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December 17, 1997

TO: File

THRU: Joe Helfrich, Permit Supervisor

FROM: Robert Davidson, Soils Reclamation Specialist RAD

RE: Cottonwood Fan Portal, PacifiCorp, Cottonwood Wilburg Mine, ACT\015\019-97C, Folder #2, Emery County, Utah

SUMMARY:

The Cottonwood Fan Portal area was initially disturbed in the early 1980s. It was the intention of the permittee to construct a fan portal and a facility pad. However, the fan portal project was never completed beyond the surface disturbance for constructing the pad area. The salvaged topsoil, subsoil, and fill material remained where they had been stockpiled and the cuts for the planned facilities remained. Nevertheless, no facilities were built and nothing further was done with the area.

The reclamation plan for the Cottonwood Fan Portal was reviewed as part of the mid-term in early 1997. The Operator responded to that review with an MRP amendment dated July 1, 1997. The soils Technical Analysis, dated August 8, 1997, reviewed the July 1 submittal and found several deficiencies within the plan. Lack of continuity of information, both in text and mapping was found. The plan has again been resubmitted on October 1, 1997 with assembled information having been assimilated from the original MRP. This Technical Analysis reviews this latest 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 MRP amendment contains adequate information for the following:

- Soil Survey
- Soil Characterization

Soil Survey

Soil Surveys presented in the "Proposed Cottonwood Fan Portal Area, Cottonwood Canyon" submittal include the following:

- 1979 Cottonwood Fan Portal Soil Survey
- 1993 Cottonwood/Trail Mountain Portal Area Order I Soil Survey

Both of these soil surveys are presented for representation of the soils that were affected during the initial surface disturbance of the Cottonwood Fan Portal hillside.

1979 Cottonwood Fan Portal Soil Survey. The original 1079 Soil Survey (MRP pages 2-154 thru 2-158) contains soil information for the immediate area of the Cottonwood Fan Portal. Soils in this area are represented by AbG map symbol and includes both Bb, Very Stony Sandy Loam, and Aa, Very Stony Sandy Loam, both on 70 to 80 degree slopes. These mapping symbols are outside the Carbon-Emry Area, Utah, Soil Conservation Service 1970 Soil Survey. Both Aa and Bb soil Typifying Pedons are located near the Old Johnson Mine Portal entry on the upper road, Section 25, T17S, R6E. According to the soils map, map symbol AbG, these pedons represent the entire slope of the proposed Cottonwood Fan Portal. Only the A1 and A11 horizons, 0 to 4 inches, are described in detail by the soil survey. Soils are moderately alkaline (pH 8.0) and strongly calcareous weak platy and granular structures. General typical profile descriptions are given for both soils. The Aa soil extends down to 5 feet; the Bb soil is 20 inches deep over sandstone bedrock.

1993 Cottonwood/Trail Mountain Portal Area Order I Soil Survey. To supply additional adequate soil survey information, PacifiCorp substituted the Order-I survey that was completed in 1993 for the Cottonwood tube-conveyor system. The Order-I soil survey provides

an on-site investigation and soil map for the land that lies just north and adjacent of the proposed fan portal. This soil survey represents soils of similar depth and quality. Comparing soil maps and soil descriptions from both the original 1979 and the 1993 surveys, soils within the fan portal area are most likely similar to the "Map Unit A, Lithic Ustorthents" as described in the Order-I survey.

Soil Characterization

Soil characterization is provided by several series of soil samples, as described in this submittal, Section 220, page 2 through page 3, and include:

- 1997 Soil Samples Cottonwood Fan Portal Area
- 1995 Soil Samples Tube Conveyor Disturbance
- Order-I, 1993 Soil Survey Soil Samples
- Biology Section, page 34, Soil Samples

1997 Soil Samples Cottonwood Fan Portal Area. During June 1997, soil samples were taken of the topsoil, subsoil, reclaimed slope, base of the Hiawatha coal seam, and the seams comprising various bench levels. Results of these samples are contained in the 97C submittal on pages 17 through 23. Sample locations are presented on Plate 5-5, Drawing KS1710D. As represented by the laboratory results, sample materials meet the criteria of the Division's guidelines for topsoil and overburden[1] and present no toxic or acid forming characteristics.

1995 Soil Samples Tube Conveyor Disturbance. Soil samples were taken in 1995 of soils removed from the immediate area where the tube conveyor was to be placed. These soils were removed and stored separately at the old waste rock site, Figure 5 of this 97C submittal. Piles A and C are native soils to be used during reclamation of the overland conveyor while Pile B is Cottonwood Fan Portal subsoil. Soil samples were taken from these piles and results are shown on pages 14 thru 16 of this 97C submittal.

Order-I, 1993 Soil Survey Soil Samples. The Order-I soil survey, prepared by Mt. Nebo Scientific, included six soil samples collected from three soil profiles during the field study. Results are contained in Appendix C of the survey report. These soils represent slopes that are north and adjacent to the Cottonwood Fan Portal area. Results indicate the soils are moderately alkaline (pH 7.9 to 8.2), have low salinity, except for depths below 30 inches in the Pathead soil, have low sodicity with SAR values below 6.7, have acceptable saturation percent values, have gravelly sandy loam textures over sandstone and silty clay textures over shale, and have moderate to high calcium carbonate contents.

