

TECHNICAL MEMORANDUM

Utah Regulatory Coal Program

#3407
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December 1, 2009

TO: Internal File

THRU: April Abate, EnSci II / Geology / Hydrology / Team Lead *AAA 12-16-2009*
James D. Smith, Permit Supervisor / Task Manager *JS 12/16/09*

FROM: Peter H. Hess *PHH bus SDS*

RE: MIDTERM PERMIT REVIEW, Canyon Fuel Company, LLC, SUFCO Mine, C/041/002, Task ID # 3407

SUMMARY:

The Division initiated a mid-term permit review of the SUFCO Mine mining and reclamation plan on September 21, 2009. An inspection of the East Spring Canyon surface facilities, the roadside waste rock facility, the new sediment pond location, and the three areas of disturbance in Link Canyon was made by the DOGM technical review team on November 18, 2009.

This tech memo will address the adequacy of the subsidence control / monitoring plans, their respective reporting requirements, variances to the requirements of approximate original contour restoration, and the adequacy of the amount of posted reclamation bond.

TECHNICAL ANALYSIS

OPERATION PLAN

SUBSIDENCE CONTROL PLAN

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

Analysis:

Renewable Resources Survey

Renewable resource lands within the permit area are shown on Plates 4-1A and 4-1B. 1B is the area where mining activities are currently occurring, and the surface areas depicted cover the coal reserves in the Pines tract and the SITLA Muddy Tract. Plate 4-1B was last updated in May of 2007.

Plates 4-1A and 4-1B are certified by Mr. John D. Byers, Utah registered professional engineer, and Manager of Technical Services for the Permittee.

Subsidence Control Plan

The subsidence control plan for the SUFCO Mine is contained in Volume 1, Chapter 5, page 5-23, Section 5.2.5.1. From June 1976 until October of 1985, the Permittee utilized continuous mining methods as the means of secondary extraction of pillars. In 1985 longwall mining methods were implemented, and that method of secondary extraction is still in use today.

Longwall mining is a method of mining that provides for planned subsidence in a predictable and controlled manner.

Performance Standards For Subsidence Control

Subsidence monitoring and subsidence crack monitoring are permit conditions established in Chapter 5, pages 5-29 , 30 and 39.

The Permittee started collecting baseline topographic data for the permit area in 1976, prior to the onset of pillar extractions using continuous mining methods. This continued until 1985, when aerial surveys were initiated to perform deformation analyses.

The use of color infrared (CIR) photography was initiated in 1987 to monitor changes in the vegetative cover for the coal leases. To date, CIR surveys have been completed in 1990, 1995, 1999, 2003 (East Fork of Box canyon only), 2004, and 2008. Future CIR surveys will be conducted in 2013 and 2018.

Aerial surveys are conducted annually to determine elevation changes over areas where secondary extraction has occurred.

The Permittee submits this collected / analyzed subsidence monitoring data to the DOGM every year as part of the Annual Report. The current data (2008) is contained in Appendix B, with the subsidence isopach map located in Appendix D, (2008 Annual Report). The isopachs show the deformation contours along the lines of equal settling.

The subsidence data contains information for 13 areas, eleven of which are considered dormant (i.e., deformation has reached its maximum). Areas 12 and 13 saw secondary extraction in 2007, and the Permittee continues to monitor those areas until it is determined that maximum deformation has been achieved. The Permittee continues to monitor the areas where it has been determined that maximum deformation has been achieved for a minimum of three years.

Four feet of subsidence was measured in the center of the first panel extracted in Area 13 (2007).

A program to monitor surface cracks above the extraction areas was developed and implemented in 2000. Width, displacement and location of cracks observed in the West fork of Box Canyon were either not documented or not kept. Data collection and record keeping were initiated in the Fall of 2004 and have been completed every year since. Crack measurement records are now submitted with the Annual report subsidence monitoring data.

Crack monitoring on the surface was completed in the West Fork of Box Canyon in May of 2008. Additional time was needed to complete this requirement due to snow depths in the area.

Portions of the East fork of Box Canyon were undermined from 2003 through 2005. The implemented crack monitoring program for this area was more intensive than that implemented in the general mine permit area as the following methods of analysis were implemented;

- 1) vegetation monitoring
- 2) monitoring of surface and ground water flows by video taping the condition of the stream channel
- 3) monitoring of subsidence cracks
- 4) repair of cracks using bentonite

Two video tapes have been made of the East Fork channel documenting crack conditions (second tape made during 2008).

There are 10 crack monitoring locations, and the Permittee documents the vertical displacement and the width of separation at each station. 4 of the 10 sites monitored in May of 2008 had zero displacement.

