

March 7, 2003

TO: Internal File

FROM: Priscilla Burton, Reclamation Specialist (Soils) and Team Lead

RE: Lila Canyon Extension, Horse Canyon Mine, Utah American Energy, Inc.
007013-PM02B-2.

SUMMARY:

The Division received an application to include the Lila Canyon Mine area into the Horse Canyon Mine permit on February 11, 2002. The first review of the submittal resulted in a list of deficiencies dated March 26, 2002. The Permittee's response was received April 25, 2002. The second technical Analysis was dated July 19, 2002 and a response was received December 6, 2002.

This technical memo reviews the information received to date from the Permittee, letters of comment from the public, and the Informal Conference requested by the Southern Utah Wilderness Alliance (SUWA) on May 21, 2002.

TECHNICAL ANALYSIS:

GENERAL CONTENTS

PUBLIC NOTICE AND COMMENT

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

Analysis:

The U.S.D.I. Bureau of Land Management and the U.S.D.I. Office of Surface Mining published an Environmental Assessment of the Lila Canyon Project (EA No UT-070-99-22) in July 2000. The Division received the Permit Application Package on February 11, 2002.

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Public notice of the Permit Application Package was placed in the Emery County Progress on February 28, March 7, 14 and 21, 2002. A copy of the newspaper advertisement has been made part of the Mining and Reclamation Plan in Appendix 1.5. In accordance with R645-300-121.100 *et seq*, the notice identifies the name and business address of the applicant; provides a map showing the Horse Canyon Mine permit area and the adjacent boundaries of the proposed Lila Canyon extension permit area and identifies the boundaries using Township and Range and Section; and provides three locations for public inspection of the PAP; and gives the name and address of the Division. Also included in the public notice is a concise statement describing the application as an extension to the existing Horse Canyon Mine to be known as Part B Lila Canyon extension, to be processed as a new permit.

During an informal hearing, SUWA commented on the adequacy of the public notice, in particular, questioning the link between the Horse Canyon Mine permit and Part B: Lila Canyon extension. The Division maintains that reviewing the application for Part B: Lila Canyon extension as a new permit follows the requirements of R645-303-222.

Written comments were received from six concerned citizens and two organizations within thirty days of the last publication date of the public notice. The two organizations providing comment were the Southeastern Utah Association of Local Governments (SUALG) and the Southern Utah Wilderness Alliance (SUWA).

An Informal Hearing was requested by SUWA and was held on May 21, 2002 at the Division Office in Salt Lake City. The comments made during the hearing are part of the public record and are referred to throughout this Technical Analysis of the mine permit application package (PAP).

Not included in the public notice was notification of mining within 100 feet of the outside right-of-way a public road (R645-300-121.150).

Findings:

The Permittee has not met the requirements of the Regulations for Public Notice. Prior to approval and in accordance with,

R645-300-121.150, The Permittee must provide public notice of the intention to conduct mining within 100 feet of the outside right-of-way of the public roads and timing and duration of closure during installation of a culvert in the existing public road

REPORTING OF TECHNICAL DATA

Regulatory Reference: 30 CFR 777.13; R645-301-130.

Analysis:

An Order I Soil Survey was conducted of the proposed Lila Canyon extension disturbed area was conducted in August 1998 by Dan Larsen, Soil Scientist, Environmental Industrial Services, Inc., Helper, Utah.

Findings:

Information provided in the application does not meet the minimum Technical Data Reporting requirements of the Regulations. Prior to approval, the Permittee must provide the following in accordance with:

R645-301-130, Include in PAP the qualifications of the consulting soil scientist.

ENVIRONMENTAL RESOURCE INFORMATION

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

GENERAL

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

Analysis:

The Horse Canyon Mine is in the Book Cliffs coalfield in Emery County near East Carbon and Sunnyside, Utah. The topography of Horse Canyon and Lila Canyon are shown on the Cedar and Lila Point 7.5 Minute Quad maps, produced by the Geological Survey of the U.S. Department of the Interior, 1985.

In its location on the western slope of the vast and largely undeveloped Tavaputs Plateau, the proposed area of development includes some areas that are designated as Wilderness Study Areas and some designated as Wilderness Inventory Areas. The proposed Lila Canyon portal site lies just five miles from State Highway 6 and is immediately adjacent to an "unimproved" road (Plate 1-1).

The existing Mining and Reclamation Plan (MRP) for Horse Canyon is referred to as Part A and the application for Lila Canyon Extension is referred to as Part B. The permit area for Horse Canyon Part A is 1,327.75 acres and the proposed permit area for Lila Canyon Extension

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Part B is 4,664.32 acres. The combination of Horse Canyon Part A and Lila Canyon Extension Part B would bring the total new permit area to 5,992.07 acres.

The Lila Canyon Extension (Part B) site has a southwest aspect at the base of the Book Cliffs. The pediments are composed of sandstone over shale with a prevalence of cobbles, stones and boulders. It is an erosional environment. The soil receives protection from surface rocks, vegetation and biologic soil crusts.

Salt desert shrub and juniper are the predominant vegetative communities.

Findings:

The information provided is adequate for the purposes of the regulations.

PERMIT AREA

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

Analysis:

The permit area of 5,992.07 acres is shown on Plate 1-1 and Plate 5-4. The permit boundaries are divided into Part A, the Horse Canyon project, and Part B, the Lila Canyon Extension.

