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TO: Daron Haddock, Permit Supervisor

FROM: Priscilla Burton, Senior Soils Reclamation Specialist

RE: Response to Division Order 92A. Convulsion Canyon Mine. Southern Utah Fuel Co. ACT/041/002-DO92A. Sevier Co. Utah. Folder#2.

SUMMARY:

Coastal States Energy was issued a permit renewal on 5/20/92 for the Convulsion Canyon Mine. The renewal included a Division Order to address deficiencies with the SUFCO Plan. Responses received (10/13/92) are discussed below. The deficiency is re-iterated in italics as written in the Order, followed by a summation of information presented and/or compliance with the stated regulation. An itemized list of deficiencies requiring further information is provided in the conclusion section.

A recommendation for bonding adjustment is made, based upon increased substitute topsoil cover depth requirements.

TECHNICAL ANALYSIS:

121.200. Be clear and concise; and

Deficiency #1

SUFCO must modify the text of page 5-15 to reflect the accurate location of the Quitchupah ventilation entry.

Analysis:

A statement is made on page 5-15 that buffer zone markers are located at the Quitchupah vent entry at S1/2 Sec 29 T29S R5E.
The statement on page 5-15 must be in error as the lease area falls within T22S and T21S.

Compliance:
A revision of page 5-15 could not be found with the submittal. Further information is requested.

R645-301-140. Maps and Plans

Deficiency #1

SUFCO must revise or modify Plates 5.1 to provide information on the above ground disturbance prior to 1977; Plates 5.2A and/or 5.2B to indicate areas of contemporaneous reclamation mentioned on page 3-41 and 3-46 of the MRP; and Plate 5.3 to accurately portray the disturbed area boundary

Analysis/Compliance:
Plate 5-2B has been revised to show locations of contemporaneous reclamation and previously disturbed area boundarys.

Plate 5-3 "Post Reclamation Surface Configuration" shows a correct disturbed area boundary at the north end of the disturbed area. The Permittee is in compliance.

222. Soil Survey.

Deficiency #1

SUFCO must revise Plate 2-1 to show the soil sampling locations within and immediately adjacent to the disturbed area; define spoil slopes, rubble slopes, native soils, and rock outcrops; and revise Plate 3-1 to portray the locations of the vegetation and soil sampling sites as described in the text of App 2-2: include all information required on USGS maps, such as contour intervals, roads, trails, streams, Township and Range, etc.

Analysis:
Plates 2-1 and 3-1 have been revised to show the approximate locations of previous soil sampling. Area T on Plate 2-1 does not reflect the Order One survey delineations provided by the EPS study (Map D Pond Area Soils Map, App 2-2). Area X does not delineate areas of intensive sampling conducted by ARS (App 2-3). Unfortunately, App 2-3 does not provide a map showing the extent of each soil type, nor were the soils identified taxonomically.

Shading on Plate 2-1 delineates a fill (spoil) slope which will be used for substitute topsoil (pg 2-9), but a legend for the shading was not provided on Plate 2-1.

Rock outcrops which were included on Plate 5.3 should also be included on Plate 2.1 as per

the standards of the National Cooperative Soil Survey.

Compliance:
Plate 2-1 should be amended as follows: add a legend for the substitute topsoil locations shown on Plate 2-1; and delineate the extent of each of the soil families identified in App 2-2, Map D (as per National Soils Handbook Title 430, Part 605.03(d)(8)(i)(B)[2]; and add known rock outcrops which are shown on Plate 5-3 (as per NSH Title 430, Part 605.03(d)(6)(ii).

Deficiency #2

SUFCO must identify within Chapter 2 of the MRP which supporting documentation from App 2-2 and 2-3 applies to the soil sample locations described on the revised Plate 2-1.

Analysis/compliance:

Approximate soil sample locations and corresponding Appendix location have been provided on Plates 2-1 and 3-1. Testing of the spoil slope south of the sediment trap and soils east of the office complex was conducted by ARS and presented in App 2-3. The Permittee is in compliance.

For areas other than the sediment pond, the information in the appendices has limited value for determination of soil types and depth of horizonation. Consequently determination of soil salvage depths for undisturbed areas within the disturbed area boundary may require a preliminary soil survey of each proposed disturbed area prior to disturbance of the topsoil, to ensure compliance with the topsoil salvage plan described within the MRP.

224. Substitute Topsoil.

Deficiency #1

SUFCO must identify contemporaneously reclaimed areas which will be redisturbed for substitute topsoil on a map and in the plan and distinguish these areas as interim revegetation/substitute topsoil storage.

