

# TECHNICAL MEMORANDUM

## Utah Coal Regulatory Program

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November 17, 2008

TO: Internal File

THRU: Jim Smith, Permit Supervisor *JS 12/10/08*

THRU: Dave W. Darby, Team Lead *[Signature]*

FROM: Priscilla Burton, Environmental Scientist III, Soils. *PWB by SES*

SUBJECT: Lila Canyon Design Changes, UtahAmerican Energy Inc., Horse Canyon Mine, C/007/0013, Task #3017

### SUMMARY:

On July 22, 2008, the Permittee provided an amendment to change the designs for the Lila Canyon surface facilities. Pending litigation over construction at this site (Memorandum of Decision and Order, Case 2:07CV678 DAK, United States District Court for the District of Utah, Central Division, dated November 13, 2008) and several emergency amendments that arrived at the Division subsequent to this application (i.e. Skyline Task 3047; Dugout Task 3068; Bear Canyon 3022 and 3070, West Ridge Task 3077) have delayed the review of this design change.

New designs are described in Appendix 5-4 and 5-7 of the amendment and call for increasing disturbed area from 25.3 acres to 34 acres and a 50% reduction in the islands of undisturbed land within the disturbed acres from 17.3 acres down to 8.7. The expansion will accommodate a larger coal stockpile as shown on Plate 5-8. The design changes call for soil salvage from only 2.65 additional acres (Available Soil Resources Table, Chap 2. pg. 9), although the disturbed area will increase by 8.6 acres. The topsoil salvaged will increase to 66,000 loose cubic yards.

During a meeting to discuss this technical analysis on November 24, 2008, the Permittee will be reminded of the commitments in the plan that pertain to site construction: having a qualified soil specialist on site during soil salvage, salvaging soil during optimum moisture content, and keeping records of soil volumes salvaged and locations of subsoil placement. Cryptogam salvaged in December 2007 have been stored in open buckets in a cool, dark location, see inspection report #1516. The condition of the salvaged cryptogams should be evaluated and additional buckets collected prior to soil salvage, if necessary.

TECHNICAL MEMO

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The MRP includes a commitment to have a qualified soils specialist on site during topsoil salvage and redistribution (Section 232.100).

The following deficiencies were identified with this amendment to the MRP:

**R645-301-113.300**, In conjunction with the detailed design change amendment to the MRP (Task 3017), please update Appendix 1-3 to include the violation records for all affiliates during the years 2007 and 2008.

**R645-301-121.200**, Plate 5-2 shows the powder and cap magazine storage site on the topsoil storage pile. Please correct the plate to show the storage location for the explosives magazine adjacent to, but not on the topsoil storage pile. • Section 520 (Refuse Piles) and Appendix 5-7 refer to a Temporary Refuse Pile. Please provide the location of the Temporary Refuse Pile on Plate 5-2.

**R645-301-121.300**, Both in hard copy and electronic versions of all future amendments must be provided as red-line/strike-out versions of the approved MRP, to facilitate Division review.

**R645-301-232.100**, As proposed, undisturbed acres represent approximately 26% of the disturbed area. Since, vegetation and soils of undisturbed lands will likely be subject to impacts from fugitive dust and coal fines blowing from the increased coal stockpile acreage, and since the soil type to be impacted is DSH and XBS, having 18 and 12 inches of salvageable soils, respectively, the Division will require topsoil salvage from all acreage within the disturbed area boundary shown on Plate 1-2, as required by R645-301-232.100, with the exception of soil types which may fall within the exclusion of R645-301-232.700. • The condition of the salvaged cryptogams should be evaluated and additional buckets collected prior to soil salvage, if necessary.

**R645-301-232.710 and R645-301-121.200**, The application must clearly state, in the narrative, the acreage of rocky slopes that are inaccessible to soil salvage. The Available Soil Resources Table in Section 232.100 lists 27.95 acres of topsoil salvage. The difference between the area to be disturbed (33.9 acres) and the area of soil salvage (27.95 acres) is 5.95 acres, which probably represents the acreage of rocky slopes that are inaccessible to soil salvage. If so, the application should clearly present this fact in the narrative.

**R645-301-420, (1)** In accordance with the approved Air Quality Order DAQE-702-99 General Conditions # 5 and 6, UEI must document the current status of communications with the DAQ concerning the increased acreage and tonnage of open coal stockpile and any potential revisions

to DAQE-702-99. Communication with the DAQ should also describe the status of construction at the site.