Frequent checks of the East Fork of Box Canyon were made during and after active subsidence.

The Permittee has also implemented a subsidence monitoring and mitigation plan for the South Fork of Quitcupah which is similar to the West and East Fork of Box Canyon plans.

Crack locations are documented on the subsidence map submitted as Appendix D in the annual report.

Notification

Section 5.2.5.3, **Public Notice of Proposed Mining**, page 5-42, Chapter 5 contains the following commitment; “should new lease areas be added to the SUFCO Mine, a public notice of proposed mining activities will be mailed to all owners and occupants of the affected surface property and structures above the proposed underground workings. The notification will include identification of specific areas in which mining will occur, dates that specific areas will be undermined, and the locations where SUFCO Mine’s subsidence control plan may be examined.”

The Permittee provided the Division with two letters of notification prior to onset of mining activities in the SITLA Muddy Tract Lease on January 23, 2006. This was at least one year before development mining was initiated beyond the Quitchupah lease (which was initiated during 2007). The two agencies contacted were the Emery County Water Conservancy District and the USDA / Manti LaSal National Forest.

Both the Manti LaSal National Forest and the Fishlake National Forest have copies of the SUFCO Mine mining and reclamation plan on file.

The public notice of proposed mining activity letters meet the requirements listed in R645-301-525.700, which are as follows;

- 1) at least 6 months prior to initiation of mining activities;
- 2) notification to water conservancy district;
- 3) notification to surface property owners above underground works;
- 4) notification to structure owners above underground works;
- 5) identification of specific areas to be mined;
- 6) dates when mining is anticipated;
- 7) locations where mine subsidence control plan may be reviewed.

Findings:

The SUFCO Mine mining and reclamation plan provides adequate information relative to R645-301-525, Subsidence Control Plan, and R645-301-525.440, Description of the Monitoring.

The Permittee utilizes mining technology (retreating longwall extraction method), which provides for planned subsidence in a predictable and controlled manner.

The Permittee monitors, identifies and reports effects of subsidence, which have propagated to the surface, and takes a pro-active approach to repair any effects which are identified as needing repair.

APPROXIMATE ORIGINAL CONTOUR RESTORATION

Regulatory Reference: 30 CFR Sec. 784.15, 785.16, 817.102, 817.107, 817.133; R645-301-234, -301-412, -301-413, -301-512, -301-531, -301-533, -301-553, -301-536, -301-542, -301-731, -301-732, -301-733, -301-764.

Analysis:

The Permittee has not requested any variance from the requirements of Approximate Original Contour for the reclamation of the disturbed areas associated with the SUFCO Mine.

Section 5.5.3.6 Approximate Original Contour in the SUFCO Mine mining and reclamation plan indicates that final reclamation contours are depicted on Plates 5-3A and B. The Permittee states that several cut slopes will be left along the western edge of the existing pad area (this is the East Spring Canyon surface facilities area) based on the following factors:

- 1) the retained cut slopes are not significantly greater in height or length than the dimensions of existing cliffs and the surrounding area
- 2) the residual cut slopes are similar in structural composition to the pre-existing cliffs in the surrounding area and are compatible with the visual attributes of the area;
- 3) the residual cut slopes are compatible with the geomorphic processes of the area.

Section 5.4.2.3 Final Surface Configuration Maps and Cross Sections

Plates 5-3A, and 5-4 depict the reclamation contours, which will be approximated during the reclamation of this Mine's East Spring Canyon surface facilities. 5-4 contains six cross sections, A-A' through F-F' for this area.

Plate 5-3A shows the anticipated plan view contours for the three areas of disturbance located in the lower Canyon, i.e., the spring collection field, the pump house area, and the sewage treatment / leach field.

All aforementioned information is part of the approved mining and reclamation plan for the SUFCO Mine.

Section 5.4.2.2 Plan for Backfilling, Soil Stabilization, Compacting and Grading, (See Chapter 5, page 5-65 of the Mining and reclamation Plan) contains information for the following areas of disturbance at SUFCO;

- a) roadside waste rock disposal facility (See volume 3);

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- b) Link Canyon Portal area (one portal) (second portal is pre-SMCRA and has not been disturbed since pre-SMCRA reclamation);
 - c) Link Canyon substation #1 (reclaimed);
 - d) Link Canyon substation #2.

based on text provided on Page 5-67 of the MRP, these areas will be restored according to the following specifications;

- a) "the pre-existing slopes will be restored"
- b) "in accordance with Approximate Original Contour regulations"
- c) "use all fill material stored"
- d) "slopes will be constructed using ...trackhoes and dozers..."
- e) "fenced".

