avoid using terms to describe the coal mine waste that are not defined in the R645 rules. Those materials should be called coal mine waste, coal processing waste or underground development waste.

R645-301-121.200, The applicant must be clear, concise and consistent when stating that sandstone from the tunnels will be used for gravel. The applicant must clarify that statement stating where the gravel will be used. The gravel from the tunnels cannot be placed outside the approved refuse pile.

R645-301-121.200 and R645-528.332, The applicant must clarify if the refuse pile shown on Plate 1 of Appendix 5-7 will be part of the mine. If not the refuse pile must be removed from the map.

R645-301-528.332, The applicant needs to show the location of the on site concrete disposal areas and describe how the concrete will be placed and covered. If the applicant intends to dispose of noncoal mine waste in an area that is not a state approved facility then they must submit designs to show that no leachate will enter the groundwater or surface water.

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

HYDROLOGIC INFORMATION

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

Analysis:

Ground-water Monitoring

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

Operational ground-water monitoring sites are listed in Table 7-3 and locations are shown on Plate 7-4. Six seeps and spring ground-water monitoring sites, L-6-G through L-11-G, are proposed: they will be monitored quarterly for parameters listed in Table 7-5. 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.

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A-26 and A-31 were bored as offsets to S-26 and S-31 to observe ground-water levels in the alluvium south of the Williams Draw Fault. Table VI-3 does not indicate that these wells have been plugged and abandoned; however, the applicant has no data on A-26 and A-31 (Section 6.5.1 - p. 21).

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 applicant 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 applicant states that other than the log there are no other geologic or piezometric data from S-32 (Section 6.5.1). The applicant considers A-26, A-31, and S-32 unusable (Section 724.100).

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 applicant 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; this appears to be a reference to Sections R645-301-145 and -731 of the Coal Mining Rules.

Ground-water monitoring will continue through mining and reclamation until bond release. 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 applicant 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 and will be removed by the operator when no longer needed.

The applicant'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 applicant 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).

Surface-water Monitoring

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

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Streams will be monitored monthly. Sediment pond and mine discharges will be monitored monthly or as frequently as discharges occur.

Point-source discharge monitoring will be conducted in accordance with 40 CFR Parts 122 and 123, R645-301-751 and as required by the Utah Division of Environmental Health for Utah Pollutant Discharge Elimination System (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.

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. Operational ground- and surface-water monitoring will be implemented upon approval of the plan.

The applicant 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 applicant 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:

- (1) Minimizing surface disturbance and proper handling of earth materials to minimize acidic, toxic or other harmful infiltration to ground-water systems;
- (2) Testing (as-necessary) to ensure stockpiled materials are non-acid and non-toxic;
- (3) Controlling and treating disturbed area runoff to prevent discharge of pollutants into surface-water, by the use of diversions, culverts, silt fences, sediment ponds, and by chemical treatment if necessary;
- (4) Minimizing and/or treating mine water discharge to comply with UPDES discharge standards;
- (5) 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;
- (6) Proper handling of potentially harmful materials (such as fuels, grease, oil, etc.) in accordance with an approved Spill Prevention Control and Countermeasure Plan (SPCC).

Acid and Toxic-forming Materials

Drainage from acid- and toxic-forming materials and underground development waste into surface water and ground water will be avoided by implementation of a Spill Prevention Control and

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Countermeasure (SPCC) Plan and by the following:

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

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

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

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

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

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

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

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Gravity Discharges

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

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

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%, 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 small.

Surface entries and accesses of drift mines are to be located so as to prevent or control gravity discharge from the mine. The cross section on Figure 7-1 shows the relationship of the rock tunnels to structure, stratigraphy, and ground water.

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 therefore gravity discharge from the surface entries of the mine is also unlikely.

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.

Diversions

There is one undisturbed diversion planned for this site within the permit area. . 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 applicant has proposed to install a 60 inch culvert. The existing culvert in the old road will have to excavated and removed.