**R645-301-526.222**, Deposition of coal fines onto undisturbed ground from the ROM storage pile will be visually monitored quarterly (Section 234.220 MRP – Part B). The plan states that if monitoring reveals coal fine deposition, then a vacuum truck will clean up coal dust. This is unacceptable. The operation plan should not allow for deposition to accumulate to the point where a vacuum truck is warranted, rather, the plan should state that at the first sign of deposition on undisturbed ground, water sprays on the open stockpile will be warranted as per General Condition #16 of the August 27, 1999 Approval Order (DAQE-702-99). In addition, if deposition of coal fines is persistent, then additional measures should be considered to prevent further coal fine deposition on undisturbed ground (i.e. wind fence).

**TECHNICAL ANALYSIS:**

## **GENERAL CONTENTS**

### **VIOLATION INFORMATION**

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

**Analysis:**

Appendix 1-3 Part B contains violation information, which was current through the year 2006. In conjunction with the detailed design change amendment to the MRP (Task 3017), the Division has requested that Appendix 1-3 requires be updated for the years 2007 and 2008. The deficiency is repeated below.

**Findings:**

The information provided does not meet the reporting requirements. Prior to approval, the application must include the following in accordance with:

**R645-301-113.300**, In conjunction with the detailed design change amendment to the MRP (Task 3017), please update Appendix 1-3 to include the violation records for all affiliates during the years 2007 and 2008.

### **PERMIT APPLICATION FORMAT AND CONTENTS**

Regulatory Reference: 30 CFR 777.11; R645-301-120.

**TECHNICAL MEMO**

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**Analysis:**

The electronic copy of the amendment scanned into the M: drive was a redline/strikeout version of the MRP. The CD provided to the Price Field Office was not in the same format as that scanned on the M: drive and included many extraneous files.

The hard copy of the amendment was only provided as a clean copy. The Price Field Office had to rely on the hard copy, since the CD was not accurate. The clean copy application was time consuming to review, because Division staff had to determine what changes were being made to each revised page.

**Findings:**

The information provided does not meet the application format requirements. In accordance with:

**R645-301-121.300**, Both in hard copy and electronic versions of all future amendments must be provided as red-line/strike-out versions of the approved MRP, to facilitate Division review.

## **ENVIRONMENTAL RESOURCE INFORMATION**

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

### **PERMIT AREA**

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

**Analysis:**

The 42.6 acre permit area boundary is outlined on Plate 5-2. This entire permit area has been bonded (Section 521.163 and Ex. B Reclamation Agreement), but new designs call for only disturbing 33.9 acres. This amendment increases the disturbed area from 25.3 acres to 33.9 acres and reduces by 50% the acreage of undisturbed land within the permit area from 17.3 acres down to 8.7. This undisturbed land is on the southern boundary of the permit area on the east, south and west of the coal stockpile, which is to be enlarged from 27,000 tons to 200,000 tons of open storage (Chap 5, pg. 13).

These undisturbed acres represent approximately 26% of the disturbed area. Since, vegetation and soils of undisturbed lands will likely be subject to impacts from fugitive dust and coal fines blowing from the increased coal stockpile acreage, and since the soil type to be impacted is DSH and XBS, having 18 and 12 inches of salvageable soils, respectively, the Division will require topsoil salvage from all acreage within the disturbed area boundary shown on Plate 1-2, as required by R645-301-232.100, with the exception of soil types which may fall within the exclusion of R645-301-232.700.

**Findings:**

The information provided does not meet the requirements for permit area. Prior to approval, the Permittee must indicate the following, in accordance with:

**R645-301-232.100**, As proposed, undisturbed acres represent approximately 26% of the disturbed area. Since, vegetation and soils of undisturbed lands will likely be subject to impacts from fugitive dust and coal fines blowing from the increased coal stockpile acreage, and since the soil type to be impacted is DSH and XBS, having 18 and 12 inches of salvageable soils, respectively, the Division will require topsoil salvage from all acreage within the disturbed area boundary shown on Plate 1-2, as required by R645-301-232.100, with the exception of soil types which may fall within the exclusion of R645-301-232.700.

**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:**

The MRP- Part B meets the requirements for soil survey and characterization. UEI discusses soil resources within the Lila Canyon Extension in Chapter 2, Sections 210 through 224 of the MRP- Part B.

