

# TECHNICAL MEMORANDUM

## Utah Coal Regulatory Program

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January 20, 2006

TO: Internal File

THRU: Joseph C. Helfrich, Environmental Scientist III/Biology, Team Lead

FROM: Peter Hess, Environmental Scientist III/Engineering

RE: LEASE ADDITION U-46484 & U-61049, CO-OP Mining Company, Bear Canyon Mines #3 and #4, C/015/0025, Task ID #2292

### **SUMMARY:**

The Permittee submitted an application to the Division on July 21, 2005 to add additional acreages to several of the Federal coal leases as well as fee coal. Those acreages and lease identification numbers include the following:

1) U-024316.....	80 acres
2) U-61049.....	2,196.09 acres
3) U-46484.....	1,400 acres
4) U-61048.....	1,108.27 acres
5) Fee Coal.....	2,740.00 acres
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Total Added Acreage.....	7,524.36 acres

This additional permit acreage will have a significant effect on the life of the Bear Canyon operation, increasing its permitted acreage from 3,336.18 acres to 10,840.54 acres. The 7,504.36 acres being added is being referred to as the Mohrland Addition.

This technical memo will address the adequacy of the application as it relates to the engineering discipline of the R645 coal rules.

### **TECHNICAL ANALYSIS:**

### **OPERATION PLAN**

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### MINING OPERATIONS AND FACILITIES

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

#### Analysis:

##### General

The Task ID #2292 submittal adds additional acreages of coal reserves to the Bear Canyon operation. There are no additional surface facilities anticipated at this time of application. All reserves are projected to come outside through the #3 Mine located in the Wild Horse Ridge addition of Bear Canyon.

##### Type and Method of Mining Operations

The submittal does not contain any change relative to the methods used for coal extraction at Bear Canyon. All coal extraction is performed through the use of continuous mining methods, as coal pillars are first developed and then recovered during the retreat process.

The application states that the operation will produce between 750,000 and 2,000,000 tons per year with two to four (continuous) miner sections working 360 days (See page 5-14, **Recovery Rate** of the application).

##### Facilities and Structures

The structures which exist at the Bear Canyon operation include the scale house / administration building, the maintenance shop, fuel storage tanks, coal processing tipple / truck loading facilities, ventilation fans for the Mines, electrical substation, above ground conveyors, sediment control devices, and topsoil storage piles. All are depicted on Plates 5-2A through 5-2G.

#### Findings:

The minimum regulatory requirements of this section have been met.

### EXISTING STRUCTURES

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

**Analysis:**

The Bear Canyon MRP contains photos and descriptions of the facilities that are in place at the site in Appendix 5-A. However, the appendix contains pictures of structures that have been reclaimed (photo #20, Tank seam borehole structure). Thus, Appendix 5-A is out of date. The Permittee needs to update Appendix 5-A to include all of the existing structures, as they currently exist at the Bear Canyon operation.

**Findings:**

The submittal is deficient. In accordance with the requirements of this section, the Permittee must provide the following:

**R645-301-526**, the Permittee must update Appendix 5-A, such that the photos and descriptions accurately depict all existing structures in service at the Bear Canyon Mines operations including all facilities for the #1, #3, and #4 Mines. All structures relative to the #2 Mine, Tank seam, which have been reclaimed should be designated as **RECLAIMED** if the Permittee desires to retain the photos within Appendix 5-A. [phh]

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

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

**Analysis:**

There are no mining activities being conducted or being proposed within 100 feet of a public road right-of-way. Although an Emery County road terminates at the Permittee's gate, same is a great distance from the mining activities being conducted. There is no need to relocate this road.

**Findings:**

This requirement is not applicable to this submittal.

## **COAL RECOVERY**

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

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**Analysis:**

Coal recovery is addressed on page 5-14, **Recovery Rate** of the Task ID #2292 submittal. Utilizing continuous miner advance and retreat techniques, a seventy percent recovery rate has been determined. Table 5-1, Coal Reserves – Bear Canyon Mine lists the in place tonnage, as well as the recoverable tons for six Federal coal leases (U-61048, U-61049, U-024316, U-024318, U-020668, and U-38727). Tonnages for the fee coal area are also listed.