The Permit Area is reported on page 12 of the PAP as **5,992.07 acres** [for both Part A (Horse Canyon) and Part B (Lila Canyon)]. As explained on page 12 of the PAP, this figure does not match the **5,544.01 acres** listed on page 9 and in Table 1-1 for federal acres within the permit area, because the **5,992.07** figure includes surface acreage within the permit area that is not included in the federal leases. Table 4-2 breaks out the private, state and federal acreage within Parts A and B of the permit area. Table 4-2A breaks out the private, state and federal acres of coal ownership within Parts A and B of the permit area. There are six federal leases in the permit area. NOTE: Both Tables 4-2 and 4-2A differentiate between Horse Canyon and Lila Canyon, but for permitting purposes, the Tables would do better to discuss Part A and Part B of the Horse Canyon Mine.

The mine site is located in T.16S, R.14 E, Section 15, SE 1/4 SW 1/4. The proposed mine site is located upon an alluvial/colluvial bench at an elevation of 5,800 to 6,500 feet where the two forks of Lila Canyon converge. Page 12 of Chapter 1 indicates that of the **40.77 acres** within the disturbed area boundary, only 25.06 acres will actually be disturbed. Chapter 2, page 10 indicates that only **25 acres** of topsoil will be salvaged. Plates 1-2, 5-1 and 5-2 show islands of “undisturbance.”

What seems to be in contradiction to this concept of limiting the disturbance to twenty five acres is the statement in the plan indicateing that the **40.77 acres** within the disturbed area are divided as follows: the pad, silos, coal processing structures, and parking total 37.37 acres and the roads and portal pads add 3.4 acres more (p90 Section 542.200 and p1 of Appendix 5-8). If only 25 acres are to be disturbed, then the pads silos coal processing structures and parking, roads and portal pads can not add up to 40.77 acres.

All sections of the PAP must be consistent in the description of the disturbed area boundary.

Findings:

The disturbed acreage must be clearly stated in the narrative. Prior to approval, in accordance with:

R645-301-116.100, The Permittee must clearly state the anticipated number of acres of surface disturbance to be affected during the life of the mine and statements of the number of disturbed acres must be consistent within the PAP.

CLIMATOLOGICAL RESOURCE INFORMATION

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

Analysis:

The proposed mine site is in an area that receives an average annual precipitation of approximately 14 inches. The Permittee indicates an average annual precipitation as high as 13.69 inches: the information was downloaded from the Western Regional Climate Center and is shown in Table 7-1A in Section 724.413. Table 7-1A shows the average maximum and minimum temperatures by month over thirty years (1958 –88) for the Sunnyside area. Table 7-1A also includes average annual precipitation by month and annually (13.69 inches annually) and average snowfall by month and annually (36.5 inches annually).

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. A rain gauge will be installed at the site to comply with the Air Quality Approval Order (Section 724.411).

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Findings:

The information provided meets the minimum Climatological Resource requirements of the Regulations.

SOILS RESOURCE INFORMATION

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

Analysis:

Elevation of the proposed mine facility is from 5,800 to 6,500 feet. The Soil Survey (Section 3.2 of Appendix 2-3) indicates an average annual precipitation of 8-14 inches with the majority of the precipitation coming in Fall, Winter and early Spring. The soil resources within the Lila Canyon Extension are discussed in Chapter 2, Sections 210 through 224 of the PAP.

Mr. Daniel Larsen, Professional Soil Scientist with Environmental Industrial Services conducted an Order I soil survey of the disturbed area in August of 1998. His report is located in Appendix 2-3. (An addendum attached to Appendix 2-3 is for the proposed fan portal site soils.) 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. All mapping and soil survey work were performed according to the standards of the NRCS's National Cooperative Soil Survey.

Soil Identification and Description and Productivity

The predominant soil classification was Strych fine sandy loam, loamy-skeletal, mixed mesic Ustic Haplocalcid (formerly classified as Ustollic Calciorthis in the 1988 Carbon County Soil Survey).

Order: Aridisol (formed in desert climate)

Suborder: Calcid (accumulation of calcium carbonate)

Great Group: Haplocalcid (other calcids)

Subgroup: Ustic Haplocalcid

(moisture control section is dry less than $\frac{3}{4}$ of the time when the temperature is above 5 C and aridic soil moisture regime bordering on ustic)

Family: loamy-skeletal, mixed mesic (soil temperature)

Series: Strych fine-sandy loam

Phases: bouldery, very bouldery, extremely bouldery

Also found at the site were two soils with little pedogenesis and little horizonization, classified as

Gerst silt loam, loamy, mixed (calcareous), mesic, shallow Ustic Torriorthents

Order: Entisol (young soil, little pedogenesis)
Suborder: Orthent (lack of clay accumulation)
Great Group: Torriorthent (aridic moisture regime)
Subgroup: Ustic Torriorthent
(moisture control section is dry less than $\frac{3}{4}$ of the time when the temperature is above 5 C and aridic soil moisture regime bordering on ustic)
Family: loamy, mixed (calcareous), mesic
Series: Gerst silt loam
Phase: shallow

and Travessilla fine sandy loam, loamy, mixed (calcareous), mesic Lithic Ustic Torriorthents.