Daniel Larsen, a Professional Soil Scientist with Environmental Industrial Services (E.I.S.) conducted an Order I soil survey of the disturbed area in August of 1998. The Soil Survey is found in Section 3.2 of Appendix 2-3. The survey contains soil descriptions, soil pedon descriptions, a soil-salvage suitability analysis, laboratory soil testing data, field soil profile-descriptions, soil and landscape photographs, a soil map, and a salvageable-soils map. Mr. Larsen performed all mapping and soil survey work according to the standards of the NRCS's National Cooperative Soil Survey. There has been no further survey work done accompanying this application for detailed design changes (Task 3017).

TECHNICAL MEMO

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*Soil Identification and Description, and Productivity*

The predominant soil classification is Strych fine sandy loam. 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 colluvial soils, stabilized from wind erosion by a surface layer of biological soil crusts, dried plant litter, boulders and live plant cover. The topsoil (A-horizon layer) varies from three to 26 inches deep due to position on the slope. The B-horizon stretches from 31 – 60 inches in the profile and is a zone of carbonate accumulation. Sandstone bedrock underlies the soils, except at the location of the fan portal where shale and burned coal cover the sandstone rock layer. Surface soils are subject to extremes of temperature (Sec 3.2, Appendix 2-3).

The disturbed area vegetation is primarily pinyon-juniper and grass-shrub communities (Plate 3-2). Productivity estimations made in 2003 placed the disturbed area productivity at 350 lbs/acre and the grass/shrub reference area at 450 lbs/ac, low values due to drought (see Appendix 3-2 letter dated 2003).

*Soil Characterization*

Soil pedon descriptions on standard NRCS forms are provided in Appendix D within Appendix 2-3. Soil horizons were sampled and analyzed according to Division guidelines for topsoil and overburden. Table 3.21 in Appendix 2-3 provides generalized soil properties, including percent surface stones and boulders. Soil sampling locations are shown on Plate 2-2, Detailed Soils Map of the Mine Facilities Site. Intermountain Laboratories, Inc analyzed the soil samples. Laboratory data sheets are found in Appendix C of Appendix 2-3.

Appendix 2-3 contains soil macronutrient status information analyzed by BYU Soil and Plant Analysis Laboratory May 1, 2003, providing a reference for comparison with the nutrient content of the redistributed topsoil at final reclamation.

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, in accordance with R645-301-232.200. Depths of salvage range from 6 to 18 inches over the site (see Available Soil Resources table in Section 232.100). A calcic horizon was verified in soil pedons LC1, LC5 and LC6 which will provide a marker for soil salvage depth. The percent rock content within the proposed facilities area is high according to the 1988 Division guidelines, however it is not a deterrent to soil salvage. Large stones, 36 inches or less, are considered part of the soil layer and are included in the topsoil volume estimates.

**Findings:**

The information provided meets the environmental soils resource information requirements of the R645- Coal Rules.

**ALLUVIAL VALLEY FLOORS**

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

**Analysis:**

**Alluvial Valley Floor Determination**

The information provided in the plan was adequate for the Division to determine that there is no probable existence of an alluvial valley floor. There has been no change to the information provided with the detailed design changes reviewed under Task 3017.

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 in the western Book Cliffs escarpment. Numerous small seeps and springs exist within and adjacent to the permit area (Section 731.220). Steeply dipping joints transmit ground water from the surface (Section 6.5.3.5) as illustrated in Figure VI-5. The surface expressions of the faulting are grabens and draws. The general strike of the beds in the permit area "B" is N22°W dipping at 11% to greater than 16% towards the East (Figure VI-3 and Plate 7-1-B and Section 6.4.2, Section 6.5.3.3).

Water inflow from the Geneva Tunnels is anticipated (Section 6.6.1). Water inflow associated with fault or fracture systems are possible, but not expected to be significant. The Sunnyside sandstone member of the Blackhawk formation contains the two coal seams of interest: Upper Sunnyside and Lower Sunnyside Seams. The sandstone beneath the Lower Sunnyside coal seam is considered to be a zone of groundwater accumulation (Section 6.4.1). Historical records for the Geneva Mine (now known as the Horse Canyon Mine) 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) and indications are that the Sunnyside Fault will not be encountered within the Lila Canyon Extension (Section 6.5.3.3).