The leases listed in Table 5-1 (and their associated tonnages) **DO NOT CORRELATE** with the leases listed in the cover letter of the Task ID #2292 submittal. The 1,400 acres associated with Federal lease U-46484 and the 2,740 acres of private property (fee coal) referred to in the cover letter are not listed in Table 5-1, Coal Reserves-Bear Canyon Mine. Thus, recoverable tonnages from these leases, (one Federal and one fee) is not included in the Total tonnage calculations, rendering them incorrect.

The Permittee has not provided any confirmation from the USDOJ / BLM / SLO that a resource recovery and protection plan (R2P2) has been developed, reviewed or approved by the Federal agency responsible for reviewing the efficient recovery of minerals from the associated Federal leases. The Permittee must provide a document indicating approval of these R2P2's to the Division prior to incorporating these leases into the Bear Canyon permit area.

The Permittee must provide documentation of the lease information for the 2,740 acres of fee coal that is being proposed for incorporation into the MRP.

**Findings:**

In accordance with the requirements of this section, the Permittee must provide the following:

- R645-301-522, Coal Recovery; 1)** a corrected Table 5-1, Coal Reserves-Bear Canyon Mine, which includes the in-situ as well as the recoverable tonnages for Federal lease U-024316 (80 acres of additional reserves), Federal lease U-46484 (1,400 acres of reserves), and the reserves associated with the private ownership fee coal, (2,740 acres of reserves). **2)** Confirmation from the USDOJ / BLM / SLO that the resource recovery and protection plan(s) is adequate for each of the Federal coal leases which is being proposed for addition to the Bear Canyon Mine permit area. **3)** A copy of the lease agreement between CO-OP Mining Company and the fee coal owner allowing right-of-entry into the 2,740 acres of private mineral ownership for the purpose of conducting coal extraction activities. This lease agreement should include a clause by which the coal owner accepts the recovery

factor of 70 percent as indicated on page 5-14 of the Bear Canyon mining and reclamation plan. [phh]

## **SUBSIDENCE CONTROL PLAN**

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

### **Analysis:**

#### **Renewable Resources Survey**

R645-301-525.110; The Permittee has not submitted the requirements relative to a pre-subsidence survey for the proposed lease area. This includes a map of any renewable resource lands in the proposed lease area, a narrative describing potential impact to the value of surface land, or State appropriated water supplies, a survey of survey of all non-commercial buildings and residential dwellings, a survey including quantity and quality of State appropriated water supplies. The application is deficient.

#### **Subsidence Control Plan**

Chapter 5, page 5iii, in the Bear Canyon MRP refers one to R645-301-525, page 5-16, section **525.300 Subsidence Control**, as being discussed in **Appendix 5F**. **Appendix 5F** discusses **Mine Roads**. It is not known where the Subsidence Control Plan is contained.

The Permittee has added monitoring points 51 through 57, as depicted on Plate 5-3, Subsidence Map. These points are all located in Federal lease U-61049, as follows:

- a) Point 51 is located in Section 13, T16S, R7E.
- b) Points 52, 53, 56, and 57 are located in Section 18, T16S, R8E
- c) Point 55 is located in Section 19, T16S, R8E
- d) Point 54 is located out side of the Federal lease boundary for U-61049 and U-38727.

Plate 5-3 has also been updated to show the potential subsidence zone for the lease additions.

R645-301-525.410; Method of Coal Removal

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The application does not contain a description of the method to be used to extract coal, which accurately depicts the size, sequence and timing of the development of the underground workings.

### R645-301-525.430; Description of Physical Conditions Affecting Subsidence

The application does not contain a description of the physical conditions that would affect subsidence within the proposed lease addition.

