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 DIVISION OF OIL, GAS AND MINING

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TO: Internal File

THUR: Dave Darby, Team Lead/ Reclamation Hydrologist 

FROM:  Priscilla Burton, Soils Reclamation Specialist, III

RE: Link Canyon, Canyon Fuel Company, LLC., SUFCO Mine, C/041/002-AM02E-1

SUMMARY:

The Link Canyon submittal was received on April 8, 2002. The Division's initial Technical Analysis was dated July 17, 2002. The Permittee's response to the deficiencies was received on August 12, 2002.

The proposal is to develop an access road and portal pad in Link Canyon for the purpose of an air intake and emergency escape-way. The disturbed area boundary would encompass 0.23 acres, although the actual disturbance is planned for only 0.14 acres, of which 0.05 acres are riparian in nature due to mine water discharge from the pre-SMCRA portals. The site is previously disturbed, but the locations of pre-SMCRA disturbance have not been outlined on a map.

The application describes topsoil salvage from zero to six inches depth. Approximately 80 cu yds of topsoil is to be salvaged from the site. The location designated for storage is in contention with the Forest Service and Division.

The Permittee has made special provisions for rapid establishment of vegetation on the topsoil pile, by utilizing the existing vegetation (*Mahonia repens*) as transplants. The topsoil analysis shows soil that is uniquely fertile for the area.

This memo covers only previously identified deficiencies. Further information on environmental resources can be found in the previous review of AM02E.

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TECHNICAL ANALYSIS:

GENERAL CONTENTS

REPORTING OF TECHNICAL DATA

Regulatory Reference: 30 CFR 777.13; R645-301-130.

Analysis:

An Order I Soil Survey was conducted of the proposed Link Canyon pad and portal area in December 2001 by Dan Larsen, Soil Scientist, Environmental Industrial Services, Inc., Helper, Utah. Mr. Larsen's credentials along with those of Mr. Keith Zobell and Dr. Patrick Collins are found in Appendix 2-9.

InterMountain Laboratories, Inc. of Sheridan, Wyoming analyzed the soil samples.

Findings:

Information provided in the application meets the minimum Technical Data Reporting requirements of the Regulations.

MAPS AND PLANS

Regulatory Reference: 30 CFR 777.14; R645-301-140.

Analysis:

The application makes reference to previously disturbed areas in Section 2.3.1, page 2-11 and in Section 3.2.2.2, page 3-22. The Permittee indicates that these areas are shown on Plate 5-2F. The workings are shown on Plate 5-2F, but the previously disturbed area is not outlined on this plate.

Findings:

The information provided does not meet the minimum Maps and Plans requirement of the Regulations. Prior to approval, the Permittee must provide the following in accordance with:

R645-301-142, The application must include a map that distinguishes between disturbances which occurred prior to August 3, 1977, which are therefore pre-SMCRA disturbances.

ENVIRONMENTAL RESOURCE INFORMATION

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

Soil Identification and Description and Productivity

The soils of the site were identified to their subgroup as either Typic or Calcic Ustocrepts, ranging from coarse silty to loamy-skeletal and are calcareous to carbonatic. The soil taxonomic classification was modified by Mr. Larsen in a letter dated July 15, 2002. According to the letter, the soils at the site are classified as

Order: Inceptisols (young, little horizonation; little pedogenesis)
Suborder: Ustepts (inceptisols that have a ustic soil moisture regime).
Great Group: Haplustepts (other Ustepts)
Subgroup: Typic or Calcic
Family: coarse silty to loamy-skeletal, mixed, frigid
Phases: calcareous to carbonatic

The soils were mapped using the following designations:

WC Waste Coal
DR Disturbed
CU Calcic Ustochrepts, now classified as Calcic Haplustepts
TUE Typic Ustochrepts, eroded carbonic, now classified as Typic Haplustepts
TUL Typic Ustochrepts, light surface, now classified as Typic Haplustepts
VS very stony bouldery areas
RP riparian sites

The field sheets in Appendix A and the soils maps of Appendix E, describe soils supporting pinyon pine, juniper, rabbitbrush, ephedra, serviceberry, sagebrush and bunchgrass. (During a site visit on December 6, 2001, the Division noted extensive colonies of *Mahonia repens*, Creeping Mahonia).