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

**TECHNICAL MEMO**

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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) indicates that the soils on the plateau in Little Park Wash are Neto Fine Sandy Loam (Section 220.200). This soil is comparable to the Glenberg soil described in the published Carbon County Soil Survey, according to Leland Sasser, Soil Scientist and Survey Project Leader with the NRCS, Price Field Office, Utah (consultation June 5, 2001). 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.

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.

**Findings:**

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.

**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 proposed disturbed site (see Appendix 2-1). There has been no change to this information with the design change amendment Task 3017.

**Findings:**

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

## OPERATION PLAN

### AIR POLLUTION CONTROL PLAN

Regulatory Reference: 30 CFR 784.26, 817.95; R645-301-244, -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), dated 1999. An Approval Order (DAQE-702-99) was issued August 27, 1999.

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. In particular, Item 5 of the AO states that "Any future changes or modifications to the equipment and processes approved by the AO that could affect the emissions covered by the AO must be approved in accordance with R307-401-1, UAC."

UEI must include in this application the current status of communications with the DAQ concerning the increased acreage and tonnage of open coal stockpile and any potential revisions to DAQE-702-99.

In addition, Item 6 of the AO requires that the AO may revoke the AO if construction is not completed within 18 months of the date of issuance. UEI informed the DAQ of delayed construction in a letter dated June 10, 2000, as required by AO DAQE-702-99 General Condition #6 (E-mail communication between Maung Maung and Priscilla Burton on June 3, 2004). Communication concerning the enlarged coal stockpile should also describe the continued delay of construction.

#### Findings:

The operations plan must include the following information to be in compliance with the AO DAQE-702-99:

**R645-301-420, (1)** In accordance with the approved Air Quality Order DAQE-702-99 General Conditions # 5 and 6, UEI must document the current status of

TECHNICAL MEMO

communications with the DAQ concerning the increased acreage and tonnage of open coal stockpile and any potential revisions to DAQE-702-99. Communication with the DAQ should also describe the status of construction at the site.

## TOPSOIL AND SUBSOIL

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

### Analysis:

According to statements made in Section 232.100, Section 411.110, Section 542.200, Appendix 5-8, the disturbed area boundary will encompass 42.6 acres. [NOTE: The Available Soil Resources Table (Section 232.100) indicates that there are potentially 48.23 acres of surface disturbance. This table was taken from the soil survey and does not accurately reflect UEI's intention to include 42.6 acres of disturbance within the permit area boundary.]

The 42.6 acre permit area is outlined on Plate 5-2. This entire permit area has been bonded (Section 521.163). However, only 33.9 acres will be disturbed, leaving 8.7 acres of undisturbed islands within the disturbed area boundary.

However, the Available Soil Resources Table in Section 232.100 lists 27.95 acres of topsoil salvage. The difference between the area disturbed (33.9 acres) and the area of soil salvage (27.95 acres) is 5.95 acres, which probably represents the acreage of rocky slopes that are inaccessible to soil salvage. If so, the application should clearly present this fact in the narrative.

The Division requests that with the exception of the steep rocky slope beneath the conveyor (east of the coal stockpile), all topsoil be removed within the disturbed area boundary shown on Plate 1-2 (see discussion in the Permit Area section of this TA, above).

Islands will be marked with signs (Section 231.100) and protected by a 20 ft buffer zone (Section 234.220). The undisturbed islands will be protected with rock barriers and incidental rock distribution (Plate 5-2). This will not eliminate the need for the Divisions recommendations to protect the slopes beneath the conveyor from incidental coal fine deposition (see the Surface Facilities section of this TA).

For the purposes of removal, Section 231.100 of the MRP- PART B defines topsoil as all soil from the surface down to eighteen inches. Plate 2-3 Soil Salvage and Replacement provides guidance for the topsoil removal, illustrating removal of eighteen inches of topsoil from the central and northwest portion of the disturbed area; twelve to eight inches being removed from

the roadway; 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.

Soils will be removed from all disturbed areas including stony areas to a depth of eighteen inches or to shale (Sections 232.100 and 232.300) with the following exceptions (Section 232.700):

- The RBL and RBT soils on steep rocky slopes within the disturbed area below and between the conveyor and coal storage pile (approximate acreage requested).
- The two bents to be constructed for the conveyor.
- The area of topsoil storage (topsoil will be removed from the access road to and around the topsoil pile, but not from beneath the topsoil pile (Section 232.100)).