### R645-301-525.200, Protected Areas

The application does not mention any information relative to protected areas that may exist within the proposed lease addition.

## **Performance Standards For Subsidence Control**

Page 5-18, **Protection of Natural Surface Structures & Streams** of the Task ID#2292 submittal discusses the methods to be utilized by the Permittee to protect escarpments, raptors, and down stream water quality. The Permittee has modified the commitment **“to maintain a min (minimum) of 200 ft (foot) barrier pillars (adjacent) to outcrops”** in order to minimize escarpment failure is being proposed for modification to include the verbiage **“where required by lease stipulations”**. This seems to be reasonable, but the Division has the following concern; much of the coal outcrop in the Wild Horse Ridge addition is burnt. **Coal burn has no supporting strength**; therefore a 200-foot barrier pillar adjacent to an outcrop is meaningless as far as its capability to “minimize the possibility of escarpment failure and resulting detrimental impacts to downstream water quality or nesting raptors”. Furthermore, the location of this 200-foot barrier (**which the Division has determined does not exist at the outcrop, but between the active mine workings and the inside edge of the coal burn**) could have little if any effect on actually supporting any escarpment. This was determined by overlaying Plates 5-1A and 5-1C on Plate 5-3, Subsidence Map. The area of coal burn is depicted on Plates 5-1A and 5-1C. Of concern here is the accuracy of the coal burn delineation on these maps, and how the lines of burn were determined. **The Permittee must describe how the location of this 200-foot barrier is determined for plotting on the associated maps. Also, the description must describe how the locations of the barriers are correlated with the locations of the surface features that are being protected.**

The Permittee, in conjunction with the USDOJ /BLM /Utah State Office, and the USFS must coordinate their efforts relative to protection of escarpments and maximizing coal recovery from the Blind Canyon and Tank seams.

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In order to do this, the following is recommended:

- a) The Permittee must clarify / modify the language on page 5-18, specifically stating that the 200 foot barrier is located between the mine workings and the inside edge of the coal burn.
- b) The Permittee, in coordination with the USFS, and the BLM Utah State office must identify on a map where escarpments exist which require protection, and where the leaving of coal barriers of sufficient strength and size would be required to support same.
- c) The Permittee must correlate the location of the surface feature requiring protection with the location of the barrier pillar being left. This must be shown on a map depicting the associated mine workings.
- d) The Permittee must provide a general geotechnical analysis for all designed protection barriers. Protection zones for escarpments must be designed including considerations for depth of cover, angle of draw, coal strengths, etc. This analysis **must include a description of the method that the Permittee uses to locate and determine the extent of the coal burn in each associated coal seam.**

If an escarpment exists, an engineering analysis would determine if the leaving of a barrier would actually provide protection for the surface feature. This may improve coal recovery, as the Permittee would be able to initiate retreat at the edge of the coal burn. The engineering analysis must provide sufficient information including:

- a) A correlation of the location of the surface feature requiring protection with the location of any protection barrier.
- b) Aerial photographs of the surface features correlated with maps of the underground mine workings to determine if the leaving of coal barriers will protect any important surface features.
- c) A map that would correlate the locations of escarpments requiring protection, and the amount of coal burn into the mountain from the outcrop.

This map may show that coal burn exists to the extent that a designed protection zone would not protect the escarpment, no matter the size, (i.e., the escarpment would be well within a burn area, and standard methods of protection zone design would show that the escarpment could not be protected).

Protection zones will have to be designed through coordination with the BLM, the USFS, and the Permittee. Mining in protection zones may be possible with a limited extraction ratio. Sufficient coal would remain to provide support for escarpments, minimizing impacts to nesting raptors and potential impacts to downstream water quality. The reduced coal recovery would need approval through the Federal leasing Resource Recovery and Protection Plan (R2P2).

