JON M. HUNTSMAN, JR.
Governor

GARY R. HERBERT
Lieutenant Governor

State of Utah

Department of Natural Resources

MICHAEL R. STYLER
Executive Director

Division of Oil, Gas & Mining

JOHN R. BAZA
Division Director

June 30, 2005

James Fulton, Chief
Office of Surface Mining
1999 Broadway, Suite 3320
P.O. Box 46667
Denver, Colorado 80201-6667

Subject: Request for Concurrence on an Experimental Practice at Proposed Rilda Canyon Facility, PacifiCorp, Deer Creek Mine, C/015/0018, Outgoing File

Dear Mr. Fulton:

The proposed Rilda Canyon Facility for the Deer Creek Mine includes an application to use an experimental practice. In accordance with our regulations at R645-302-210 and OSM Directive Reg-7, attached are the Division technical findings, and we request your concurrence on this proposal.

The Experimental Practice at the proposed Rilda Canyon facility involves topsoil protection on steep slopes and over previously buried mine waste. The proposal will leave soil in-place beneath a subsoil stockpile. We believe the applicant has provided adequate plans for protecting topsoil resources which will accomplish the objectives of SMCRA and will result in better reclamation than would occur using conventional salvage and replacement techniques.

Please contact us if there is any other information that you need to evaluate this project. If you have any questions or need more information please contact me at (801) 538-5306 or Pamela Grubaugh-Littig at (801) 538-5268.

Sincerely,

/S/

Mary Ann Wright
Associate Director, Mining

an
Enclosure
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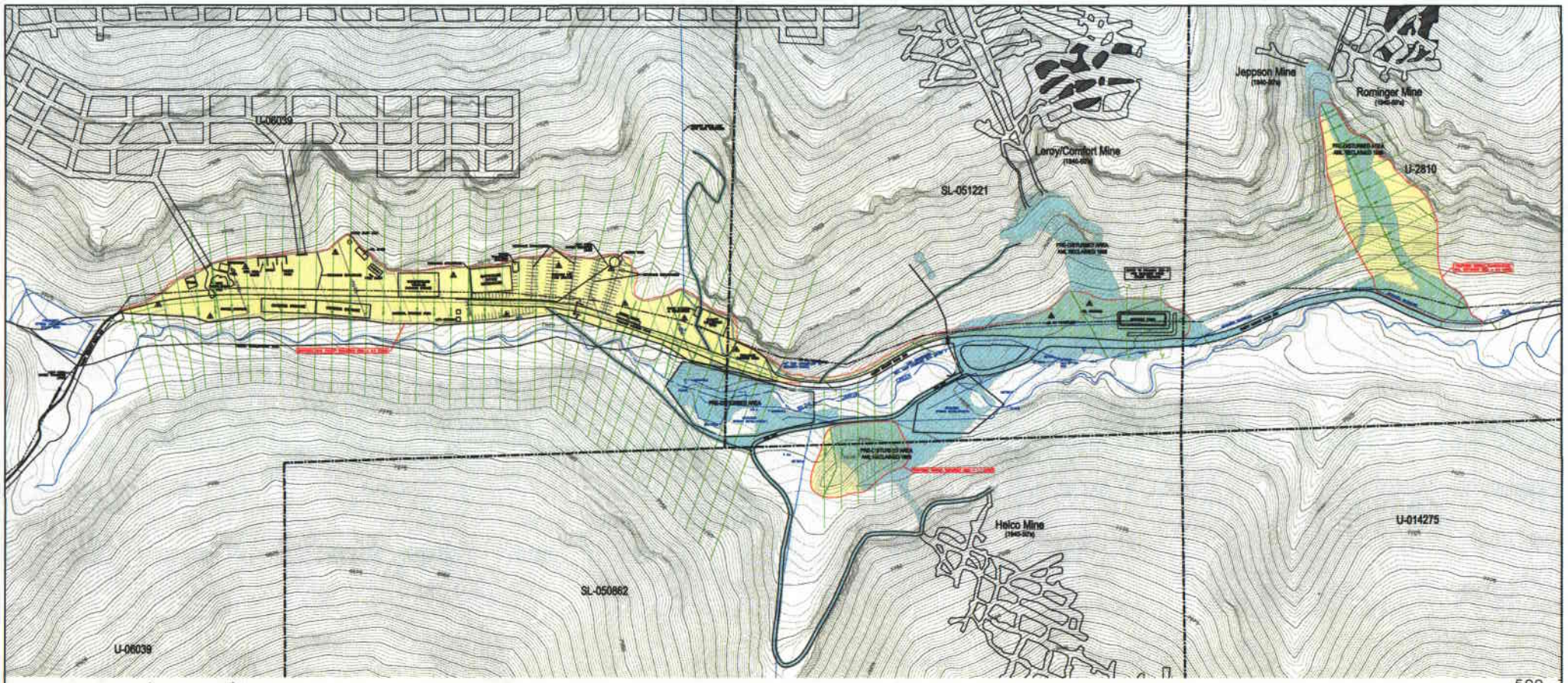