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Other diversions planned consist of disturbed area ditches and culverts, as shown on Plate 7-5. Design details for all diversions are provided in Appendix 7-4.

All diversions will be constructed and maintained to comply with the requirements of R645-301-742.100 and R645-301-742.300. Details are described under those respective sections of this chapter.

Culvert details are provided in Appendix 7-4. All undisturbed culvert inlets will be provided with headwall protection, consisting of inlet sections, rock or concrete.

Stream Buffer Zones

No development or disturbance will take place within 100 feet of a perennial stream. The only perennial stream identified by the applicant 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.

Undisturbed diversions will consist of properly designed and protected channels and/or culverts as described in Appendix 7-4.

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

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 the following regulations.

Sedimentation Ponds

The general plan for this site is to drain runoff from the disturbed area into a single sedimentation pond for treatment prior to discharge. Site drainage and design details are described in Appendix 7-4. The general plan includes the following, at a minimum:

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

Sediment pond locations, design plans and cross sections are provided on Plates 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;

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 protected from erosion by the use of adequately sized rip-rap, concrete or other approved protection. Details for outlet protection for all drainage control structures are provided in appendix 7-4. All discharge structures have been designed according to standard engineering design procedures.

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;

Meet the effluent limitations under R645-301-751.

Exemptions for Siltation Structures

No exemptions requested by the applicant.

Discharge Structures

The Principle Spillway culvert is a corrugated, metal pipe, and the open channel spillway is proposed to be constructed of grouted rip-rap. Each one designed to carry sustained flows.

The sediment pond emergency spillway will be constructed of grouted rip-rap for erosion and velocity control. (See Appendix 7-4).

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

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Impoundments

- (1) The applicant proposes to construct only one sediment pond that will be in the southeast corner of the disturbed area (See Plate 5-2). The sediment pond will have a maximum storage capacity of 12 acre feet and a height of 11 feet. Therefore, the pond does not meet the criteria for an MSHA pond.
- (2) The applicant had the sediment pond design certified by Dan Guy, who is a registered professional engineer.
- (3) In Appendix 5-5 the applicant 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.
- (4) The applicant did include the analysis of the physical and engineering properties of the foundation materials.
- (5) The applicant states in Appendix 5-5 that the pond is protected against sudden drawdown. The applicant 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 applicant must supply the Division with additional information about how the pond is protected against sudden drawdown. See R645-301-533.300.
- (6) The applicant states that the pond design was approved by the State Engineers Office. The applicant must give the Division a copy of the State Engineers' approval letter. See R645-301-521.190.
- (7) The applicant committed to have the external slopes of the impoundment planted with an approved seed mix to help prevent erosion and promote stability.
- (8) There are no highwalls associated with the impoundment.
- (9) The applicant committed to conduct inspections as stated in the Utah Coal Rules.

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). One well is identified on the site, but is not used.

Findings:

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

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with:

R645-301-533.100, The applicant should submit information on Plate 7-6 which details the outslope embankments, slope and size of culvert, UD-6, beneath pond, roadway width and slope, locations and design of trash-racks, locations and design of discharge pads, emergency spillway design, path of emergency discharge, sediment cleanout marks and topographic relationship of sediment pond to undisturbed channel using scale of 1 foot intervals.

R645-301-533.700, The applicant must label the contour lines on Plate 7-6. The applicant must also show the correct location of the emergency spillway on the contour maps. The elevation of the emergency spillway is shown between 5839 and 5841 feet on Plate 7-6. The table shows the elevation to be 5841 feet.

R645-301-533.300, The applicant must show how the pond will be protected against sudden drawdown. Specifically the applicant must show that pore pressure in the embankments will not cause the pond to fail should a sudden drawdown occur.

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

SUPPORT FACILITIES AND UTILITY INSTALLATIONS

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

Analysis:

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

Findings:

The applicant has met the minimum requirements of this regulation.

SIGNS AND MARKERS

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

Analysis:

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

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Findings:

The applicant 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 applicant to submit a specific blasting plan separate from the MRP. The applicant has opted to submit a detailed blasting plan later.