Analysis:
Plate 2-1 has a shaded spoil slope (approx. 2 acres) which will be a source of substitute topsoil during final reclamation along with the soils of the sediment pond area and other suitable locations (pg 2-9) and from restored slopes (pg 2-14).

Compliance:
The legend on Plate 2-1 should identify the shaded area as a source of substitute topsoil.

The slope east of the office complex has been contemporaneously reclaimed. This should be indicated on the map as contemporaneous reclamation and substitute topsoil material as per pg 2-14 of the the plan.

Deficiency #2

SUFCO must provide within the text of the MRP: a) an evaluation of the soils which are presently within the pad, which have potential for substitute topsoil use and which are the best available material within the fill for cover; b) a commitment in Chapter 2 of the MRP to test all proposed substitute topsoil material at the time of final reclamation according to Table 6 of UDOGM's 1988 "Guidelines for the Management of Overburden and Topsoil," and to include in the testing analysis of sulfate and chloride concentrations prior to utilizing any pad fill for substitute topsoil; c) an outline of the number of tests to be conducted based on the volume or tonnage of substitute topsoil to be utilized during final reclamation.

Analysis/Compliance:
Part a) The Permittee refers to App 2-3, the results of a 1979 ARS study of the slopes south of the sediment trap. Although not mentioned, the 1981 D&M study and the 1986 SHB engineering study which provide further information of the pad materials.

Dr. Southard who conducted the survey commented upon the sodic quality of sample location 3 (Gob). An SAR value of 12 reported for sample 3 is considered poor for coarse textured material and unacceptable for fine textured material. No textures were provided for the soils sampled, but gob or waste rock is usually of a coarse nature. SUFCO should note this situation and plan for sampling during the grading process to ensure that the best available cover material is utilized for cover as per R645-301-233.100. The Permittee is in compliance with Part a.

Part b) The Permittee refers to a sentence on pg 2-15, section 2.3.3.3 which states, "The applicant will utilize the proposed topsoil subsequent to approval by the regulatory authorities." The plan further explains that SCS methodologies will be followed by the analytical laboratory. Section 2.4.3 further describes analysis according to the Division "Guidelines." Page B-9 of App 2-4 indicates that boring sample 5 from the pad may contain materials high in sulfates and is a potential source of acidity. Analysis by the Guidelines for Acid/Base Potential should allow determination of the need for burial or amending of this material. The Permittee is in compliance.

Part c) An outline of the frequency of testing to obtain said approval was not included in the

submittal and can not be adequately bonded for. For the purposes of determining adequate bonding and ensuring compliance with R645-301-224, it is recommended that SUFCO develop a sampling plan for the regraded spoil: to estimate the frequency of sampling per yard, acre or ton of substitute topsoil material during or after final grading. If sampling is conducted after grading, specify planned sampling depth of the substitute topsoil, and whether samples will be composite or segregated by depth.

The exposed south slope of the mine pad is a proposed source of substitute topsoil. Interim reclamation of this area will serve to protect the substitute material and demonstrate the suitability of the material for substitute topsoil. Demonstration test plots have been proposed, see R645-301-341.300.

Deficiency #3

SUFCO must correct the first statement made in Section 2.24 to indicate that substitute topsoil will be selected from pad fill and contemporaneously revegetated slopes, and; correct the last statement of section 2.3.2.7 to indicate that importation of substitute topsoil may be required depending upon revegetation success according to the standards of R645-301-356.

Analysis/Compliance:
Section 2.2.4 and Section 2.3.2.7 have been corrected. The Permittee is in compliance.

230. Operation Plan.

Deficiency #1

SUFCO must indicate in the text of the MRP: a) an average soil depth which will be salvaged from proposed disturbances or indicate that a topsoil survey will be conducted prior to new disturbance (page 4-10); b) that minor disturbances where SUFCO does not not anticipate topsoil removal will meet with prior UDOGM approval (Section 2.3.2.4); c) that salvaged and stored topsoil will not be moved without prior approval from the Division (Section 2.3.4.3); d) that the A, B & C or A & AC & C horizons will be collectively segregated from the proposed disturbed area and stockpiled (Section 2.3.2.5 on page 2-13).

Analysis/Compliance:
Part a) Page 2-10 of the MRP is referred to in the response. This provides an assurance of salvaging topsoil and underlying horizons prior to disturbance. Sections 2.3.1.1, 2.3.2.2, 2.3.2.3, and 2.3.2.5 outline the removal of topsoil and subsoil from new disturbances. For areas with limited A horizon development (Section 2.3.2.3) the depth of soil to be removed and segregated is not specified. Will the operating performance standard for the depth of

salvage be according to Section 2.3.1.1.? In otherwords, salvage and storage of A through C horizons for areas of limited A horizon development? Section 2.3.2.3 and Section 2.3.1.1 must indicate an operating performance standard for the depth of salvage for areas with limited A horizon development.