Soil Characterization

The soil horizons were sampled and analyzed according to DOGM guidelines for topsoil and overburden. Soil texture, rock fragment content (percent by volume), and Munsell color were determined in the field. Available Water Holding Capacity was estimated based upon

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texture and verified by saturation percent. Percent surface boulders and stones were noted on the field sheets as between 20 and 85%.

The Soil Description Location map in Appendix 2-9 shows seven sample locations.

Soil samples were sent to InterMountain Laboratories, Inc. Sheridan, Wyoming, for analysis. Appendix B of Appendix 2-9 contains the laboratory data. Appendix C provides a comparison of the soil test results with the Division's soil suitability criteria.

Overall, soil laboratory test results show a good rating for soil chemistry and fair rating for soil water holding capacity after correction for coarse fragments except as noted below:

Site #2, along the access road, 12 -24" depth, Electrical Conductivity (EC) equal 18.1 and Sodium Adsorption Ration (SAR) equal 9.18 and 0.26ppm Selenium
Site #5, along the access road, 0 - 25" depth, EC equal 8.37 and carbonates equal 45%.

Although concretions of carbonate were noted at site #5, there was no calcic horizon formed. As would be expected in a zone of carbonate precipitation, soluble magnesium is more abundant than soluble calcium at this depth. Roots were noted to a depth of 25 inches. Division photos of the site taken on June 5,2002 show a plant community that does not appear to be affected by the elevated EC or the carbonate content of the soil.

These soils are developing on weathered coal and presently have an "A" horizon that is between 4-6 inches in depth and a B or C horizon extending to 20 to 40 inches. The surface soils ("A" and "B" horizons represented by sample sites 1, 2 and 5 are very fertile with Nitrate Nitrogen between 8.54 and 50.8 ppm, Phosphorus ppm between 0.92 and 3.45, and Potassium between 62.3 and 224 ppm. (The weathered coal is likewise rich in nitrate nitrogen.) This provides an interesting baseline for fertilization during reclamation of the site.

Sample site #6 represents the TUL map unit. This location had shallow topsoil 0-6 inches deep overlying a shallow (to 13 inches) C horizon. The soil was described as very stony and bouldery with 60% of the surface being rock.

A small riparian area (0.05 acres) represented by site #7 has very stony sandy loam soils to a depth of six inches deep. The riparian soils will be salvaged.

In accordance with R645-301-232.200, 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. Depths of salvage range from 6 to 18 inches over the site (see Available Soil Resources table in Section 232.100). 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 does meet the minimum Environmental Soil Resource requirement of the Regulations.

OPERATION PLAN

TOPSOIL AND SUBSOIL

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

Analysis:

Removal and Storage

Regulation 645-301-232.100 requires topsoil removal from all disturbed areas. The disturbed area boundary encompasses 0.23 acres. The boundary has been drawn wider than the expected area of disturbance. Topsoil will be removed along the portal access road and at the portal pad, approximately 0.14 acres of new disturbance, but not from beneath the proposed power distribution structures. Therefore, there will be 0.09 acres of undisturbed ground within the disturbed area. Should the area of disturbance expand to the disturbed area boundary and encompass the additional 0.09 acres, topsoil must be removed from those 0.09 acres prior to disturbance.

Soils will be removed from all disturbed areas with the exception of the power pole disturbance and from undisturbed islands within the disturbed area. The area of topsoil removal will be flagged, according to the cover letter attached with this submittal (dated August 6, 2002).

The Permittee will have a qualified person on site during construction and reclamation phases (Section 2.3.1.1, page 2-13). Soil types and estimations of salvage depth and area are related in a table in Section 2.3.1.1, page 2-13. In this table, the area of salvage sums to 0.1 acre and the recovery depth of six inches will be used on the riparian areas (RP), the Calcic Haplustepts (CU), and the Typic Haplustepts, light colored (TUL). Less soil recovery is expected in the Typic Haplustepts eroded, carbonatic (TUE) soils. The Permittee has noted on page 2-20 Section 2.3.2.3 of the MRP that all soil will be salvaged to a depth of six inches where the topsoil is less than six inches in depth.