TYPICAL PRIMARY ACCESS ROAD SECTION A–A'

LEGEND

PROPOSED DISTURBED AREA

PRE-DISTURBANCE AREA

SNOW STORAGE SITE

NOTES:

1. REFER TO PLATE 500-4 SHEETS 1 THROUGH 5 FOR CROSS SECTIONS
2. REFER TO SECTION R645-301-521.100 LAND SURFACE CONFIGURATION MAP, FOR MASS BALANCE TABLES
   - ENGINEERING SECTION TABLE 500-1 CONSTRUCTION MASS BALANCE
   - ENGINEERING SECTION TABLE 500-2 RECLAMATION MASS BALANCE

5-22-09	ADDED FOR CDA/REVISED WASTE ROCK NOTE	KJL
11-10-04	ADDED ROMINGER MINE AREA TO MAP	KJL
10-20-04	REVISED NOTES AND PLOT MARKER	KJL
8-2-04	REVISED CONTOUR ELEVATION NOTATIONS	KJL
DATE	REVISION	BY CHK

ENERGY WEST MINING COMPANY

DEER CREEK MINE
RILDA CANYON
SURFACE FACILITIES

DRWG. BY: K. LARSEN | 500-3

SCALE: 1"=100' | DRWG. #

DATE: AUGUST 20, 2004 | SHEET 1 OF 1

Photo A:
Rominger Mine

EXPERIMENTAL PRACTICE AT THE PROPOSED RILDA CANYON FACILITY, DEER CREEK MINE

June 30, 2005

Regulatory Reference: 30 CFR Sec. 785.13; R645-302-210, -302-211, -302-212, -302-213, -302-214, -302-215, -302-216, -302-217, -302-218.

Analysis:

Chapter 2, Soils, incorporates traditional methods of salvaging/stockpiling and an experimental practice method for protecting soils in-place. The Experimental Practice is unique by taking a reclamation approach to topsoil protection on steep slopes and over previously buried mine waste. In addition, the experimental practice includes: 1) measurements of bulk density testing of the in-place soils on slopes less than 2h:1v, before and after burial, to advance understanding of the depth of compaction created by large stockpiles on surface soils; and 2) treatment of slopes greater than 2h:1v with anionic polyacrylamide (PAM) to enhance stability and water retention.

Operations - Experimental Practices

An Experimental Practice is described at the end of Chapter 2, Vol. 11 of the Deer Creek Mining and Reclamation Plan. Energy West Mining proposes a topsoil protection plan that incorporates Experimental Practices (R645-302-200) for in-place soil storage beneath a subsoil stockpile. The experimental practice will occur in Rominger Canyon where a subsoil pile with dimensions 550 ft long X 250 ft wide X 40 ft deep (on the average) will be constructed to hold 107,000 yd^3 of subsoil and where boulders will be stored until use during reclamation.

The 3.0 acre experimental practice area will be covered with marker fabric fabric. The fabric will provide a physical barrier between existing soil and the imported stored subsoil. During final reclamation the marker fabric will be removed and slopes greater than 50% will be treated with polyacrylamide (PAM). The PAM should enhance infiltration of water and stabilize soil aggregates to improve vegetation establishment and minimize erosion of the re-exposed, reclaimed slopes. By utilizing these procedures, the original ground surface configuration including cobbles, rocks, and soil cementation of the profile will be preserved in place. The experimental practice monitoring will provide an indication of the degree of compaction related to the loading of the in place soil through measurements of the bulk density of the in-place soil before and after burial.

Existing Soil Resources

The experimental practice will occupy 3.0 acres. (There are no prime farmlands in the vicinity.) Within these 3.0 acres, there is an undisturbed area of 1.6 acres and the remainder of the 3.0 acres (1.4 acres) contains mine waste that was reclaimed in 1989 with approximately 18 inches of cover soil (see attached Map 500-3). The attached photo of the Rominger mine side canyon is from Vol.11-Appendix – Engineering Appendix G.

The 1.6 acres of undisturbed soils on the slopes around the reclaimed Rominger disturbance is represented by soil sample site RC6 on Map 200-1 (Mt. Nebo Scientific Survey, Dec. 2004). The site description indicates that the soil is on a slope of 60% and has a 0-4 inch topsoil horizon, with a lithic contact at 34 inches. The soil was placed in the Great Group of Haplustepts and Ustorthents and is described as stony sandy loam (20% stones at the surface).