Findings:

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

Plate 5-2 shows the mine facilities.

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.

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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. 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. 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. Seven seeps and spring ground-water monitoring sites, L-6-G through L-11-G, are proposed: they will be monitored quarterly. Water levels will be measured quarterly in wells IPA 1, 2, and 3.

The relationship of these springs to seeps and springs monitored previously by JBR Consultants, EarthFax Engineering, and others is not always clear. The names do not correspond to those used in gathering earlier data, and locations on Plate 7-4 do not clearly correspond with locations on Plate 7-1. Deficiencies in the Monitoring and Sampling Location Maps are identified under Maps, Plans, and Cross Sections in the Resource Information section of this TA and are not repeated here.

Findings:

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

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

R645-301-521, The applicant must be consistent with showing the disturbed area boundaries. On Plate 5-2 the applicant shows that all land within the disturbed area boundary is disturbed. On Plate 2-3 the applicant shows 3 undisturbed areas within the disturbed area boundaries. If the applicant intends to have undisturbed islands with the disturbed area boundary then the island must be marked. The applicant cannot use the disturbed area boundaries for mining or reclamation without amending the permit.

R645-301-521, The applicant should submit detailed designs showing size slope and height of all features of the sedimentation pond and adjacent area, see deficiencies under Operation Plan. Plates 7-5 and 7-2 show a "Refuse Pile" location above drainage DD-4, this has to be corrected. All the culverts are not identified on Plate 7-2. Their size and length should be stated.

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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 use 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.

PROTECTION OF FISH, WILDLIFE, AND RELATED ENVIRONMENTAL VALUES

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

Analysis:

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.

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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 in the application is 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, -301-533, -301-553, -301-536, -301-542, -301-731, -301-732, -301-733, -301-764.

Analysis:

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

Findings:

The applicant has not met the minimum requirements of this section. Areas under hydrology have to be addressed.

BACKFILLING AND GRADING

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

Analysis:

In Section 537.200 the applicant states:

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

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

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

A profile of one reclaimed highwall is shown on Plate 5-7C. However, the specific portal is not identified. The applicant needs to give the Division profiles for all three portals.

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

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

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

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

Findings:

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

R645-301-553.120, In Section 553.120 the applicant must give the Division detailed maps and cross sections of the portal areas. Without that information the Division cannot make a finding about the adequacy of the highwall elimination plan. The Division needs a cross section of profile of each portal. The portals must be identified on the cross sections. Note: by definition a highwall will be created as part of the portal. See analysis section for more details.

R645-301-553.130, In Section 553.130 the applicant states that all reclaimed slopes will

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have a static safety factor of at least 1.3. The applicant did not provide the slope stability analysis that supports the 1.3 safety factor claims for the reclaimed slopes. The Division did not receive that information.

R645-301-121.100, The applicant must remove the references in Appendix 5-5 to the refuse pile removed from the original mine plan. That information is no longer needed and can confuse the reader.

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

MINE OPENINGS

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

Analysis:

The applicant 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 applicant met the minimum requirements of this section.

TOPSOIL AND SUBSOIL

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

Analysis:

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

- Soil Redistribution
- Soil Nutrients and Amendments
- Soil Stabilization

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Soil Redistribution

Section 240, Reclamation Plan, describes the steps taken for reclamation. Reclamation will begin once all surface facilities and structures have been demolished and removed. Disturbed areas will be restored to approximate original contour (AOC) using pad material. Subsoil from Soil Map Units SBJ, DSH, and VBJ used as construction fill need to be identified and used appropriately during reclamation as root zone subsoils within these areas as follows:

- Identify what pad and mine areas containing subsoil will be graded to AOC.
- Identify methods for insuring that subsoil “construction fills” are used appropriately as root zone soils.
- Identify what measures will be used to ensure that graded subsoils are not contaminated from less desirable fills and materials (e.g., Mancos, shale, and excessive rock).