Order: Entisol
Suborder: Orthent
Great Group: Torriorthent
Subgroup: Lithic Ustic Torriorthent (lithic contact within 50 cm)
Family: loamy, mixed (calcareous), mesic
Series: Atchee Series (formerly Travessilla series)
Phase: none given

The soils were mapped using the following designations:

DSH = Strych fine sandy loam variant, 3 to 8% slopes
SBG = Strych bouldery 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 – 45% slopes
RBL = Rubbleland- Strych-Gerst complex, 20 – 70% slopes
RBT = Rock outcrop – Travessilla family complex, Atchee Series

From the soil description sheets in Appendix 2-3 and Plate 2-2 Detailed Soils Map of the Mine Facilities Site, the Division notes that the canyon bench holds deep soils, stabilized from wind erosion by a surface layer of biological soil crusts, dried plant litter, boulders and live plant cover. The A horizon layer varies due to position on the slope from three inches (at sample site LC 1 through 3) to 26 inches deep (at sample site LC 4). The B horizon stretches from 31 – 60 inches in the profile and is the zone of accumulation of carbonates. The deepest soils are pockets of colluvium from the cliffs above. The soils are underlain by sandstone bedrock, except at the location of the fan portal where shale and burned coal cover the sandstone rock layer. Shale was also encountered at LC 3 and LC 5 (see discussion of SAR and EC below).

Soils are subject to extremes of temperature. On August 6, 1998 at 11:30 a.m., the temperature of the bare soil at location LC4 was 130 F. At a depth of 20 inches, the temperature was 65 F. These soils are in a mesic soil temperature regime. That means that the mean annual

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soil temperature at 50 cm is less than 59 F as estimated from the mean annual air temperature of 46 F, reported in Section 220. Mr. Larsen has judged the soil moisture regime to be aridic, bordering on ustic, which is to say that at a depth of 20 inches (50 cm), there is a difference in soil temperature greater than 9 F between summer and winter and the soil moisture control section from 12 – 35 inches deep for sandy soil is dry for 90 or more cumulative days in most years, but it is not dry in all parts for more than half the time that the soil temperature is above 9 F at a depth of 50 cm. (Soil Survey Staff. 1990. Keys to Soil Taxonomy, fourth edition. SMSS technical monograph no.6. Blacksburg, Virginia. pp 33 –35.)

The disturbed area vegetation is primarily pinyon-juniper and grass-shrub communities (see Figure 1, Appendix 3-2). On good years the grass-shrub can be expected to produce 600 – 800 lbs/acre and the pinyon-juniper can be expected to produce 250 - 300 lbs/ac (see Appendix 3-7).

Soil Characterization

Soil pedon descriptions were recorded on standard NRCS forms and are provided in Appendix D within Appendix 2-3. The soil horizons were sampled and analyzed according to DOGM guidelines for topsoil and overburden. (Leatherwood, J. and Dan Duce. 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.) Soil texture, rock fragment content (percent by volume), and Munsell color were determined in the field. Generalized soil properties, including percent surface stones and boulders, are summarized in Table 3.21, Properties of Soil Map Units, on page 9 of Appendix 2-3. Soil sampling locations are shown on Plate 2-2, Detailed Soils Map of the Mine Facilities Site.

Soil samples were sent to InterMountain 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 chemistry and fair rating for soil water holding capacity after correction for coarse fragments (Appendix B of Appendix 2-3), except as noted below:

LC1 was rated poor for water holding capacity below 10 inches (after coarse fragment correction)

LC3 was rated poor at depth of 24 – 48 inches for pH = 8.6

LC3 was rated unacceptable at depth of 48 – 53 inches for Sodium Adsorption Ratio (SAR) = 18 and Exchangeable Sodium Percentage (ESP) = 22%

LC5 was rated poor below three inches for water holding capacity and unacceptable for coarse textured soils at depth 40 – 58 inches for SAR = 15, Electrical Conductivity (EC) = 8.89 mmhos/cm, and pH 8.2.

LC10 was rated fair at 0 – 4 inch depth for an EC = 2.58

LC 11 and LC 12 entire profiles were rated poor for water holding capacity after correction for coarse fragments.

The percent rock content within the proposed facilities area is the main deterrent for soil salvage suitability based on the current Division guidelines (citation previously noted). However, Appendix 2-3 indicates that native soils, with a higher rock content than the current guidelines allow, can and should be salvaged.

Organic matter content is relatively low in these soils. Generally, the surface soils ranged between 1.0 to 1.5% organic matter and the subsoils were about 0.5 percent. Total nitrogen and available phosphorus were not analyzed. A measure of total nitrogen and available phosphorus is required by the Division for baseline information so that fertilization of the reclaimed site can attempt to mimic the natural conditions.

A calcic horizon was verified in soil pedons LC1, LC5 and LC6 with calcium carbonate ranging between 20 to 21%. Pedons LC3 and LC4 have some calcium carbonate accumulation in the subsoil but it is less than the 15% needed to be classified as a calcic horizon. Below the calcic horizon, at depths of 30 inches, the soluble calcium decreases and magnesium increases with depth. Usually, the reverse is the case where calcium exceeds magnesium in the soil solution, because calcium is retained much more readily than magnesium on soil colloid exchange sites. But in this case, calcium is being removed from the soil solution by calcium carbonate precipitation in the calcic layer. As a result, soluble magnesium exceeds soluble calcium in the lower soil horizons.

In accordance with R645-301-232.200, since the A horizon is less than six inches deep, the topsoil recovered will be a mix of both the A and B horizon soils. Depths of salvage range from 6 to 18 inches over the site (see Available Soil Resources table in Section 232.100). Large stones, 36 inches or less, are considered part of the soil layer and are included in the topsoil volume estimates.

The Division evaluated this new permit application for the first time in June 2002 and requested baseline soils analysis of total nitrogen and available phosphorus for the six soil map units. The Permittee maintains that this information should have been requested prior to the initial soil survey in 1998. Although it is unfortunate that the information was not specifically requested by Division staff in 1998, the Division's 1988 guidelines clearly indicate that the analysis of topsoil will include nitrogen and phosphorus to provide baseline information. This nutrient information will be utilized at final reclamation to determine the appropriate fertilization rate for the redistributed topsoil.