Biology Section, page 34, Soil Samples. During 1981, soil samples were collected

[1] Leatherwood, 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.

and results are referenced in the Biology Section, page 34. Samples were taken of the Cottonwood Fan Portal topsoil and subsoil piles prior to seeding of the piles and the steep slope at the base of the proposed fan portal. Data are not presented in this 97C submittal since sample locations and explanation how the samples were taken could not be found in the original MRP.

Findings:

The information provided meets the regulatory requirements of this section.

OPERATION PLAN

TOPSOIL AND SUBSOIL

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

Analysis:

The amended MRP submittal contains adequate information as follows:

- Soil Salvage
- Topsoil and Subsoil Stockpiles

Soil Salvage

The 97C amendment states that topsoil and subsoil were salvaged from the Cottonwood fan-portal area and stockpiled during 1980. After salvage of the topsoil and subsoil, the remaining native material was stripped to hard rock base and pushed towards the county road. When construction procedures in 1981 were completed, the subsoil pile, topsoil pile, and the slope below the fan portal area received interim reclamation and were subsequently revegetated .

Topsoil and Subsoil Stockpiles

Plate 5-5, Drawing KS1710D, delineates the total disturbed area of the proposed fan portal area which includes the slope embankment below the site and the topsoil and subsoil stockpiles. Both the topsoil and subsoil piles are shown and are depicted by baseline x-section stations. Plate 5-4 uses these cross sections to determine the quantities of subsoil and topsoil in the stockpiles. The salvaged topsoil pile contains approximately 1,061 cubic yards while the subsoil pile contains approximately 8,733 cubic yards of soil.

In addition, a portion of subsoil from the Cottonwood Fan Portal subsoil stockpile was relocated, transported and stockpiled at the old waste rock site (see Figure 5, Pile B at the end of the 97C submittal). The subsoil was removed prior to installation of the Cottonwood-Trail

Mountain overland tube conveyor. Approximately 200 cubic yards of subsoil is stored in Pile B.

A Mass Diagram Table is provided on Plate 5-5, Drawing KS1710D which depicts the actual disturbance area for the Cottonwood Fan Portal.

Findings:

The information provided meets the regulatory requirements of this section.

RECLAMATION PLAN

TOPSOIL AND SUBSOIL

Regulatory Reference: 30 CFR Sec. 817.22; R645-301-240.

Analysis:

The MRP 97C amendment contains adequate information concerning soil redistribution as follows:

- Soil Redistribution
- Soil Stabilization and Erosion Control
- Slope Beneath Fan Portal Area
- Remaining Subsoil Topsoil Piles

Soil Redistribution

Plate 5-5, Drawing KS1710D, shows and depicts where topsoil and subsoil will be used in the reclamation of the terraces of the Cottonwood Fan Portal and the Old Johnson Mine Site road. Quantities for soil distribution on each terrace are provide in Mass Balance tables. Plate 5-3 shows the Cottonwood Fan Portal reclamation slope cross sections. A total of 1030 cubic yards of topsoil and 1550 cubic yards of subsoil will be used to reclaim the terraces. The plan does not state the volume of subsoil expected to reclaim the Old Johnson road.

Soil Stabilization and Erosion Control

Soil will be compacted in lifts while rock and boulders will be positioned along the front face of the benches to help control slope sloughing. Mid-sized rocks and boulders will be placed on the prepared slopes and nested into the soil. Rock distribution and placement from the stockpiles and existing slope will be positioned to help provide slope containment and natural esthetic appearance.

Slopes will be between 1½:1 to 2:1. A minimum 1.0 foot topsoil placement will occur on the bench area beyond the fill slope. Six inches of topsoil will be place on the 1½:1 slopes. Subsoil placement is shown on Plate 5-3. Subsoil is used to backfill against the cut slopes and highball with subsoil placement depth varying depending on location.

An erosion control blanket will be used to cover all slopes and benches that receive redistributed soils. Silt fence will be place at the base of the main slope area, above the embankment terrace and reclaimed lower slope.

Slope Beneath Fan Portal Area

The slope at the base of the fan portal area has been reclaimed and revegetated. This slope will not be disturbed during the reclamation of the Cottonwood Fan Portal terraces and will therefore remain as final reclamation.

Remaining Subsoil Topsoil Piles

If all soil materials are removed from the stockpiles, then the pile locations will be regraded to approximate original contour. It is projected that soil will remain in the subsoil pile at the conclusion of reclaiming the Cottonwood Fan Portal and Old Johnson Road areas. The disturbed portion of the pile will be contoured and revegetated. The remaining subsoil will be used to reclaim Trail Mountain if needed. If soil is not needed, the pile will be left as final reclamation.

Findings:

The information provided meets the regulatory requirements of this section.