Undisturbed islands of soil will be marked with signs (Section 231.100) and protected by a 20 ft buffer zone (Section 234.220). The undisturbed islands will be protected with rock barriers and incidental rock distribution (Plate 5-2).

UEI will install an enclosed conveyor (Section 232.710) in an attempt to keep the native soils (beneath the conveyor) free of coal accumulations. Installation of jersey barriers will protect the slope from encroachment by the coal stockpile. UEI will monitor the undisturbed soils quarterly for coal fine deposition (Section 234.220 MRP – Part B, see also discussion under Support Facilities in this TA).

Soils to be salvaged are estimated to be 56,000 bank CY (Table of Available Soil Resources in Section 232.100). The table divides salvageable soil by map unit type. Soils will be removed from the 27.95 acres to be disturbed with a crawler-tractor, grader, front-end loader, and/or trackhoe.

To protect the soil resource, UEI has committed to handling the soils at an optimum moisture content, when the soils are loose and friable (Section 231.100), adding moisture or allowing the soils to dry as needed.

There will be a qualified soil scientist to oversee the soil salvage, construction of subsoil storage site, and reclamation of the site (Sections 231.100 and 232.100). UEI further commits in Section 232.500 to maintain records of materials removed and placement of materials either in the topsoil storage pile or in the fill. Soil pedestals will be left to verify soil removal depths (Section 232.500). Further, the MRP-Part B provides a commitment to develop As-Built maps showing where subsoil materials have been used as fill material (Section 232.500), including thickness of topsoil, subsoil, and substrata.

The Division received comments 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

TECHNICAL MEMO

inches from VBJ, SBG and DSH soils). The total recovery of topsoil is estimated at 56,000 bank cubic yards. On the average, this represents a replacement depth of 15 inches over the proposed 25 disturbed acres. Furthermore, the Order 1 Soil Survey that suggests subsoils are also suitable for plant growth down to a depth of 48 inches (Appendix 2-3). These subsoils will be placed where they can be recovered and utilized to increase the rooting depth at reclamation. There is no need to develop a soil borrow area.

Storage of the approximately 66,000 loose cubic yards of topsoil (loose cubic yards is equal to 56,000 bank cubic yards multiplied by the swell factor of 1.18) will be in a stockpile (Section 232.100 Available Soil Resources Table) with the approximate dimensions 31 ft high X 350 ft long X 250 ft wide (Section 232.100), with 2h:1v side slopes. Figure 1 and Plate 5-2 provide information on proposed construction of the topsoil stockpile.

Topsoil stockpile will be an Alternate Sediment Control Area (ASCA) protected from upstream flow by drainage ditches (design shown in Appendix 7-4). The stockpile will be loosely piled with a rough, irregular, pitted surface retain moisture and reduce erosion (Sections 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 in the fall (after September 15) using the mix in Table 3-4 (Section 231.400). Table 3-4 is a mix of native grasses, forbs and shrubs. Species in the mix should control erosion yet maintain the natural beauty of the landscape. Section 231.100 and Section 231.400 indicate that if seeding does not immediately follow topsoil pile construction, the pile will be roughened again immediately prior to seeding.

The surface layer of soil is valuable, for it contains seeds, cryptogam filaments, other microorganisms, organic matter, elevated levels of nitrogen and phosphorus. UEI has committed to gathering eight, five gallon buckets of cryptogamic soil separately from the remainder of the topsoil salvage (Section 232.100). UEI proposes to try to establish cryptogams on the topsoil stockpile by using the cryptogamic soil as an additive to each load of wood fiber mulch hydrosprayed on the surface of the gouged topsoil pile. The cryptogamic soil will be mixed with wood fiber mulch at a rate of 1% by volume (Section 234.230). [Note: The percentage of cryptogamic soil to be added to the hydromulch should probably be on the order of 1% by volume. The area of the proposed topsoil stockpile is 246 ft X 146 ft with 2:1 side slopes or about one acre. Approximately 4,000 gallons of hydromulch spray are required for one acre, therefore eight, 5 gallon buckets of screened cryptogamic soil (through a ¼ inch sieve) will be added to the tank to create a 1% concentration (conversation between Priscilla Burton and Bill Lee, Skyline Reclamation, on May 27, 2004).] The biologic soil crusts established on the topsoil pile will be later harvested for inoculation of the reclaimed site.