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The Permittee currently has recently submitted two permit amendments to the Division that require the leaving of barrier pillars, where escarpments do not exist. By making the protection barriers a condition of each individual lease, the utilization of the coal resource will be further maximized. There will be no visual impact to the surface via escarpment failures, and nesting raptors will be protected. Downstream water quality will not be affected.

Bear Creek flows through a mineable portion of Federal lease U-024316. This submittal is proposing to add 80 acres of reserves to this lease. Page 1-7 provides the legal descriptions for the lease areas to be added / approved by this submittal. The eighty acres being added to Federal lease U-024316 is the E1/2 NW1/4, which is more than a thousand feet from the Bear Creek channel. Therefore the precautions used by the Permittee are not applicable to the area where the eighty acres are being added to the Bear Canyon permit area.

**Notification**

The Permittee needs to provide a projection map of the #4 and #3 Mine workings depicting the anticipated dates when development mining will cross into the proposed lease additions. This map must also show the surface landowner delineations and section lines (i.e., the mapped legal description) such that the required notification letters can be sent in the time frame mandated under **R645-301-525.700**. The Permittee must commit to updating this underground projection map at least annually.

**Findings:**

The application does not meet the minimum regulatory requirements of this section. In accordance with the requirements of this section, the Permittee must provide the following:

**R645-301-525.110, 525.110, 525.120, 525.130, R645-301-525.200 et al., R645-301-525.300, R645-301-525.400 et al., R645-301-525.500, et al.;** The Permittee must address these requirements as they relate to the proposed lease addition. [phh]

**R645-301-525.450, 525.452, 525.453,** the Permittee must develop a better method to describe how natural surface structures will be protected where they exist in areas where coal burn exists, or show that the natural surface features cannot be protected using accepted geotechnical engineering methods. This would be determined by relating the location of the surface feature with respect to the amount of coal burn in that area. [phh]

**R645-301-525.700, Public Notice of Proposed Mining**, the Permittee must provide the Division with a map which correlates the features of Plate 1-1, Permit Area, showing the various lease boundaries, Plate 1-2, Surface Ownership, and Plates 5-1A and 5-1C, Blind Canyon Seam and Tank Seam Mine workings. Although Plates 5-1A and 5-1C depict anticipated mining dates for secondary extraction of pillar panels, there are no anticipated dates shown for development mining. 525.700 requires that surface landowners be notified “at least six months prior to mining”, i.e., development mining. Therefore this map is necessary to ensure that the surface landowners are notified in the time frame required. [phh]

## **SLIDES AND OTHER DAMAGE**

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

### **Analysis:**

This section has been addressed in the approved mining and reclamation plan.

### **Findings:**

The information provided has received a previous approval, as it has met the minimum regulatory requirements of this section.

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

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

### **Analysis:**

#### **Road Classification System**

All eleven roads within the Bear Canyon Mines disturbed area have been classified as primary, (See page 5-21, section **R645-301-527 Transportation Facilities** of the approved MRP). All roads associated with the lease additions are the property of the surface landowner.

As such surface roads in Federal leases U-024316, U-46484, U-61048 and U-61049 are owned either by the Forest Service or the C. O. P. Coal Development Company.

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If the Permittee has a need to utilize any FS roads in the future, it will be necessary for them to obtain a Road Use Permit from that agency.

**Plans and Drawings**

Maps, plans and drawings of the eleven primary roads within the Bear Canyon Mine disturbed area are contained on Plates 5-2 and 5-4, as well as Appendices 5-J and 5-K.

Chapter 5, page 5-21 of the Bear Canyon MRP makes the following statement; “construction of the Mohrland Road is discussed in Appendix 5-L.” At the present time, Appendix 5-L does not exist. The Permittee intends to do this permitting in the future. Plans and drawings will be submitted at that time.