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Findings:

The information did not provide baseline soil nitrogen or phosphorus as required by the 1988 Utah Guidelines for topsoil and overburden. Prior to approval and in accordance with:

R645-301-222.400, The Permittee should provide baseline soils analyses of total nitrogen and available phosphorus for the six soil map units.

ALLUVIAL VALLEY FLOORS

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

Analysis:

Alluvial valley floor determination

This section summarizes the land use, soil, plants, geology, surface- and ground-water information reviewed by the Division in making the findings required under R645-302-320.

The Lila Canyon Extension is situated in the western Book Cliffs escarpment. Steeply dipping joints transmit ground water from the surface (6.5.3.5) as illustrated in Figure VI-5. Water inflow associated with fault or fracture systems are possible, but not expected to be significant (Section 6.6.1). The surface expressions of the faulting are grabens and draws. Numerous small seeps and springs exist within and adjacent to the permit area (Section 731.220). Appendix 7-3 Probable Hydrologic Consequences (PHC) of mining concludes that the proposed mine is not expected to cause "contamination, diminution or interruption" of underground or surface sources of water.

The Sunnyside Sandstone contains the two seams of interest: Upper Sunnyside and Lower Sunnyside Seams. "The Sunnyside Sandstone is known to transmit groundwater in the Sunnyside area and that portion of the sandstone which underlies the Lower Sunnyside seam is occasionally considered to be a potential aquifer" (Section 6.4.1). Geneva Mine (now known as the Horse Canyon Mine) records indicate that the mine was dry until the Sunnyside Fault was intercepted. This suggests that as mining progresses down dip, "substantial" water may be encountered, but this water will be isolated from the surface recharge zone (Section 6.6.3.1).

The Mancos Shale forms the slopes below the base of the Book Cliffs, overlain in places by pediment deposits (Section 6.4.1 and Plate 6-1). In the permit area, drainages flow in response to snow melt and precipitation events (Section 731.220 and Plate 7-1). Coleman Wash receives the Lila Canyon drainage. Grassy Wash and Marsh Flat Wash collect the flow from the Mancos slopes further south. Little Park Wash channels the flow on the plateau above. There is no valley holding a perennial stream in the permit area (Section 724.700).

Order III soil survey (Plate 2-1) of the mine permit area soils indicates that the soils on the plateau in Little Park Wash are Neto Fine Sandy Loam (Section 220.200). No further information on this soil is available in the PAP. This soil is comparable to the Glenberg soil described in the published Carbon County Soil Survey, according to Mr. Leland Sasser (telephone conversation between Priscilla Burton of DOGM and Mr. Leland Sasser, Soil Scientist and Survey Project Leader with the NRCS, Price Field Office, Utah on 06/05/01).

Plate 3-2, Vegetation indicates that the dominant species growing on the plateau in the vicinity of Little Park Wash are Atriplex, Artemesia and Elymus, none of which are wetland species, according to Cooper. (Cooper, David J. 1989. A Handbook of Wetland Plants of the Rocky Mountain Region. EPA Region VIII.) Little Park Wash falls within the Little Park grazing allotment (Plate 4-2). The land use is unimproved rangeland and wildlife habitat.

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. Based on the information provided in the plan, in accordance with R645-302-321.100, the Division determines that there is no probable existence of an alluvial valley floor. A final determination will be made after all requested resource information has been received.

Findings:

A final determination regarding the existence of an alluvial valley floor will be made after all requested resource information has been received.

PRIME FARMLAND

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

Analysis:

The Natural Resources Conservation Service (NRCS) determined in 1998 that there are no Prime Farmlands at the site (see Appendix 2-1).

Findings:

The Division concurs with the NRCS determination made in 1998 that there are no Prime Farmlands at the site.

OPERATION PLAN

MINING OPERATIONS AND FACILITIES

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

Analysis:

General

The Permittee proposes to develop surface facilities and mine portals near Lila Canyon. The Lila Canyon surface facilities will be used to access coal reserves in the southern area of the permit. The surface facilities are located in the S1/2 of Section 15, T. 16 S., R.14 E. See Plate 5-5 for the Lila Canyon Extension workings.

The average gradient of the Lila Canyon Extension site is 10%. Access to the lower Sunnyside seam at this location requires tunneling from the base of the cliffs upwards at a 12% slope through a sandstone rock slope for a distance of approximately 1,200 feet. The rock material from two of these tunnels and the portal face-ups will be utilized to create a pad for surface facilities. Other cut/fill pads will be constructed from subsoils.

The ventilation portal will be driven from underground workings to the surface. See Plate 5-2 for the locations. Initial mining will be conducted by room-and-pillar methods in the Lower Sunnyside Coal Seam. Production in the first year is estimated to be 200,000 tons, the second to fifth year 1,000,000 to 1,500,000 tons per year. If demand increases, the Permittee will install longwall equipment and production could peak at 4,500,000 tons per year.

The PAP proposes mine portal access, ventilation portal, elevated conveyor, coal storage pile and reclaim system, crusher, truck loop and truck loadout, warehouse and storage yard, office, parking and bathhouse facilities, substation, water storage and water treatment facilities (leach field), topsoil storage pile and sediment pond to be developed (Section 520 and Plate 5-2).

SUWA raised the question of why new portals are needed for access to the new leases. Section 520 indicates that use of the old mine passageways for access to the new lease is not possible due to ventilation, flooding, and caving as well as distance to the Part B federal leases. Developing new portals is economical in terms of dollars and time.