The Division previously recommended that the topsoil pile receive an initial irrigation after the cryptogam/mulch is sprayed onto the topsoil surface, to ensure good contact and growth of the cryptogams. This recommendation was based upon Jayne Belnap's work, "Cryptobiotic Soil Crusts: Basis for Arid Land Restoration (Utah)," Restoration and Management Notes 12:1 Summer 1994. UEI has declined to irrigate. Since the research on this issue is limited, the Division will not press the issue, unless further evidence of the benefits of irrigation in establishing transplanted cryptogam filaments becomes known.

Storage of topsoil from the topsoil storage area 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*

The recommendation for soil salvage of between six and 48 inches of topsoil and subsoil from the disturbed area is based upon the Order 1 Soil Survey (Appendix 2-3 and Section 232.500).

Section 232.500 of the MRP- PART B states that subsoil from 12 – 30 inches from cut areas will be used as fill material during operations. 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 between 18 inches and 48 inches in the profile.

The Division received comments that a subsoil stockpile should be required. An average recovery depth of 15 inches from the site will provide an adequate supply of topsoil for final reclamation. In addition the location of subsoil with suitable reclamation characteristics will be mapped for ease of recovery and replacement during reclamation (Section 232.500, Section 241, Section 242.100). These subsoils will be used as fill underneath parking areas, roads, buildings, and storage sites. These subsoils will be protected during operations by asphalt, concrete, or gravel over an impervious membrane (Section 232.500). Section 232.500 further B indicates that upon reclamation, subsoils found to be contaminated with oil, grease, or salts through visual evaluation will be hauled to a landfill site.

### **Findings:**

The Permittee will be reminded of the commitments in the plan that pertain to site construction: having a qualified soil specialist on site during soil salvage, salvaging soil during

TECHNICAL MEMO

optimum moisture content, and keeping records of soil volumes salvaged and locations of subsoil placement. Cryptogam salvaged in December 2007 have been stored in open buckets in a cool, dark location, see inspection report #1516. The condition of the salvaged cryptogams should be evaluated and additional buckets collected prior to soil salvage, if necessary.

The proposal does not meet the requirements of the R645 Rules. UEI must provide the following, prior to approval and in accordance with:

**R645-301-232.100**, The condition of the salvaged cryptogams should be evaluated and additional buckets collected prior to soil salvage, if necessary. • ***The following deficiency restated from Permit Area Section above:*** As proposed, undisturbed acres represent approximately 26% of the disturbed area. Since, vegetation and soils of undisturbed lands will likely be subject to impacts from fugitive dust and coal fines blowing from the increased coal stockpile acreage, and since the major soil types to be impacted are DSH and XBS, having 18 and 12 inches of salvageable soils, respectively, the Division will require topsoil salvage from all acreage within the disturbed area boundary shown on Plate 1-2, as required by R645-301-232.100, with the exception of soil types which may fall within the exclusion of R645-301-232.700.

**R645-301-232.710 and R645-301-121.100**, The application must clearly state, in the narrative, the acreage of rocky slopes that are inaccessible to soil salvage. The Available Soil Resources Table in Section 232.100 lists 27.95 acres of topsoil salvage. The difference between the area to be disturbed (33.9 acres) and the area of soil salvage (27.95 acres) is 5.95 acres, which probably represents the acreage of rocky slopes that are inaccessible to soil salvage. If so, the application should clearly present this fact in the narrative.

## 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 Mine Wastes

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) in the location shown on Plate 5-6.

## Refuse Piles

The Permittee shows the location of the rock slope material on Plate 5-2. Section 520 (Refuse Piles) states that "a few hundred tons" of underground development waste, may be stored on site and transported for permanent burial at the Wildcat Loadout site. Section Appendix 5-7 refers to Plate 5-2 for the location of the Temporary Refuse Pile, but it could not be found.

Two rock slope tunnels will be constructed (Section 520). In Appendix 5-7, the Permittee explains that 28,000 cubic yards of excavated rock from tunnel development will be buried in a pit beneath the coal stockpile. There is no plan view or cross section provided. A brief description of placement of the rock slope material into pits is provided in App. 5-7. Subsoil will be replaced over the development waste (App. 5-7 and Section 232.500). The location for the Rock Slope Material shown on Plate 5-2 was mapped as XBS (Strych Extremely bouldery sandy loam 10 – 45% slopes) on Plate 2-3. This map unit has approximately 60+ inches of subsoil available, as represented by the pedon description of sample site LC3 in App. 2-3.