**Primary Road Certification**

Plates 5-2A-G depict the plan views of the surface facilities associated with the Bear Canyon Mines from the ball park area to the #'s 1, 2, 3 and 4 Mine portal areas. Thus, all of the eleven primary roads are depicted. Mr. Charles Reynolds, General Manager, and Utah registered professional engineer has placed his P.E. certification on each of these maps. Similarly, Plate 5-4A-D contains cross-sections and P.E. certifications for the primary access road (coal haul road / Bear Canyon), the Shop road and pond “A” access road (4B), the shower house road and #2 Mine road (reclaimed) ((4C)), and the #1 and #2 conveyor access roads, and the #3 Mine access road in the Wild Horse Ridge area, (4D).

Appendix 5-K contains cross sections and stability analyses for the #4 Mine, or Tank seam primary road. Neither the road design nor the stability analyses have a certification by a Utah registered professional engineer. Thus the requirements of R645-301-512.200 have not been met.

**Findings:**

The minimum regulatory requirements of this section have not been met. In accordance with the requirements of this section, the Permittee must provide the following:

**R645-301-512.250, Primary Roads**, the Permittee must either submit an “as-built” design for the #4 Mine Tank seam access road and portal pad, or have the project engineer performing the analyses in Attachment B of Appendix 5-K certify the existing report/analyses. The design that is submitted must be certified by a Utah registered professional engineer. [phh]

## **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:**

#### **Coal Mine Waste**

Page 5-26 of the Task ID# 2292 application contains one text change on page 5-26. That change proposes to change the location for the final disposal of coal mine waste from the #3 and #4 Mines from Slurry Pond 5A at the Hiawatha Complex (C/007/011) to Refuse Pile 1 (MSHA ID #1211-UT-09-02157-04) at the same site. Refuse Pile 1 is adjacent to and NE of the old railroad depot / station location at the Hiawatha site.

The Division should make sure that the Permittee has changed the location for final deposition of the Bear Canyon waste in the Refuse Pile #1 area of the Hiawatha permit in that respective mining and reclamation plan.

#### **Refuse Piles**

As previously noted, all coals produced in the #3 and #4 Mines will be brought to the surface out of the #3 Mine belt portal. Coal processing waste will be generated at the Bear Canyon tipple, and material that is not picked off, and crushed for use as road base underground will be shipped to the Hiawatha permit area (C/007/011) for final disposal in Refuse Pile #1.

#### **Impounding Structures**

There are no impoundments associated with the Task ID# 2292 application.

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**Burning And Burned Waste Utilization**

This section is not applicable to this amendment.

**Return of Coal Processing Waste to Abandoned Underground Workings**

Coal processing waste will not be returned to abandoned underground workings.

**Excess Spoil:**

No spoil is generated at the Bear Canyon mining operation.

**Findings:**

The minimum requirements of this section have been addressed.

**SUPPORT FACILITIES AND UTILITY INSTALLATIONS**

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

**Analysis:**

Appendix 5-A, as it exists in the reformatted mine plan for the Bear Canyon site (Task ID #2114), contains Table 5A-1, Existing Structures. Table 5A-1 contains the following structures that have been listed as “proposed”:

- a) WHR Blind Canyon Seam Fan
- b) Wild Horse Ridge Conveyor Belt(s)
- c) WHR Substation
- d) WHR Retaining Wall
- e) WHR Water and Fuel Tanks
- f) WHR Coal Storage Bin
- g) Power Lines
- h) Water Lines
- i) Portable Fan
- j) Fuel Containment Enclosure
- k) Tank Seam Borehole Structure.

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The above structures are listed as proposed, or reclaimed. Many of these have since been constructed yet no photos have been submitted for implementation into the MRP.

Some structures have been constructed, which were not included in the “proposed” list. This includes the #4 Mine (Tank seam) fan installation, Wild Horse Ridge addition. Other facilities may need to be added to bring Table 5A-1, and the photos included in Appendix 5A up to date.