Section 241 states that after AOC is achieved, the disturbed surface will be scarified where practical, prior to soil redistribution. The rippers found on the rear of a dozer will be used to “scarify” the disturbed surface. Ripping will be on a minimum of 6 feet spacing.

Soil replacement volumes are shown in the following table. Soil replacement includes topsoil placement and 4 feet of soil cover over the refuse area.

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.

^ Does not include the 18 inch topsoil placement.

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

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Section 242.100 states: "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." On flat areas, soil will be reapplied using road grader and/or crawler tractor. On steep slope areas, soil will be reapplied using a front-end loader, crawler tractor, and/or trackhoe. Boulders will be replaced to achieve a near natural surface condition. Alleviating or minimizing soil compaction is not discussed. The following are needed:

- Clarify and describe what is meant by "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."
- Describe methods for minimizing and alleviating compaction of fill and replaced subsoil and topsoil.
- A plan for the reincorporation of stockpiled rock (boulders and large stones) with the redistributed topsoil.

Soil Nutrients and Amendments

Section 241 states that an inoculum will be applied to the soil to help assist in reactivating and regenerating soil activity for soil organisms, bacteria, microhorizae, and mycelia. 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. Major nutrients include nitrogen, phosphorus and potassium content. Grab samples will be collected from the stockpile at various locations and depths. Fertilizer, if needed, will be applied to the topsoil prior to seeding and mulching activities. Sampling will either be performed by a Certified Soil Scientist, or by a person qualified by the operator and the Division of Oil, Gas and Mining.

Soil Stabilization

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

Section 244.200 states that pocking will be the primary method used to roughen the soil surface as per Figure 1 in Appendix 5-8. In addition, wood fiber mulch will be applied at a rate of 2,000 pounds per acre to the reclaimed areas that have been graded and covered by topsoil or substitute topsoil. The wood fiber mulch will be tacked to the surface with a tackifier. The tackifier will be applied at a rate of 50 pounds per acre.

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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 R645-301-234.300 through R645-301-234.320, 1.) Identify areas where subsoil from Soil Map Units SBJ, DSH, and VBJ was used as construction fills. 2.) Replace subsoil "construction fill" during reclamation as root zone subsoils. 3.) Identify pad and mine areas containing subsoil "construction fills" that will be graded to AOC. 4.) Identify methods to ensure that subsoil "construction fills" are used appropriately as root zone soils. 5.) Identify measures to ensure that graded subsoils are not contaminated with less desirable fills and materials (e.g., Mancos, shale, and excessive rock) during regrading AOC activities.

R645-301-121.100, Clarify and describe what is meant by the following statement used in Section 242.100: "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."

R645-301-242 through R645-301-242.200, Concerning soil and rock replacement, provide the following: 1.) Describe methods for minimizing and alleviating compaction of fill and replaced subsoil and topsoil. 2.) Describe how stockpiled "topsoil" rock (boulders and large stones) will be placed on the surface and reincorporated with the redistributed topsoil. 3.) Correct the plan to indicate surface preparation practices that are compatible with the rocky soil and surfaces, and that are consistent with other reclamation practices (e.g., pocking). Drilling, discing or raking are not compatible with extreme rocky soils, rocky surfaces, or with surfaces that have been deep gouged or pocked.

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 applicant 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 applicant met the minimum requirements of this section.

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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 U.P.D.E.S. 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 applicant 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).

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

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entries of the mine is also unlikely.

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.

Stream Buffer Zones

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

Sediment Control Measures

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

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

Siltation Structures

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

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

Sedimentation Ponds

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

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

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

Discharge Structures

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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).

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

Findings:

Reclamation hydrologic information that has been reviewed is considered not adequate to meet the requirements of this section.

R645-301-521, The surface reclamation map should show reclamation contours of the sedimentation pond and culvert UD-6 in place and removed.