Upon reclamation, the development waste will be covered with four feet of (topsoil and subsoil) cover, complying with the requirements of R645-301-553.252 (Figure 2, Appendix 5-7). The Permittee will treat and dispose of all development waste as if the material were acid- or toxic-forming. All coal mine waste will be disposed of under four feet of material.

## Findings:

**R645-301-121.200**, Section 520 (Refuse Piles) and Appendix 5-7 both refer to a Temporary Refuse Pile. Please provide the location of the Temporary Refuse Pile on Plate 5-2.

## 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:

### **Acid- and Toxic-Forming Materials and Underground Development Waste**

The Permittee outlines the testing of coal mine waste in Appendix 5-7. The Permittee will test all rock slope material three times, which translates to about one test per 9,000 cu yards.

**TECHNICAL MEMO**

Previous permitting required five tests of the rock slope material or about one test every 5,000 cu yds. The Division will continue to require five tests that take place as follows: during the initial start up, at the ¼ mark, the ½ mark, and the ¾ mark and near completion of the rock slope tunnels. Samples will be analyzed for these parameters described in Table 1: pH, EC, SAR, boron, selenium, acid/base accounting, texture, water holding capacity, total nitrogen, nitrate nitrogen, and % organic carbon.

**Findings:**

The information provided does not meet the requirements for identifying acid/toxic material. Prior to approval, the Permittee must provide the following, in accordance with:

**R645-301-731.100**, The Permittee outlines the testing of coal mine waste in Appendix 5-7. The Permittee will test all rock slope material three times, which translates to about one test per 9,000 cu yards. Previous permitting required five tests of the rock slope material or about one test every 5,000 cu yds. The Division did not see a compelling reason to change the testing sequence and requests that the testing be described as previously agreed upon, with five tests that take place as follows: during the initial start up, at the ¼ mark, the ½ mark, and the ¾ mark and near completion of the rock slope tunnels.

**SUPPORT FACILITIES AND UTILITY INSTALLATIONS**

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

**Analysis:**

Plate 5-2 shows the facilities to be developed at the site. Plate 5-2 shows the powder and cap magazine storage site on the topsoil storage pile. Section 520 describes mobile, temporary powder and cap magazines.

Plate 5-2 shows a Run of Mine (ROM) storage pile containing approximately 200,000 Tons of open storage. The Permittee has included in Section 520 of the MRP several means by which deposition of coal fines on undisturbed slopes will be controlled:

- enclosed conveyor from the portal to the ROM storage pile.
- 80 ft stacking tube to control the drop of ROM coal.
- jersey barriers to prevent encroachment against the canyon slope.
- ROM stockpile will be 8 inch minus.
- water sprays at the head roller to moisten the coal as it falls into the pile.
- in-line crusher with covered conveyor from ROM to loadout bin.

- water sprays at all transfer points.

In addition, the deposition of coal fines onto undisturbed ground from the ROM storage pile will be visually monitored quarterly (Section 234.220 MRP – Part B). The plan states that if monitoring reveals coal fine deposition, then a vacuum truck will clean up coal dust. This is unacceptable. The operation plan should not allow for deposition to accumulate to the point where a vacuum truck is warranted, rather, the plan should state that at the first sign of deposition on undisturbed ground, water sprays on the open stockpile will be warranted as per General Condition #16 of the August 27, 1999 Approval Order (DAQE-702-99). In addition, if deposition of coal fines is persistent, then additional measures should be considered to prevent further coal fine deposition on undisturbed ground (i.e. wind fence).

### **Findings:**

The information provided does not meet the requirements of the Regulations. The Permittee must provide the following, prior to approval and in accordance with:

**R645-301-121.200**, Plate 5-2 shows the powder and cap magazine storage site on the topsoil storage pile. Please correct the plate to show the storage location for the explosives magazine adjacent to, but not on the topsoil storage pile.

**R645-301-526.222**, Deposition of coal fines onto undisturbed ground from the ROM storage pile will be visually monitored quarterly (Section 234.220 MRP – Part B). The plan states that if monitoring reveals coal fine deposition, then a vacuum truck will clean up coal dust. This is unacceptable. The operation plan should not allow for deposition to accumulate to the point where a vacuum truck is warranted, rather, the plan should state that at the first sign of deposition on undisturbed ground, water sprays on the open stockpile will be warranted as per General Condition #16 of the August 27, 1999 Approval Order (DAQE-702-99). In addition, if deposition of coal fines is persistent, then additional measures should be considered to prevent further coal fine deposition on undisturbed ground (i.e. wind fence).