Soil handling will be done at a moisture level of at least 15% (page 2-14, Section 2.3.1.1). A tracked vehicle will be used for topsoil removal (page 2-13, Section 2.3.1.1). A rubber tired vehicle may be used after the topsoil is salvaged.

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The plan indicates in Section 2.3.1.1 page 2-11 that topsoil will be carefully separated from the subsoil since most of the subsoils are not suitable as substitute topsoil or growth media, due to high carbonates in the subsoils.

Approximately 80 yards of topsoil will be stockpiled. Page 2-13 Section 2.3.1.1 indicates that the actual volume of soil salvaged and dimensions of the stockpile will be shown on an as-built map.

Berms (and/or silt fences) and a three-strand barbed wire fence will be used to protect stored topsoil (Section 2.3.1.4, page 2-18). The stockpile will be vegetated (Section 2.3.4.2, page 2-23), with the forbs and grasses outlined in the seed mix described on page 3-47 (Section 3.4.1.2), revised with this submittal.

The surface of the stockpile will be pitted to retain moisture and reduce erosion (Section 2.3.1.4, page 2-19). In addition the pile will be mulched with grubbed vegetation. This practice is described in the Practical Guide to Reclamation (DOGM, 2000), available at <http://dogm.nr.state.ut.us>.

An attempt to reestablish colonies of *Mahonia repens* (Creeping Oregon Grape) will be made by scooping the surface layer of soil from the TUE soils and temporarily storing the soils until topsoil pile construction is complete. The TUE soils and *Mahonia* roots will then be placed on top of the topsoil pile (Section 2.3.1.1, page 2-14). Care in transplanting these plants will help provide immediate protection and erosion control on the topsoil pile. The surface layer of soil carried with the transplanting operation is valuable for it contains seeds, microorganisms, organic matter, elevated levels of nitrogen and phosphorus.

The topsoil stockpile location is shown on Plate 5-2F. This location is in the existing drainage and may be subject to flooding should a culvert become plugged or some other unexpected event occur. The Division has recommended a change in location of the topsoil in the July 17, 2002 Technical Analysis. Presently, the Forest Service has also requested that the topsoil be relocated outside of the flood plain. Placement of the topsoil in the existing topsoil pile inside the substation fence appears to be difficult. This issue remains to be resolved.

Findings:

R645-301-234.220, The Permittee should evaluate an alternate location for storage of the topsoil pile, out of the drainage on a level slope.

HYDROLOGIC INFORMATION

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817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -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:

Sediment control measures

The slope adjacent to the Link Canyon Portal access road will be disturbed and excavated to create the roadway. Plate 5-2F indicates that a cut approximately six feet deep and 15 feet high will be made on the slope. Page 7-62 of the application indicates that the cut and fill slopes will be revegetated with the the forbs and grasses outlined in the seed mix described on page 3-47 (Section 3.4.1.2), revised with this submittal.

Findings:

Information provided in the application meets the requirements to control erosion as required by the Regulations.

SIGNS AND MARKERS

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

Analysis:

The plan indicates that the disturbed area is 0.23 acres, but that the alternate sediment control area and the actual area to be disturbed and reclaimed is only 0.14 acres (page 1-37). The requirement for placement of signs and markers is to delineate the perimeter of all affected areas. The plan describes placement of signs to delineate the affected area boundary in Section 5.2.1.2 page 5-16. Plate 5-2F indicates marker placement along the disturbed area boundary (0.23 acres).

Finding:

The information provided meets the Signs and Markers requirements of the Regulations.

STABILIZATION OF SURFACE AREAS

Regulatory Reference: 30 CFR Sec. 817.95; R645-301-244.

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Analysis:

The final surface will be pitted (Section 2.4.2.1). All areas will be mulched (Section 2.4.4.1).

Placement of large rocks and boulders and slash is described on page 2-28.

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 (Section 2.4.4.3).

Findings:

The information in the 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:

The Permittee should provide the Division with a map outlining areas of pre-SMCRA disturbance. A discussion between the Permittee, DOGM and Forest Service should resolve the topsoil pile location issue.