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DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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TO: File

THRU: Joe Helfrich, Permit Supervisor

FROM: Robert Davidson, Soils Reclamation Specialist *RAD*

RE: Soils Technical Analysis of the Waste Rock Site Expansion Amendment, Canyon Fuel Company, LLC, Skyline Mine, ACT/007/005-98F, Folder #2, Carbon County, Utah

SUMMARY:

Canyon Fuel, LLC, has submitted an amendment for expanding their current waste rock site by 1.39 acres. The expanded waste site contains approximately 2,198 yd³ of soil that will be salvaged for reclamation. Several deficiencies are summarized as follows:

- The soil survey does not follow the current standards of the National Cooperative Soil Survey.
- Soils were not sampled or characterized according to the Division's Guidelines for Topsoil and Overburden.
- Substitute topsoil was not characterized according to the Division guidelines.
- The amendment does not address where the temporary topsoil stockpile will be located, nor does it specify the size and dimensions of the stockpile.
- There are inconsistencies in affected acreage and soil volumes as stated in submittal.

TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

SOILS RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 783.21, 817.200(c); R645-301-220, -301-411.

Analysis:

The amendment discusses the soil resources within the proposed GOP pile expansion area with an attachment to the appendix volume A-2 for the soils and vegetation section. Relevant soils resource information includes North Facing Slope and AML soils. Published soil survey descriptions and current soil descriptions for topsoil and substitute topsoil are included in the amendment. The Analysis section discusses resource information as follows:

- Soil Survey Information
- Soil Characterization
- Substitute Topsoil

Soil Survey Information

Soil survey information is presented from three separate sources as follows:

(1) *Natural Resource Conservation Service General, Third Order Soil Survey.* A section of the regional soils map and relevant portions of the Carbon County soil survey are reproduced from the Carbon County Soil Survey, published by the United States Department of Agriculture, Soil Conservation Service, National Cooperative Soil Survey, issued in June 1988.

(2) *Past Site Specific Soil investigation.* Soil survey as contained in the presently approved Mine Reclamation Plan, Appendix A-2, Soils and Vegetation, "Report of Vegetation and Soils, Proposed Waste Rock Disposal Site, Skyline Mine, November 1981." This soil survey was prepared by Dr. Stanely L. Welsh and Dr. Joseph b. Murdock of Endangered Plants Studies, Inc. with aid from the Soil Conservation Service, Carbon County.

(3) *Current Site Specific Soil Investigation.* A site specific soil investigation was performed for soils within the planned expansion area on August 26, 1998 and prepared by Mr. Chris Hansen, Canyon Fuel, LLC Skyline Mine. Three soil pits were hand dug into the slopes of the expansion area and soil horizons were described (Plate 3.2.8-2).

The current site specific soil investigation covers approximately 0.7 acres of the total 1.39 acres expansion area and includes three separate areas as follows:

- 0.14 acre area - included in the site specific soil investigation is the undisturbed vegetated slope east of the existing pile (pits GPE-1 and GPE-2, Plate 3.2.8-2).
- 0.23 acre area - the expansion area will include a portion of an AML reclaimed slope which is north of the existing gob pile (GPE-3, Plate 3.2.8-2).
- 0.31 acre area - reclaimed slope of the existing gob pile where soil cover is already placed.
- 0.71 acres where no soil investigation was performed - active road right-of-way which is located northwest of the gob pile where soil resources are limited or non-existent.

North Facing Slope

Soil Log field data sheets contain soil descriptions for pits GPE-1 and GPE-2 for the north facing slope east of the existing gob pile. Soil descriptions suggest that these soils resemble the Midfork Family soils; however, the soils are much thinner than those described by the Carbon County Soil Survey. Evidence of a Mollic epipedon is weak based on color, thickness and structure.

The soils logs show an A1 horizon underlain by a C1 horizon. Current standards for the National Cooperative Soil Survey no longer uses the "A1" designation as used in this context. Descriptions for the C1 horizons for both GPE-1 and GPE-2 indicate these horizons may actually be a second A horizon and part of a Mollic epipedon, particularly for GPE-2. Since these soils appear to have been disturbed in the past, mixing and thinning of the surface soils will have partially obscured the Mollic epipedon. For GPE-1, the "Gravelly cobbly loam" term is neither accurate or correct according to the standards of the Soil Survey Manual. According to the rock description contained in the log, the proper adjective and textural class should read "very gravelly loam." No indication is given for size of pebbles in either GPE-1 or GPE-2.

AML Soils

The soils log shows that these soils are imported fill used for reclamation. Therefore, these soils are classified as substitute topsoil. These soils are silty loam with no developed structure and a rock content less than 10 % that consists mainly of pebbles. Vegetation is occasional sage dominated by grasses, including cheat-grass.