## **RECLAMATION PLAN**

### **POSTMINING LAND USES**

**TECHNICAL MEMO**

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**Analysis:**

The postmining land use is in accordance with the BLM's management plans. Appendix 4-2 contains a letter from the BLM stating the postmining land use for the area is wildlife habitat, grazing, and incidental recreation. Should these plans change, the Permittee will accommodate the landowner (BLM) and Emery County at the time of reclamation (Section 412.140). There has been no changes made to the post mining land use plans with the detail design change amendment (Task 3017).

The reclamation plan is presented in Appendix 5-8 and Chapters 2, 3, and 5 of the PAP. The site will be monitored for 10 years prior to final bond release. Should monitoring indicate that livestock grazing is detrimental to the achievement of bond release, fencing the site will be considered along with supplemental seeding. There will be no roads left in the disturbed area.

SUWA previously commented that the PAP fails to restore the land to a quality capable of supporting wilderness designation. In the 2003 settlement with the State of Utah, the Secretary of Interior agreed that public lands other than Section 603 WSA's and Congressionally designated wilderness could not be managed or otherwise treated as wilderness study areas, absent congressional authorization.

SUWA previously commented that the restoration plan is inadequate to ensure that the water sources and other wildlife habitats will be returned to the postmining land use. These issues are addressed in the reclamation section of this TA.

**Findings:**

Information provided in the application meets the minimum Postmining Land Uses requirement of the regulations.

**TOPSOIL AND SUBSOIL**

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

**Analysis:**

**Redistribution**

The MRP describes in Section 241 grading the surface to Approximate Original Contour (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. There have been no changes to these plans with the detailed design change amendment, Task 3017, other than

volume of topsoil to be respread (66,000 cu yds). This volume of topsoil over the 34 disturbed acres will result in approximately 14 inches of topsoil replaced over the entire site.

The Permittee has provided Plate 2-3 outlining Soil Salvage and Replacement. In addition, the grading sequence is itemized in steps a through f. The sequence begins with: "a. Grade all areas where no subsoil is being stored. b. Replace subsoil on areas from which it was removed." Comments were previously made that the sequence as written was very confusing. Crucial to the understanding of steps a and b in the regrading sequence will be the As-Built map (Section 232.500) that will provide the operational location of the subsoils suitable for placement in the top four feet rooting zone. i.e. subsoil from soil map units SBJ, DSH and VBJ is identified in the Order 1 Soils Survey. The As-Built map is referred to in the discussion of Section 241 and 242.100 and 232.500. The Division understands and follows the concept of salvaging the subsoil and documenting its placement for use at final reclamation.

Comments were previously made on the depth of topsoil replacement, with interested parties believing that the MRP 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.

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 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 (see <http://www.cecer.army.mil/td/tips/product/details.cfm?ID=527> ).

An inoculum will be applied to the reclaimed soil surface to re-establish bacteria, mycorrhiza and mycelium in the soil. The MRP is not clear on what product will be re-applied to the soil to re-establish bacteria, mycorrhiza, and mycelium (Section 241), however the Division expects that the best technology available at the time of reclamation will be employed, as per R645-301-333.

Amendments will replace lost soil nutrients based upon testing of the topsoil stockpile prior to redistribution (Section 243). Four or five Grab samples will be collected to a depth of 18 inches from the stockpile the topsoil pile height is reduced to approximately 10 feet at its deepest end. These samples will be analyzed for nitrogen, potassium, and phosphorus (Section 243) The This method enables measurement of the bottom and middle portions of the stockpile rather than the surface.

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

**TECHNICAL MEMO**

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nitrogen was a detriment to the encouragement of native species. The application of fertilizer may be detrimental to the establishment of micro-organisms as well. Plant nutrients should be applied only in the case of severe deficiencies.

**Findings:**

The information provided in the application meets the requirements of the Regulations.

**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](http://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 16-16-8 fertilizer. 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.

There were no changes made to these stabilization plans with the detailed design change amendment, Task 3017.

**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:**

Approval is not recommended at this time. The deficiencies outlined in this memo should be addressed.

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