The 1.4 acres of disturbed soils in the Rominger side canyon are approximately eighteen inches deep over mixed coal/soil (AMR project report #AMR-015-904M). Sample S-8 is shown on Map 200-1(Soils Appendix Vol 11.), and a site description confirms 14 inches of topsoil over coal mixed with soil. The soils contain 20% gravels, 15% cobbles, 5% stones, and 5% coal fragments on the surface. The original soil surface was found buried under the coal at a depth of about 5 ft in AMEC pit 13 (Vol 11. Appendix- Engineering). Disturbed soils of the reclaimed Rominger site were sampled for laboratory analysis in December 2004 (site RC5, Appendix B, Vol. 11) to establish a baseline condition.

Under optimal conditions, salvage from the 3.0 acres would yield approximately 3,400 yd^3 of soil: based upon 4 inch recovery over 1.6 acres and 14 inch recovery over 1.4 acres. This figure is the maximum potential for the site, since the coal mine waste burial site in Rominger Canyon does not have even coverage and since the steeper slopes have a large amount of rock on the surface and in the profile.

Construction Sequence

Step 1.
Bulk density will be analyzed to a depth of 4 ft. on slopes less than 2h:1v, prior to disturbance to provide baseline information on the native and reclaimed surface soils of Rominger Mine Canyon. The bulk density testing will follow an accepted agronomic procedure described in the following reference:

Soil Science Society of America. 1986. Series No. 9. Methods of Soil Analysis: Physical and Mineralogical Methods. Part 1. Second Edition. Arnold Klute, Ed.

Bulk density measurements will be taken again, after re-exposure of the buried soil, to provide an indication of the degree of compaction created by large stockpiles of soil.

Step 2.
Large vegetation will be removed and track equipment will be used to install 2 ft diameter culvert UC10 (Sections R645-301-231.100 and R645-301-231.400 and Vol. 11-Appendix - Hydrology Appendix B Table 8, and Map 700-2) to direct surface flows (originating from the watershed above Rominger Canyon) beneath the storage pile.

Step 3.
Marker fabric fabric will be laid over the entire surface of the storage area.

Step 4.
The subsoil will be placed on top using track equipment.

Experimental Practices -Operational Monitoring

Ongoing monitoring

Section R645-302-218 indicates that the undisturbed bypass culvert inlet and outlet will be regularly monitored and maintained, as required by R645-301-742.312, to be stable and to provide protection against flooding, etc.

Prior to disturbance and Reclamation Monitoring

Bulk density testing of the existing soil surface to a depth of four feet (or lithic contact) prior to and after disturbance will be conducted on slopes less than 2h:1v, to obtain information about the depth of compaction resulting from long term storage of soil. The important aspect of the bulk density testing is that the same procedure is used before and after disturbance. Monitoring will follow an agronomic method, such as listed in Soil Science Society of America. 1986. Series No. 9. Methods of Soil Analysis: Physical and Mineralogical Methods. Part 1. Second Edition. Arnold Klute, Ed., Chapter 13.

Application of PAM to slopes greater than 50% (2h:1v) will be monitored for cover and erosion as described in item 6) Experimental Practice Monitoring, p. 37, Chap 2, Vol. 11 of the MRP. The treated slopes will be compared with monitoring of adjacent undisturbed areas to determine effectiveness of the PAM application in encouraging vegetation establishment and limiting erosion.

Reclamation - Experimental Practices

Slopes steeper than 50% (2h:1v)

At final reclamation, the stored construction fill soil will be removed to the depth marker fabric fabric. Care will be taken not to sub-excavate or disturb the native soil profile. Fill removal will be done by small earth moving equipment. The marker fabric will be removed and the condition of the underlying soil materials observed at this time.

Re-exposed soil of the reclaimed Rominger Mine site (lesser slopes) will be tested for nutrient status and bulk density.

Slopes steeper than 50% will be treated with an anionic polyacrylamide (PAM) during seeding to increase cohesion and infiltration of water without disrupting soil structure. Seed mix will be as described in Table 300-8, Vol 11. Bareroot or containerized plant stock will be pre-

treated with PAM and used as enhancement plantings on the re-exposed, steep slopes. The Division and Permittee assume that 20 years hence, advances will be made concerning the specifics of PAM application, consequently the plan indicates that details of the PAM application will be reviewed prior to implementation.

For current information on the use of PAM:
http://kimberly.ars.usda.gov/pampage.shtml
http://esce.ucr.edu/soilwater/spring_2001.htm
http://www.hydrosource.com/clpbbs02.htm

Slopes less than 50% (2h:1v)

Slopes less than 2h:1v will be sampled for bulk density to a depth of four feet (Section R645-301-242) before and after soil burial. The effect of soil storage on underlying soils will be reported, increasing our understanding of the compaction created by large soil stockpiles.