Part b)
Page 2-13, Section 2.3.2.4 states "Topsoil will not be removed prior to construction resulting in only minor disturbances as described in R645-301-232.400..." Division approval of this wording will allow minor disturbances of all sites as described in R645-301-232.410 and 420. Therefore, Section 2.3.2.4 will become a performance standard as per R645-301-251. The Permittee is in compliance.

Part c)
Sections 2.3.4.2 and 2.3.4.3 state a commitment to seek DOGM approval prior to relocation of topsoil piles during operations. The Permittee is in compliance.

Part d)
Section 2.3.1.1 in combination with Section 2.3.2.5 indicate SUFCO's plan for segregation of topsoil (A horizon) and salvage of subsoils prior to new disturbances. The Permittee is in compliance.

Deficiency #2

SUFCO must indicate in the text of the MRP the volume of topsoil presently stored at the mine facilities and subsoil stored in the substation binwalls intended for final reclamation cover material.

Analysis/Compliance:
Section 2.3.1.4 itemizes the topsoil and subsoil which has been segregated for cover material. The sediment pond pile covers 0.105 acres and contains 1,200 yd^3. The substation pile covers 0.02 acres and contains 27 yd^3. How were the volumes determined?

Subsoil removed from the Run of Mine storage pile location is stored at the Waste Rock Disposal Site. Topsoil was removed from the storage site prior to placing the subsoil pile. There is 1000 yd^3 of material in the topsoil pile designated for use on the adjacent subsoil storage area (pg 2-12, section 2.3.1.4).

2,160 yd^3 of this subsoil was utilized in the construction of the bin walls of the substation. This subsoil along with the 5,300 yd^3 of road base in the binwall will be available for cover

during final reclamation (Section 2.3.1.4). The Permittee is in compliance.

Prior to utilizing substation road base and binwall materials as substitute topsoil, the Permittee should ensure that there has been no contamination by oils, greases, diesel, gas or lubricants.

240. Reclamation Plan.

Deficiency #1

SUFCO must commit to ripping the subsoil to an 18-24 inch depth and applying substitute topsoil cover depths of 12 inches on slopes less than or equal to 2h:1v; and ripping to a depth of 12 inches and applying substitute topsoil cover depths of 8 inches on slopes greater than 2h:1v up to the angle of repose, 1.5h:1v.

Analysis:

Specification of ripping depth was not determined to be required by R645-301-242.200. The term "suitable" was determined to be acceptable for a description of ripping depth in an Administrative review as stated in letter form on 8/6/92 in the correspondence folder of ACT/007/005. SUFCO will scarify slopes with suitable equipment to a suitable depth, pg 2-19, Section 2.4.2.2.

Compliance:
The reclamation plan does not specify details of soil redistribution practices. Although Division Management does not feel that this information is warranted at the present time, I recommend that the Division acquire specific details for the site prior to final reclamation. These details will be required for a determination of compliance with the performance standard of R645-301-251 and for bond release inspections.

A commitment to replace 6 inches of substitute topsoil over compacted fill will not be comparable to predisturbance soil depths. A minimal 12 inch substitute topsoil cover depth on the lesser slopes equal to or less than 2h:1v and and 8 inch depth on the steeper slopes greater than 2h:1v up to the angle of repose, 1.5h:1v, should be required by the Division. Page 2-18, and bonding calculations should be revised accordingly.

Deficiency #2

SUFCO must commit to applying an amendment (such as alfalfa hay at a rate of 3T/ac) and

a complete (N, P, K) fertilizer to the topsoiled slopes prior to scarifying to a depth of 6 inches; as well as gouging with a track hoe all slopes less than 2h:1v after topsoiling and prior to seeding.

Analysis/Compliance:
The intent of this condition was not only to ensure compliance with the erosion protection regulations of R645-301-240, but also to incorporate a source of organic matter which would provide a source of nutrition for decay organisms, beginning the healthy development of soil in material which will have been stored for decades in the sterile environment of the mine pad and bin walls. This practice or any other method of incorporation of organic amendment to the soil (exclusive of seed mulch) is recommended as a suitable practice to promote revegetation success. Field trials can test the best methodology (see R645-301-341.300.

Section 2.4.3 states that soils will be analyzed according to the Division "Guidelines" to determine what amendments and fertilizers will promote revegetation. The Permittee is in compliance.