The Horse Canyon mine site was partially reclaimed and received Phase II bond release (Section 528.110). Division records indicate that the reclamation was done in 1990 and 1991, with Phase I bond release granted on February 5, 1997. A Decision Document for Phase II bond release of 51.56 acres was sent to the Office of Surface Mining for their concurrence on October 19, 1999. The area left to be reclaimed is 22.7 acres for a total of 74.26 acres within the permit

area. Conditional approval of Phase II bond release was dated November 10, 1999, contingent upon removal of a sediment pond and culvert. Final approval of the Phase II bond release was dated September 6, 2002. Within the 22.7 acres, several buildings at the site remain standing and negotiations are underway for post-mining use of the buildings by a second party.

To support the new center of activity at Lila Canyon, Emery County will upgrade the existing County Road #126 from State Highway 6 to a corral and from this point will upgrade unimproved roadway RS 2477 from the corral to the Lila Canyon Extension surface facilities (Appendix 1-4).

Findings:

The information provided meets the minimum general requirements of Mining Operations and Facilities.

RELOCATION OR USE OF PUBLIC ROADS

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

Analysis:

The PAP proposes new portal, loadout and office facilities to be developed near Lila Canyon. Currently the road to the site is unimproved as shown on Plate 1-1. Appendix 5-4 of the PAP provides background and ownership information for the existing roads:

- from Horse Canyon to the mine site,
- County Road #126 from Highway 6 to the mine site, also known as unimproved road RS2477 south of the mine site.

Emery County will upgrade and pave the existing County Road #126 (2.63 miles) and RS2477 roadway from State Highway 6 to the Lila Canyon Extension surface facilities (Appendix 1-4, Agreement between Emery County and UEI dated October 19, 1999).

The permitting status of the road was questioned by the Division when an article entitled "Utah DOGM Office Clears Way to Process Lila Canyon Permit," was published in the Sun Advocate, Thursday February 28, 2002. The press release stated that UEI planned to build a 4.7 mile road from the mine site to a Union Pacific rail line. A public notice placed in both the Sun Advocate and the Emery County Progress in April 2002, subsequently clarified that Emery County will construct and improve the 4.7 mile road from the mine site to U.S. Highway 6.

The PAP states in Section 521.133 that UEI does not propose relocation of the public road. The county road will fall partly within the permit area (Section 521.123 and Plate 5-2), and

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a culvert will be replaced beneath the county road (Section 521.170).

Appendix 1-4 of the application contains a copy of a letter from the Emery County Road Department dated January 10, 2001. The letter consents to mining within 100 feet of the public road and requires a fence adjacent to the road right of way for public safety. Plate 5-2 shows that the chain link fence will border the road.

Findings:

The information provided in the PAP meets the requirements of the Regulations for relocating public roads.

AIR POLLUTION CONTROL PLAN

Regulatory Reference: 30 CFR 784.26, 817.95; R645-301-420.

Analysis:

First year production from the mine is estimated to be 200,000 tons, increasing in the second through fifth year to between 1,000,000 and 1,500,000 tons. Long wall mining could be utilized to generate as much as 4,500,000 tons a year (Section 523).

Appendix 4-3 contains correspondence between UEI and the Department of Environmental Quality, Division of Air Quality (DAQ). In the cover letter for the Notice of Intent dated December 22, 1998, UEI requested approval for a Minor Source of up to 2,000,000 tons/year. An Approval Order (DAQE-702-99) was issued August 27, 1999.

The Approval Order (AO) indicates public comments were considered in developing the requirements of the AO for this new source. The DAQ received five public comments on degradation of the environment in general and one comment referring to air quality degradation in particular.

The AO is predicated on UEI operating according to the Notice of Intent submitted to the DAQ on December 24, 1998, and additional information submitted to the DAQ on February 19, 1999 and May 11, 1999.

The following equipment was approved with the AO:

- One enclosed crusher rated at 500 tons/hr equipped with dust suppression spray at its exhaust.
- One truck loading facility with enclosed 450 tons surge bin and sprays as needed
- One stacking tube with associated coal stockpile

- One reclaim system conveyor
- Associated conveyors equipped with dust suppression sprays at all transfer points.
- Mobile diesel equipment.
- 0.68 miles of paved road, posted speed limit 25 mph.

The requirements of the AO include:

- annual training of employees;
- control of disturbed or stripped areas through treatment;
- maintenance of 4.0% moisture content of fines;
- watering storage piles;
- limitations on the silt-size coal fines in stored coal and haul roads;
- visible emissions limits;
- maintaining the surface material in a damp/moist condition;
- a production **limit of 1,500,000 tons of coal** per rolling 12 month period;
- **a consumption limit of 63,000 gallons of diesel fuel** per rolling 12 month period;
- use of #2 fuel oil only; and
- sulfur content of fuel oil or diesel is not to exceed 0.5% by weight

The AO from the DAQ ensures that particulates and pollutants will be controlled through very specific dust suppression requirements, pollution control equipment, limited fuel consumption and proper equipment maintenance, limited production, employee training and record keeping. The Division finds that the Permittee has obtained the required DAQ permit and is in compliance with that permit.

Findings:

The information provided meets the minimum regulatory requirements of the Air Pollution Control Plan section of the Rules.

COAL RECOVERY

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

Analysis:

As part of the federal mine plan approval and to meet the requirements of the federal leases, the Permittee is required to submit a resource recovery and protection plan (R2P2) to the BLM. The BLM staff analyzed the R2P2 for maximum economic recovery and found that the

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Permittee met that requirement.

The Division staff reviewed the mine plan and found no significant coal reserves within the permit area that were not being recovered. The Division bases their findings on several factors including technical analysis from other agencies, such as the BLM, for maximum coal recovery.