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:**Timing**

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

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The Division is willing to accept the plan to seed in the fall, but the applicant needs to at least try seeding in the summer on an experimental basis. To do this, the applicant could establish traditional test plots or could simply show an area of the mine where summer seeding could be tried for blue grama and galleta. The interim and final revegetation seed mixes are essentially the same; therefore, it is possible for the applicant to try the different seeding times for blue grama and galleta in some areas of the mine that will receive interim revegetation treatments. These areas should be monitored, and if the different seeding time was successful, the reclamation plan should be modified accordingly.

Mulching, Seeding, and Other Soil Stabilizing Practices

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

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

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

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

According to Section 553.230, surface preparation will include pock marking to minimize the potential for erosion and to enhance vegetation establishment. Because of the limited precipitation, the Division considers surface roughening to be essential at this site. Figure 1 in Appendix 5-8 is diagrams of pock mark configurations.

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

The seed mixture for final reclamation is shown in Table 3.4/3.5. It consists of 22 species, 19 of which are native to the area. The introduced species are yellow sweet clover, alfalfa, and prostrate kochia.

The application includes justification for including yellow sweet clover. There is controversy whether this species should be included for revegetation, but the applicant would apply it at a rate of only 0.5 pounds per acre for broadcast seeding and half this rate for drilling. At this rate, it should not dominate the site or spread to adjacent areas. The application says yellow sweet clover has proven

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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.

The application needs to include justification for the other two introduced species such as in the following discussion. R645-301-353.120 says reestablished vegetation will be comprised of species native to the area, or of introduced species where desirable and necessary to achieve the approved postmining land use and approved by the Division. Alfalfa was recommended by the Division of Wildlife Resources, and because this site is marginal for alfalfa, it should not be overly aggressive. There is evidence forage kochia competes well with downy brome, a weed that dominates much of the proposed disturbed area.

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

Appendix 5-8 says seedlings will be planted at a rate of 200 per acre and gives planting specifications. It says the ratios and species will be determined by the Bureau of Land Management and the Division. The Division does not determine ratios and species for planting although it can make recommendations. The application gives adequate details of when and how seedlings would be planted, but if the applicant intends to plant seedlings, the plan needs to show what would be planted at what rates and where.

Section 241 says seed will be hand broadcast and raked or applied with a hydroseeder. Chapter 3 discusses using a rangeland drill but also includes the option of broadcasting the seed. The applicant needs to correct this discrepancy between the two chapters. Drill seeding is likely to decrease surface roughness and should be avoided.

According to Chapter 3, straw mulch will be applied by hand or with a straw blower at a rate of 2000 pounds per acre on all inaccessible areas. The mulch will be anchored by crimping using discs traversing the mulched area. Accessible areas will be hydromulched. Chapter 2 does not discuss using straw, so the two chapters are inconsistent. Also, the tackifier rates are different in the two chapters.

The Division prefers straw mulch on inaccessible areas not be crimped rather than crimping it and decreasing surface roughness. Some mulch would blow away, but some would be caught in gouges. The Division feels it is more important to have gouges than to anchor the mulch.

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. Unless medusahead rye is present, 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 applicant 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.

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Standards for Success

The reference area for the mine site disturbance was established adjacent to the proposed facilities during the summer of 1999, and the application refers to Plate 3-1. Plate 3-1 shows wildlife habitats in the general area and does not show the reference area; however, Figure 1 in the report for the 1999 vegetation survey shows the reference area location. The reference in the application to Plate 3-1 should be corrected.

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

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

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

Section 341.250 discusses success standards for diversity, seasonality, and erosion control. As understood by the Division, the standard for diversity is acceptable, but it must be clarified and may not be what the applicant intends. (It is possible the Division does not understand the applicant's intended standard and that the standard is not acceptable.) The Division understands that each species with at least 20% frequency would be classified by life form, such as grass, broadleaf forb, and shrub. The reclaimed area would need to reflect a 70% similarity of composition by group. The Division understands this to mean that, for example, if flowering saltbush, sagebrush, shadscale, and winterfat were all in the reference area with a frequency of at least 20%, the reclaimed area would need to have at least 70% of these species with 20% frequency, (3 species = 75% in the example).