Soil Characterization

The soil horizons at each sampling location were not sampled or characterized according to the State of Utah Division of Oil, Gas and Mining (DOG M) guidelines for topsoil and

overburden¹.

Substitute Topsoil

Substitute topsoil from GPE-3 was not sampled or characterized according to the Divisions's guidelines for topsoil and overburden.

Findings:

The permittee must provide the following, prior to approval, in accordance with the requirements of:

R645-301-222 and R645-301-223, The soil survey does not follow the current standards of the National Cooperative Soil Survey. Soils were not sampled or characterized according to the Division's Guidelines for Topsoil and Overburden.

R645-301-224, Substitute topsoil was not characterized according to the Division guidelines.

OPERATION PLAN

TOPSOIL AND SUBSOIL

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

Analysis:

The amendment discusses the proposed GOP pile expansion area with an attachment to the appendix volume A-2 for the soils and vegetation section. Relevant soils resource information is used for projecting soil salvage volumes. The Analysis section discusses resource information as follows:

- Topsoil and Subsoil Removal
- Topsoil Storage

¹Leatherwood, J., and Duce, D., 1988. Guidelines for Management of Topsoil and Overburden for Underground and Surface Coal Mining. State of Utah Department of Natural Resources, Division of Oil, Gas and Mining.

Topsoil and Subsoil Removal

The amendment states that the expanded waste site contains approximately 2,198 yd³ of topsoil and substitute topsoil which will be salvaged for later reclamation. According to the four areas identified in the soil resource section, soil salvage volumes by area are shown as follows for the 1.39 acre expansion area:

- 0.14 acre area - vegetated slope east of the existing pile (345 yd³).
- 0.23 acre area - AML reclaimed slope north of the existing gob pile (1,099 yd³).
- 0.31 acre area - reclaimed slope of the existing gob pile (753 yd³).
- 0.71 acres active road right-of-way - no soil salvage (0 yd³).

Although DOGM's topsoil guidelines suitability criteria considers >30% (by volume) rock fragments (for both gravels <3" in size and cobbles 3 to 10" in size) to be unacceptable, and >10% stones and boulders >10" in size to also be unacceptable, the recent standard preference by DOGM is to salvage "native soils" with "intrinsic rock content". Ultimate site reclaimability using these rocky soils could enhance reclamation success by providing an environment similar to native conditions. Higher rock content soils provide for a more stable reclaimed surface, aid in water harvesting and ultimate water holding capacity of interstitial soils, and create wildlife habitat and niches on the surface where surface boulders and larger cobble sized rocks are placed.

There are inconsistencies in affected acreage as stated in submittal. These inconsistencies relate to the original 6.29 acre site being increased to 7.68 acres as identified in the amendment and topsoil redistribution affected acreage of 5.04 acres. Confusion exists because of inconsistencies as follows:

- Page 1-24 - 1.39 acreage increase (6.29 acres to 7.68 acres).
- Table 2.12.2-1 - 1.39 acreage increase (6.29 acres to 7.68 acres).
- Page 3-18a - 7.68 acres cited.
- Page 3-83 - 1.67 (?) acres redlined and changed to 7.68 acres. Access road acreage shown as 3.30 acres versus 3.55 acres as referenced in on page 1-24.
- Page 4-10, Table 4.2-1 - 6.29 acres changed to 5.04 acres; however, contemporaneous reclamation is shown as 2.64 acres. Therefore, 5.04 plus 2.64 add to 7.68 acres.
- Page 4-38a - 6.29 acres changed to 5.04 acres instead of 7.68 acres. No reference

is given to the 2.64 reclaimed acres and therefore adds to confusion concerning the increased 1.39 acres of disturbance.

- Page 4-38c, Table 4.6-4 - 6.29 acres changed to 5.04 acres instead of 7.68 acres. What does "Private" mean as referenced to the 2,198 yd³ of soil.
- Page 4-38d, Table 4.6-4 - 58.16 acres decreased to 56.91 acres? 119,232 yd³ decreased to 111,283 yd³? The footnote 77,464 plus 41,768 equal 119,232 yd³.
- Page 4-58, Table 4.7-7 - 6.29 acres changed to 7.68 acres.

Topsoil Storage

The amendment does not address where the temporary topsoil stockpile will be located, nor does it specify the size and dimensions of the stockpile.

Findings:

The permittee must provide the following, prior to approval, in accordance with the requirements of:

R645-301-120, There are inconsistencies in affected acreage and soil volumes as stated in submittal.

R645-301-234, The amendment does not address where the temporary topsoil stockpile will be located, nor does it specify the size and dimensions of the stockpile.