Coal will be recovered using a continuous miner. Section 522 discusses the use of barrier pillars to isolate the Horse Canyon Mine from the new Lila Canyon Extension, to ventilate, to provide independent escape routes, to protect escarpments, and to possibly retain large quantities of mine water.

The first year production is estimated to be 200,000 tons, increasing in the second through fifth year to between 1,000,000 and 1,500,000 tons. Plans project the utilization of longwall mining to generate as much as 4,500,000 tons a year (Section 523). An increase of this size would require modification of the MRP.

Federal leases cover 5,544 acres of coal reserves (Table 1.1, page 11, Chapter 1), but Horse Canyon Parts A and B will mine through 5,163 Federal lease acres according to Table 4.2A, Chapter 4.

Findings:

The information provided is adequate to describe the complete recovery of coal.

TOPSOIL AND SUBSOIL

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

Analysis:

Removal and Storage

The Permittee has outlined a disturbed area boundary on Plate 5-2 and has shaded undisturbed areas within those areas on Plate 5-2. The PAP indicates in Section 232.100 that “surface disturbance may not be required on all of the acreage identified as the disturbed area.” The difference between the acreage falling within the disturbed area boundary (48 acres) and that to be disturbed (25 acres) is shown in the Available Soil Resources Table in Section 232.100. Since Regulation 645-301-232.100 requires topsoil removal from all disturbed areas, further explanation of the need to include 23 acres of undisturbed land within the disturbed area

boundary has been requested.

For the purposes of removal, the PAP defines topsoil as all soil from the surface down to eighteen inches (Section 231.100). Plate 2-3 Soil Salvage and Replacement provides guidance for the topsoil removal. Plate 2-3 shows removal of eighteen inches of topsoil from the central and northwest portion of the disturbed area with twelve to eight inches being removed from the roadway and twelve to eighteen inches removed from the sediment pond location and eight to eighteen inches removed from beneath the coal stockpile and coal storage bin. A soil scientist will be on-site during topsoil removal (Section 231.100).

The PAP describes topsoil removal in several sections in the plan as follows:

- The depth of “topsoil” removal will be eighteen inches “from those areas of the mine yard where material will be excavated in order to achieve final yard configuration,” (Section 232.100).
- “The actual topsoil salvage will consist of removing a surface layer up to 18 inches thick over the disturbed area.” (Section 232.200)
- “Available underlying soils will be salvaged from stony disturbed areas” (Section 232.710).
- “If shale is encountered within 18 inches only the soil above the shale will be salvaged. (Plate 2-3).” (Section 232.100).

Soils will be removed from all disturbed areas to a depth of eighteen inches or to shale (Section 232.300) with the following exceptions:

- The steep rocky slopes within the disturbed area below and between the conveyor and coal storage pile (Section 232.710).
- The two bents to be constructed for the conveyor.
- The area of topsoil storage, except that topsoil will be removed from the access road to and around the topsoil pile, but not from beneath the topsoil pile (Section 232.100).
- From undisturbed islands within the disturbed area (Section 234.220).

The Permittee will install an enclosed conveyor (Section 232.710) in an attempt to keep the native soils (beneath the conveyor and in undisturbed islands) free of coal accumulations. Installation of jersey barriers will protect the slope from encroachment by the coal stockpile. A commitment to vacuum on either side of the conveyor a distance of twenty feet has been included in the event that coal fines are blown from the stockpile (Section 232.710).

Soils available for salvage are indicated in a table of Available Soil Resources in Section 232.100. The table indicates that 61,512 loose cubic yards of soil may be available for storage in the topsoil pile. The table divides salvageable soil by map unit type. Soils will be removed from the 25 acres to be disturbed with a crawler-tractor, grader, front-end loader, and/or trackhoe.

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To protect the soil resource, the Permittee has committed to handling the soils at an optimum moisture content, when the soils are loose and friable (Section 231.200), adding moisture or allowing the soils to dry as needed.

The Permittee commits in Section 232.500 to maintaining records of materials removed and placement of materials either in the topsoil storage pile or in the fill. The Permittee also commits to having a certified soil scientist on site during construction and reclamation phases (Section 232.100). The soil scientist would log pedestal heights to verify soil removal depths (Section 232.500). Further the PAP provides a commitment to develop As-Built maps showing where subsoil materials have been used as fill material (Section 232.500).

SUWA commented on the need for soil-borrow areas. Topsoil will be recovered from all disturbed areas (from a minimum depth of 6 inches from RBT soil up to 18 inches from VBJ, SBG and DSH soils). The total recovery of topsoil is estimated at 52,000 bank cubic yards. On the average, this represents a salvage depth of 15 inches over the 25 proposed disturbed acres. Furthermore, the Permittee indicates in the PAP (Section 233) that no substitute topsoil will be necessary based upon the Order 1 Soil Survey that indicates subsoils are also suitable for plant growth down to a depth of 48 inches. There is no need to develop a soil borrow area.

Storage of the approximately 60,000 loose cubic yards of topsoil will be in a stockpile with the approximate dimensions shown on Figure 1 of Chapter 2: 26 feet height, 246 feet length, 146 feet width (see also Section 232.100). Plate 5-7A-2 shows cross-sections of the proposed stockpile. At cross-section locations, the pile height is between six and twelve feet. **Plate 5-7A-2 refers to Plate 2-4 which does not exist.**

The topsoil stockpile is located on Plate 5-2 and Plate 5-7. Topsoil stockpile will be protected from upstream flow by drainage ditches. The surface of the stockpile will be pitted to retain moisture and reduce erosion (Section 231.100 and 231.400). The Division notes that this practice is described in the Practical Guide to Reclamation (DOGM, 2000), available at <http://dogm.nr.state.ut.us>. The topsoil will be retained in place with the use of berm/ditches or silt fences surrounding the pile. The stockpile will be mulched and seeded using the mix in Table 3-4, after September 15 (231.400).