<u>*Deficiency #3*</u>

SUFCO must provide the Division with cut and fill volumes derived from Plate 5-3 Post Reclamation Surface Configuration and Plate 5-4 Post-Reclamation Cross Sections submitted with the MRP or revise Plates 5-3 and 5-4 to show cross-sections from which reported cut and fill volumes were calculated; and provide within the MRP a supporting discussion of the angle of repose for the spoil slopes to which topsoil will be applied.

Analysis:
SUFCO indicates that App 2-4 and 2-5 supply adequate information for calculation of cut/fill volumes.

Compliance:
Cut and fill volumes reported in App 2-5 and referred to on page 5-55 of the MRP are calculated from maps and cross-sections developed by the SHB engineering study of the mine pad. Total cut is calculated at 42,150 yd^3. Total fill is calculated at 41,100 yd^3 (App D of App 2-4, pg 12 of 12).

Plates 5-3 and 5-4 do not provide the reclamation cross-sections from which the above cut and fill volumes were calculated. The MRP (pg 5-55 of Section 5.4.2.2) quotes total cut and fill volumes of 74,734 yd^3 and 71,173 yd^3, respectively. The calculations are not provided for review and the cross-sections used to derive these cut/fill volumes are not identified. The reader is referred to App 2-4 where the lesser cut/fill volumes are derived.

The Division can not check the adequacy of the calculations of cut/fill volumes with the information provided in the MRP. Please provide cross-sections and calculations to the Division which were used to develop the cut/fill volumes in Section 5.4.2.2.

The commitments for replacing topsoil on slopes less than 1h:1.5v appears to have been derived from the EPS study in App 2-2, pg 35a. (This may be a typographical error which should read 1.5h:1v.) The Division requires that topsoil is replaced on all slopes of 2h:1v or less. SUFCO's commitment to replace topsoil on steeper slopes will require evidence that this angle is less than the angle of repose for an uncompacted surface (R645-301-553.130). Please indicate the angle of repose for the spoil slopes and make the appropriate corrections in page 2-18 of the MRP.

R645-301-341.300 Revegetation Feasibility Demonstration

Deficiency #1

SUFCO must provide a schedule for establishing revegetation test plots to demonstrate the suitability of substitute topsoil and final revegetation techniques at the mine site.

Analysis/Compliance:

SUFCO has stated in the submittal cover letter that a demonstration plot program will be developed with input from the Division. SUFCO anticipates development of these plots in the Fall of 1993. The Permittee is in compliance. The Permittee should submit an amendment for review by the soils and biologists on staff. An objective of the trials should be to determine the benefits of organic matter amendments to the soils (see discussion under R645-301-240, Deficiency #2).

553.620. Approval is obtained from the Division for incomplete elimination of highwalls in previously mined areas in accordance with R645-301-553.500;

Deficiency #1

SUFCO must provide a surface map with the highwall retention request of Appendix 5-2 to outline surface disturbance previous to the 1977 SMCRA regulations prior to receiving Division approval of this practice.

Analysis:

A request for incomplete elimination of highwalls is presented in Appendix 5-2. Slopes are identified along the west and north of the disturbed area and shown on App 5-2 Plate 1 "Highwall Cliff/Ledge Retention Map." A map showing pre-SMCRA surface disturbance was requested.

SUFCO indicates that Plate 5.1 has been revised to show pre-SMCRA disturbances. A revision of Plate 5.1 could not be found with the submittal. However, a revision of Plate 5.2B was found with the submittal which shows limited pre-SMCRA surface facility development with one legend and a second legend with much larger surface disturbance prior to 1977. Please clarify this discrepency.

CONCLUSIONS:

As discussed in the body of this document, further information is recommended for a determination of compliance with the following deficiencies of Division Order 92A:

R645-301-121.200,	Deficiency #1
R645-301-222,	Deficiency #1
R645-301-224,	Deficiency #1, Deficiency #2 Part c
R645-301-230,	Deficiency #1 Part a
R645-301-240,	Deficiency #1, Deficiency #3
R645-301-553.620,	Deficiency #1

The reclamation plan does not specify details of soil redistribution practices. Although Division Management does not feel that this information is warranted at the present time, I recommend that the Division acquire specific details for the site prior to final reclamation. These details will be necessary for a determination of compliance with the performance standard of R645-301-251 and for bond release inspections.

I recommend that bonding is revised to require a minimal 12 inch substitute topsoil cover depth on slopes equal to or less than 2h:1v and and 8 inch depth on the steeper slopes greater than 2h:1v.