The problem with a standard like this is that it requires the same species, i.e. composition, in both the reclaimed and reference areas. The reclaimed area may have more desirable species than the reference area but not meet the standard because the species are not the same.

If the applicant intends to keep this standard, it must be clarified so there is no confusion about it. Also, the applicant needs to define the life form categories. Assuming "undesirable species" is one of these categories, this category needs to be clearly defined.

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The Division suggests the standard be modified. Every species with more than 20% relative cover could be classified into a life form. The standard would be 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. Possible life form categories would be shrubs, trees, broadleaf forbs, grasses, introduced species, and undesirable species. For seasonality, the life form categories would simply be warm and cool season.

The proposed erosion standard is that vegetation will have demonstrated its erosion control effectiveness when UPDES effluent standards are met. This standard is generally acceptable, but compliance and erosion control would need to be demonstrated with a trend rather than just a few samples. Samples would need to be taken at every drainage leading away from the reclaimed area. The application needs to contain these commitments.

Field Trials

The application says the methods outlined have a proven performance based on the successful reclamation of the Horse Canyon Mine.

The applicant intends to plant all species in the seed mixture in the fall, but the Office of Surface Mining has recommended that warm season species, such as blue grama and galleta, be planted in the summer to take advantage of late summer rains. The applicant needs to try seeding these species in the summer on part of the area that will have interim revegetation. The rest of the species would be seeded in the fall, and this treatment could be compared to areas that are only seeded in the fall.

Findings:

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

R645-301-341.300, R645-301-354, The revegetation plan shows two warm season species being planted in the fall where experience in other states indicates these species could be best established by planting them in the summer. To test whether summer or fall seeding is best, the applicant needs to designate at least one area of the mine where interim vegetation would be established and plant blue grama and galleta in the summer. This treatment could be compared to fall seeding. The application needs to show where this would be done and discuss how the site would be monitored.

R645-301-341.250, The application needs to demonstrate that the introduced species proposed for use in the plan for final reclamation are desirable and necessary for achieving the postmining land use.

R645-301.341.210, Appendix 5-8 says the ratios and species of seedlings will be determined by the Bureau of Land Management and the Division, but the Division does not determine ratios and species for planting although it can make

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recommendations. If the applicant intends to plant seedlings, the plan needs to show what would be planted at what rates and where.

R645-301-341.220, Chapter 2 says seed will be broadcast, but Chapter 3 indicates it will be either broadcast or drilled. The applicant needs to correct this discrepancy. Drill seeding is likely to reduce surface roughening, and this method should not be used.

R645-301-341.230, Chapters 2 only discusses hydromulching, but Chapter 3 says inaccessible areas will be mulched with straw. This inconsistency needs to be resolved. The straw mulching plan includes crimping the straw, and this would tend to decrease surface roughness. The Division would rather the straw not be anchored than to use a method that would decrease the amount of roughness.

R645-301-323, The application says the revegetation reference area is shown on Plate 3-1, but this statement needs to be corrected. The reference area is shown on Figure 1 of the report for the 1999 vegetation inventory.

R645-301-341.250, The applicant needs to clarify the success standards for seasonality and diversity.

R645-301-341.250, The proposed success standard for erosion control is generally acceptable, but the applicant needs to commit to demonstrate compliance with several samples showing a trend, and every drainage leading away from the disturbed area must be included in the sampling regimen.

CESSATION OF OPERATIONS

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

Analysis:

The applicant 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 applicant will notify the Division. After permanent cessation the applicant committed to remove all equipment and surface structures.

Findings:

The applicant 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.

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

Reclamation Treatments Maps

Findings:

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

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with:

R645-301-542, The applicant 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 Division will not review this section until the reclamation plan has been approved.

Terms and Conditions for Liability Insurance

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

Findings:

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

SPECIAL CATEGORIES OF MINING

**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 applicant 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 applicant has submitted sufficient information for this section.

SPECIAL CATEGORIES OF MINING

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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 applicant 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 applicant has submitted sufficient information for this section.

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

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

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

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