The disturbed areas are located in a steeply sloped narrow canyon.

Although the MRP contains text describing how Substation #2 and Link Portal #1 will be reclaimed, the MRP does not contain final surface configuration maps or cross-sections for these two affected areas, (See **R645-301-542.200** and **542.300**).

Also, no discussion can be found in the MRP, which is relative to how the following areas will be reclaimed;

- a) the Quitchupah portals
- b) the 4th East fan portal pad.

The Division realizes that these areas will require a reclamation plan that must be conducted from within the Mine, similar to the reclamation that was performed at the South portals location.

The plan is deficient.

The Permittee must submit the following in accordance with the requirements of:

1) R645-301-542.200 Plan for Backfilling, Soil Stabilization, Compacting and Grading

The Permittee must submit a plan describing how the following areas will be backfilled, re-shaped and sealed in order to meet the requirements of approximate original contour;

- 1) the Quitchupah portals
- 2) the 4th East fan portal pad

The Division recommends that section **5.4.2.2 Plan for Backfilling, Soil Stabilization, Compacting and Grading** of the SUFCO Mine MRP be updated to include this additional information.

2) R645-301-542.300, 542.310 Final Surface Configuration Maps and Cross Sections

- 1) post-reclamation “as-built” drawings for the Link Canyon Substation #1 location
- 2) “anticipated” final surface configuration drawings with cross-sections for the
 - Link Canyon #2 substation, and
 - the Link Canyon Intake Portal
 - Quitchupah portals
 - iv. 4th East Fan Portal and Pad

Findings:

The Permittee needs to provide plans and drawings to show how the areas identified above will be reclaimed and to what configuration.

RECLAMATION PLAN

BONDING AND INSURANCE REQUIREMENTS

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

Analysis:

General

The Permittee submitted an application to the Division on August 27, 2009 (Task ID # 3341) to permit a New Sedimentation Overflow Pond in the lower Canyon below the Mine site sediment pond. As part of this application, the Permittee submitted revised / updated costs for the reclamation which included demolition, earthwork and revegetation costs. The Division reviewed and approved these updated costs for the new pond.

Form of Bond

The type of bond currently held by the Division for the reclamation cost of the SUFCO Mine is a surety bond issued by the Argonaut Insurance Company in the amount of \$ 4,439,000. The Argonaut Insurance Company has an AM Best rating of "A".

Determination of Bond Amount

The following cost increases were determined for the SUFCO Mine in order to include the new sedimentation pond;

Subtotal Demolition and Removal	\$ 1,052,417.00
Subtotal Backfilling and Grading.....	\$ 548,005.00
Subtotal Revegetation.....	\$ 171,967.00
Direct Costs.....	\$ 1,772,389.00
Subtotal Indirect Costs (26.8 %).....	\$ 475,000.00
Total Reclamation Cost.....	\$ 2,247,389.00
Escalation over 4 years.....	\$ 426,514.00
Total Mine Reclamation Cost (2009 dollars).....	\$ 2,673,903.00
Escalation to 2014 Dollars (5 X 1.013).....	\$ 178,356.00
Escalated Reclamation Cost.....	\$2,852,259.00
Cost Rounded to nearest \$1,000.....	\$2,852,000.00
Posted Bond.....	\$ 4,439,000.00
Difference Between Cost Estimate and Bond.....	\$ 1,587,000.00
Percent Difference.....	35.75 %

Findings:

The currently posted bond amount of \$ 4,439,000.00 exceeds the escalated reclamation cost to 2014 dollars by \$ 1,587,000.00 or 35.75 %. The Permittee has adequate bond in place to reclaim this site through the next five years.

RECOMMENDATIONS:

The midterm permit review identified the following deficiencies:

[R645-301-542.200]: Plan for Backfilling, Soil Stabilization, Compacting and Grading. The Permittee must submit a plan describing how the following areas will be backfilled, re-shaped and sealed in order to meet the requirements of approximate original contour:

- Quitchupah portals
- 4th East fan portal pad

The Division recommends that section **5.4.2.2 Plan for Backfilling, Soil Stabilization, Compacting and Grading** of the SUFCO Mine MRP be updated to include this additional information.

[R645-301-542.300-310]: Final Surface Configuration Maps and Cross Sections. Provide plans and drawings to show how the areas identified above will be reclaimed and to what configuration:

- 1) Post-reclamation “as-built” drawings for the Link Canyon Substation #1 location
- 2) “Anticipated” final surface configuration drawings with cross-sections for the
 - Link Canyon #2 substation, and
 - Link Canyon Intake Portal
 - Quitchupah portals
 - 4th East Fan Portal and Pad