Table 3-4 Interim and Final Reclamation Seed Mix includes Yellow Sweet Clover, Alfalfa and Forage Kochia at the request of the BLM, "based on their proven benefits to wildlife and domestic stock as well as their ability to provide erosion control and their widespread distribution as a result of previous seeding public lands." The Division has requested modification of the species mix in Table 3-4 under Operation Plan Vegetation (See deficiency written under R645-301-331). Species in the mix should be chosen to control erosion yet maintain the natural beauty of the landscape.

The Permittee has committed to gathering the surface four inches of soil and vegetation separately from the remainder of the topsoil salvage (Section 231.400). The surface soils will be

applied to the surface of the topsoil pile after gouging. The surface layer of soil is valuable, for it contains seeds, cryptogam filaments, other microorganisms, organic matter, elevated levels of nitrogen and phosphorus. The biologic soil crusts established on the topsoil pile could be later harvested for inoculation of the reclaimed site.

The Division previously recommended that the topsoil pile receive an initial irrigation after the 2 – 4 inch surface layer is applied, to ensure good contact, based upon the paper: Jayne Belnap, "Cryptobiotic Soil Crusts: Basis for Arid Land Restoration (Utah)," Restoration and Management Notes 12:1 Summer 1994. The Permittee has declined to irrigate. Since the research on this issue is limited, the Division will not press the issue, unless and until further evidence of the benefits of irrigation in establishing transplanted cryptogam filaments is published. The procedure that the Permittee has outlined for distribution of cryptogam filaments during final reclamation might be the best way of establishing the cryptogams on the topsoil pile as well. i.e. crushing and sieving the soil and cryptogam colonies and adding them to the hydrospray of mulch.

Storage of topsoil from the topsoil access road will be in berms around the topsoil stockpile (Section 232.100). Storage of topsoil from the fan portal will be in a berm around the fan disturbance (Section 234.100). Plate 5-2 shows the location of the topsoil berm at the fan site. To avoid contamination with rock dust, the berm will not extend in front of the fan. The bermed fan portal soil will be protected with a silt fence and vegetated (Section 234.100).

Subsoils

In Section 232.500, the PAP refers to a Salvageable Soils Map in Appendix A-2 that is incorporated into the PAP. Although not stated in the PAP, the Division understands that the referenced Map is part of the Order 1 Soil Survey and that it is located in Appendix A-2 of Appendix 2-3. The Permittee should make this correction page 13 of Chapter 2. This map recommends salvage of between six and 48 inches of topsoil and subsoil from the disturbed area.

The PAP states that subsoil from 12 – 30 inches from cut areas will be used as fill material during operations (Section 232.500). Subsoil will also be used as cover over the waste rock disposed of in the refuse area (pages 2-3, Appendix 5-7). Section 232.700 specifies the subsoil recovery for soil types SBG, DSH, and VBJ, based upon recommendations found in Part 3.4 of Appendix 2-3 Soil Inventory. The Division understands that the recovery depth in inches is the depth of salvageable subsoil remaining after topsoil removal. Thus, for SBG soil the 30 inch removal thickness would come from from between 18 inches and 48 inches in the profile.

SUWA commented that a subsoil stockpile should be required. Adequate topsoil will be salvaged from the proposed disturbed area, but the location of subsoil used as fill material will be mapped for use during reclamation to extend rooting depth of the reclaimed site (Section 232.500 and Section 241). The subsoil from the cut areas will be replaced in its approximate original location. These subsoils will be used as fill underneath parking areas, roads, buildings,

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and storage sites. These subsoils will be protected during operations by asphalt, concrete, or gravel over an impervious membrane (Section 232.500). Contaminated subsoils will be hauled to a landfill site. (It is not clear to in the PAP what contaminants will be monitored and what monitoring will occur.)

Findings:

The Division will coordinate review of the species found in Table 3-4 with the BLM to obtain a species mix that can control erosion yet maintain the natural beauty of the landscape, an issue raised six times through public comment. Several areas of deficiency have been identified with the topsoil salvage and storage plans. Prior to approval and in accordance with:

R645-301-121-200, 1. Plate 5-7A-2 refers to Plate 2-4 which does not exist.
2. Section 232.500, page 13 of Chapter 2, the Salvageable Soils Map in Appendix A-2 is more easily found if cited as Appendix A-2 of Appendix 2-3.

R645-301-553.252, The Permittee must explain what contaminants will be monitored in the stored subsoil and how the monitoring will take place.

R645-301-234.230, Application of cryptogams to the surface of the topsoil pile should include a test of the proposed method of application of cryptogams to the final reclamation surface. i.e. crushing and sieving the soil and cryptogam colonies and adding them to the hydrospray of mulch..

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 PAP indicates in Section 542.640 that a minimum of two feet of cover will be placed over sand and gravel road surfacing materials and asphalt will be disposed off-site. Concrete will be buried by four feet of cover (Section 542.741).

Coal mine waste

Appendix 5.7 describes 25,000 loose cubic yards of underground development waste generated from portal development. Additional refuse will come from the operation of the screening plant and the mine itself. Appendix 5.7 indicates that there is room at the refuse

disposal facility for storage of an additional 19,500 cu yards of mine waste.