To relieve soil compaction and increase the ability of the soil to absorb moisture, the re-exposed soils over reclaimed mine waste will be covered with 1 T/ac alfalfa hay mulch which will be worked into the soil with gouging. (Fertilizer will be added pending test results and comparison with baseline information.) Gouging will create a pattern of depressions that help control erosion through water retention, minimize siltation, and allow for air and water penetration into the soil horizon.

Excess boulders will be randomly placed to cover 5% of the surface. The seed mix described in Table 300-8 will be applied. PAM will not be applied to slopes less than 50%.

Analysis of the Proposed Experimental Practice

The soils regulations are intended to protect and preserve topsoil resources for the purpose of revegetation thus providing a stable surface capable of supporting the postmining land use. The proposed experimental practice, including operation and reclamation procedures, provides protection equal to or greater than what would be obtained through traditional methods required in the regulations. The Division has analyzed issues related to the proposed experimental practice, and the applicant has adequately addressed each of these concerns as follows:

1. **Compaction.** Pad fill material will compact the soil, but to what degree and what depth is unknown. Previous in-place experimental practices have assumed that below eighteen inches, there should be few effects of compaction from the fill. The applicant intends to measure the bulk density of the in-place soil before and after subsoil storage to gain some understanding of the depth of compaction with loading. Compaction will be monitored on slopes less than 2h:1v and will be relieved through

gouging of the surface. This procedure, combined with natural processes (e.g., freeze/thaw), should adequately alleviate compaction and allow vegetation to become established. Compaction will be relieved on steep slopes because the entire soil profile of boulders, rocks, cobbles will remain in place and through the use of PAM which is reported to provide for infiltration of water which will encourage root growth.

2. **Decreased microbial activity.** Soil sterility is a problem whether soil is salvaged and stockpiled for years, or buried in place. Previous experimental practices have assumed that natural inoculation from adjacent undisturbed areas occurs over time. The Rominger Canyon Experimental Practice will enhance natural re-colonization by microorganisms with a supernatant from a slurry of soil and water that will be added to the hydroseeder. The soil in the slurry will be taken from adjacent undisturbed topsoil (Vol. 11, Section R645-301-243).

3. **Preserving configuration.** The experimental practice will not only allow preservation of soils in place, it will also preserve the configuration of boulders, cobbles, stones and cementation that provides structure, support and stability of the soils. This structure is difficult to duplicate in reclamation.

4. **Contamination.** Subsoils were sampled and analyzed during the soil survey (to a depth of six feet) and found to be non-toxic. It is unlikely that native soils would be contaminated by the imported subsoils, since subsoils will be placed against the native soils on a 60 ° slope and water will tend to drain downward into the subsoil fill. The in-place reclaimed mine waste at the bottom of the fill is not likely to be contacted by leachate from the subsoil as the depth of fill will average 40 feet and the average rainfall is 16 inches annually.

   Subsoils removed from the experimental practice area at final reclamation will be tested at the time of reclamation to determine whether extremes of pH or salts exist. Extreme values will provide an indication for remedial action of the subsoil (Vol 11, Section R645-301-231.300).

Findings:

The information provided meets the requirements for reclamation of the Experimental Practice. The Division finds that the requirements for approval of the Experimental practice are met and seeks the concurrence of the Office of Surface Mining in accordance with:

R645-302-214.100, the experimental practice encourages advances in coal mining and reclamation technology due to 1) information gained from bulk density testing of the existing surface soils prior to and after storage of the subsoil. 2) enhancement of reclamation technique on steep slopes through the use of anionic polyacrylamide (PAM).

R645-302-214.200, the experimental practice is potentially more, or at least as, environmentally protective, during and after coal mining reclamations, as would otherwise be required, because

1) Additional disturbance in the form of a larger topsoil storage area would be required for salvage and storage of the native soil and soil covering the coal mining waste.
2) The undisturbed surface soils will be covered the with marker fabric to delineate and protect it in place from contamination and erosion.

R645-302-214.300, The coal mining and reclamation operations are not larger than necessary to determine the effectiveness of the experimental practice: storage of subsoil will take place in a single side canyon, previously disturbed by mining (reclaimed by the Division's AML program. The use of the previously disturbed area allows evaluation of the experimental practice of storing subsoils on undisturbed topsoil and against steep, undisturbed slopes, without creating additional disturbed lands.

R645-302-214.400, The experimental practice does not jeopardize the public health and safety. The soil will be placed, stored and removed in a stable manner. The application of PAM will be according to manufacturers directions. Details of application type and rate will be reviewed with the Division at reclamation.