### **Findings:**

The application is deficient. In accordance with the requirements of this section, the Permittee must provide the following:

**R645-301-526, Facilities and Structures**, the Permittee must update Appendix 5A, including Table 5A-1, and submit photographs of any constructed facilities in the Wild Horse Ridge addition to make this information in the mining and reclamation plan current. Information relative to structures that have been reclaimed should be removed. [phh]

## **SIGNS AND MARKERS**

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

### **Analysis:**

The requirements of this section have been addressed within the currently approved mining and reclamation plan for the Bear Canyon operation.

### **Findings:**

The minimum regulatory requirements of this section have been previously addressed.

## **USE OF EXPLOSIVES**

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

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### Analysis:

There are no proposed changes to the sections listed below;

### Findings:

The minimum regulatory requirements of this section have been previously addressed.

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

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

### Analysis:

#### Affected Area Maps

Revised maps that have been submitted relative to this application include Plate 1-1, Permit Area Map, and Plate 5-3, Subsidence Map.

#### Mining Facilities Maps

Plates 5-2A through 5-2H are contained in the Bear Canyon reformatted mining and reclamation plan, which has yet to be approved by the DOGM, as of September 28, 2005.

#### Mine Workings Maps

Mine workings are depicted on Plates 5-1A and 5-1C for the Blind Canyon seam (#3 Mine) and the Tank seam (#4 Mine) respectively. The Plates **are not certified** by a Utah registered professional engineer.

Plates 5-1A and 5-1C show the anticipated dates of secondary extraction for the mining sections in the Blind Canyon and Tank seams respectively. The Permittee must submit a similar projection map for the development of the Mines, such that the requirements of **R645-301-525.700** can be met. Thus, this required map must also show lease boundaries and surface ownership relative to those leases.

### **Monitoring and Sampling Location Maps**

Plates 7-4A, Spring Canyon Potentiometric Surface, 7N-2, Water Sampling Locations and 7-4, Water Monitoring have been submitted as part of the Task ID#2292 application.

Plate 5-3, Subsidence Map depicts subsidence monitoring station locations, escarpment locations, potential subsidence zones, and mine workings for the #1 and #2 Bear canyon Mines. **Mine workings for the active mines are not shown.** It is these areas of potential subsidence that are of interest to this application. Therefore, Plate 5-3 Subsidence Map needs to be revised to show the active mining operations.

None of the submitted plates have been certified by a Utah registered professional engineer.

### **Certification Requirements**

None of the submitted plates have been certified by a Utah registered professional engineer.

### **Findings:**

The application is deficient. In accordance with the requirements of this section, the Permittee must provide the following:

**R645-301-512.110, Mine workings to the extent known;** Plates 5-2A and 5-2C must be certified by a Utah registered professional engineer. [phh]

**R645-301-512.140, Hydrology** as described under R645-301-722, and as appropriate, R645-301-731.700 through R645-301-731.740, the aforementioned plates must be certified by a Utah registered professional engineer prior to the resubmittal. [phh]

**R645-301-525.700, Public Notice of Proposed Mining;** the Permittee must submit a mining projection map which shows the anticipated dates for Mine development in the Blind Canyon and Tank seams of the Wild Horse Ridge addition area of the Bear Canyon permit. This map must also show the leases, and the surface lands owners above those leases such that the requirements of R645-301-525.700 can be met. [phh]

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## **RECLAMATION PLAN**

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

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

#### **Analysis:**

##### **Certification Requirements.**

None of the cross sections for the cut and fill drawings shown in Appendix 5K, Attachment A are P.E. certified. These include the following:

- a) TS-16, Sections 1,2,3 and 4
- b) TS-17, cross sections 0+00 through 3+50.

These cross sections depict both the pre-mining and post-mining surface configurations and as such, are considered as part of the requirements meeting final surface configuration maps, as well as reclamation backfilling and grading maps. "As built" of the reclamation work including an aerial view drawing will be required post-reclamation.

#### **Findings:**

The application is deficient. In accordance with the requirements of this section, the Permittee must provide the following:

**R645-301-512.130**, all maps depicting final surface configurations or are relative to meeting the requirements for backfilling and grading must be certified by a Utah registered professional engineer. [phh]