Burning and burned waste utilization

Appendix 5-3 Coal Mine Waste Fire Extinguishing Plan calls for smothering potential fires with borrowed soil material. The source of the borrowed soil is not determined, but implies an off-site source. On-site subsoils are already committed for use as final reclamation cover over the mine waste. On-site subsoil cover may not be used for fire suppression.

Findings:

The information provided meets the minimum requirements of the Regulations.

RECLAMATION PLAN

GENERAL REQUIREMENTS

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

Analysis:

Section 241, 242, and 243 discuss topsoil and subsoil redistribution. Appendix 5.7 describes reclamation of the refuse pile. Appendix 5.8 describes the reclamation of the remaining area and divides the 48.23acre site into two reclamation units based upon slope. The upper unit is a water treatment area and portal pad, approximately 3.4 acres. The lower unit is 37.37 acres.

Findings:

The information provided is adequate to generally describe the reclamation plans as required by the Regulations.

TOPSOIL AND SUBSOIL

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

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Analysis:

Redistribution

The PAP describes in Section 241 grading the surface to AOC, replacement of subsoils in the root zone, ripping, replacement of topsoil, replacement of boulders and gouging and treatment of the surface with an inoculum.

The grading sequence is itemized and begins with:
“a. Grade all areas where no subsoil is being stored.
b. Replace subsoil on areas from which it was removed.”

SUWA commented that the sequence as written was very confusing. The Permittee has provided Plate 2-3 outlining Soil Salvage and Replacement. Crucial to the understanding of steps a and b in the regrading is an As-Built map committed to under Section 232.500 that will locate the subsoils determined to be suitable for placement in the top four feet rooting zone at reclamation, i.e. subsoil from soil map units SBJ, DSH and VBJ identified in the Order 1 Soils Survey. This proposed As-Built map is referred to in the discussion of Section 241 and 242.100.

SUWA commented on the depth of topsoil replacement, believing that the PAP called for eighteen inches of topsoil to be replaced over the entire site. Section 242.100 describes the replacement of topsoil to approximate the variable depth of topsoil encountered at the site during the Order 1 Soil Survey (see Plate 2-3 Topsoil salvage and Replacement). Section 242.100 also outlines the equipment to be used to replace the topsoil.

Inoculum is referred to in Section 241 and soil amendments are referred to in Section 243. The inoculum will stimulate microbial activity in the soil. Re-establishment of biologic soil crusts will be attempted on the surface of the topsoil storage pile (Section 231.400). If successful, this source of biologic soil crusts will be utilized to inoculate the reclaimed site (Section 244.200). At the time of final reclamation, more options for cryptogam re-establishment may be available. For example, the U.S. Army Corps of Engineers is experimenting with cyanobacteria pellets, which may be commercially available in two years (see <http://www.cecer.army.mil/td/tips/product/details.cfm?ID=527>).

Amendments will replace lost soil nutrients based upon testing of the topsoil stockpile prior to redistribution. Grab samples will be collected to a depth of 18 inches from the stockpile and analyzed for Nitrogen, Potassium, and Phosphorus (Section 243) The Division would rather that the bottom and middle portions of the pile are sampled to see what the effects of darkness, compaction, and sterility have been on the fertility of the topsoil stockpile. Appendix 5-8 indicates fertilizer application to the reclaimed surface will be based upon the testing of the topsoil.

In past reclamation, the Division has noted that the application of nitrogen was a detriment to the encouragement of native species.

Findings:

The information provided in the application is adequate for the purposes of the Regulations with the following exception. Prior to approval and in accordance with:

R645-301-243, The PAP should indicate that sampling of the stored topsoil will be from the middle and bottom of the stockpile.

STABILIZATION OF SURFACE AREAS

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

Analysis:

For this site, the Order 1 Soil Survey identifies microbial crusts on the surface of the soil. Microbial crusts stabilize the soil through protection of the soil from water and wind erosion.

The plan recognizes the need to re-introduce microbial life in Section 241, and specifies a method in Section 244.200. Section 244.200 indicates that if soil crusts form on the topsoil pile, they will be added to the wood fiber mulch application in an attempt to reestablish biologic soil crusts on the reclaimed soil surface.

The best technology for re-introducing cryptogams on a large scale is still a subject of research. The internet site www.soilcrust.org provides excellent references. Introduction of biologic soil crusts may be as simple as sprinkling the crushed organisms over the surface and irrigating as described by Jayne Belknap in the publication, "Cryptobiotic Soil Crusts: Basis for Arid Land Restoration (Utah)," Restoration and Management Notes 12:1 Summer 1994. The Permittee's commitment to advancing this research is commendable.

Appendix 5-8 Reclamation and Enhancement Plan describes the means of soil stabilization including: gouging of the site to encourage a roughened appearance as shown in Figure 1; and placement of large rocks and boulders and vegetation; application of 500 lbs/acre wood fiber mulch and 100 lbs/acre of tackifier with seeding and then a second over spray of 1500 – 2000 lbs/acre of wood fiber mulch with 100lb/ac of tackifier and 200 lb/ac of 16-16-8fertilizer. Appendix 5-8 further describes the use of wood fiber mulch over topsoil.

In accordance with R645-301-244.300, rills and gullies that contribute to a violation of water quality or that disrupt the post-mining land use will be filled, regraded or stabilized.

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Findings:

The information in the PAP meets the requirements of the Regulations with regard to stabilization of the soil surface and control of erosion and air pollution attendant to erosion.

RECOMMENDATIONS:

The Permittee should rework the PAP to include the information requested by this technical review to provide a very clear understanding of the operation and reclamation proposed.