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March 17, 1998

TO: File

THRU: Joe Helfrich, Permit Supervisor *JH*

FROM: Robert Davidson, Soils Reclamation Specialist *RAD*

RE: Barn Canyon Ventilation Facility, Permit Amendment, Cyprus Plateau Mining Corporation, Willow Creek Mine, ACT/007/038-98B, Folder #2, Carbon County, Utah

**SYNOPSIS:**

Cyprus Plateau Mining Corporation (CPMC) has submitted an amendment for the Barn Canyon Ventilation Facility. The ventilation facility will consist of a ventilation shaft with provisions made to install a ventilation fan at a latter date if conditions develop that necessitate the use of a ventilation a fan.

**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 Barn Canyon Ventilation Facility amendment contains adequate information regarding the soils environmental resources as follows:

- Order-I Soil Survey and Map
- Soils Identification, Description and Characterization

**Order-I Soil Survey and Map**

An Order-I soil survey supplies information for the ventilation facility area. Mr. Jim Nyenhuis, ARCPACS Certified Professional Soil Scientist, conducted the survey for Mt. Nebo Scientific on January 14, 1998. Mr. Robert Davidson, Soils Senior Reclamation Specialist, Utah Division Oil, Gas and Mining (DOG M), was also present on the site during fieldwork. Four soil pits were dug, described,

and sampled for the survey. Two native, undisturbed soils (BC3 and BC4), and two disturbed sites (BC1 and BC2) were sampled. For site BC2, the surface had been disturbed with the underlying soil substratum (C horizon) still present. Standard soil descriptions were completed in the field and a total of eleven soil samples were collected from the four pits. *Copies of the actual field data sheets are not provided with the amendment submittal.*

The amendment contains an Order-I soils map delineating each soil, sampling locations and soil descriptions for each map unit (Figure 3.1-1). The map scale 1:360 is within the required 1:15,840 or larger scale for Order-I surveys. Likewise, the 0.91 acre surveyed site is within the minimum delineation size (2.5 acres) for an Order-I soil survey. *No elevation markers are given for identifying the map contour intervals. No bar scale is provided to ensure the map's accuracy (e.g., 1" = 30'). In addition, the Potential Disturbed Area boundary does not encompass the Topsoil Stockpile Area or construction access points to and from the Stockpile.*

### Soils Identification, Description and Characterization

For the Order-I soil survey, the four soil areas described are listed as follows with their respective soil series and taxonomic class:

| MAP UNIT | PIT LOCATION | SOIL SERIES   | TAXONOMIC CLASS <sup>1</sup>                                   |
|----------|--------------|---|--|
| A        | BC-4         | Perma Sandy Loam<br>10-25% slopes                         | loamy-skeletal, mixed, Typic<br>Haploboroll                    |
| B        | BC-3         | Pathead Cobbly Loam<br>35-65% slopes                      | loamy-skeletal, mixed (calcareous),<br>frigid Typic Ustorthent |
| C        | BC-2         | Disturbed Hillside<br>Pathead (C horizon)<br>4-12% slopes | loamy-skeletal, mixed (calcareous),<br>frigid Typic Ustorthent |
| D        | BC-1         | Disturbed Drainage<br>3-8% slopes.                        | None   |

The Order-I soil survey provides (1) a description of each map unit in areas A, B, C, and D; (2) a profile description of each of the soils at the four sample sites, BC1 through 4; and (3) a copy of the soil laboratory data for the eleven soil samples taken from the four sample sites.

Samples were sent to Inter-Mountain Laboratory (IML, Farmington, NM) for analysis

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<sup>1</sup> Jensen, E.H., and Borchert, J.W., 1988. Soil Survey of Carbon Area, Utah Soil Conservation Service, United States Department of Agriculture, Washington D.C.

according to the Division's Guidelines for Management of Topsoil and Overburden<sup>2</sup> and by consultation with Mr. Robert Davidson, DOGM. Parameters analyzed include pH, EC, saturation percent, Ca, Mg, Na, SAR, texture, CaCO<sub>3</sub>, soluble B, soluble Se, TOC, and organic matter.

With the exception of rock fragments, soils have physical and chemical properties that are within DOGM's acceptable range for soil and overburden guidelines. The Division recognizes that native soils contain high percentages of rock fragments, is inevitable and does not present a reclamation hazard. Certainly, to reclaim and restore the land to pre-mining conditions will require soils with indigenous rock fragment volumes and content. Therefore, it is not only acceptable, but desirable to salvage soils containing intrinsic rock, gravels, cobbles and boulders.

### **Findings:**

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

**R645-301-120**, Copies of the actual field data sheets are not provided with the amendment submittal.

**R645-301-140**, (1) Although the soils map is contoured, no elevation markers are given for identifying the map contour intervals. (2) No bar scale is provided to ensure the map's accuracy (e.g., 1" = 30'). (3) In addition, the Potential Disturbed Area boundary does not encompass the Topsoil Stockpile Area or construction access points to and from the Stockpile.

## **OPERATION PLAN**

### **TOPSOIL AND SUBSOIL**

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

### **Analysis:**

The Order-I soil survey for Barn Canyon Air Ventilation/Fan Shaft site includes discussion of topsoil suitability and potential soil salvage depths for each of the four soil map units as follows:

- Topsoil Salvage

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<sup>2</sup> Leatherwood, James, and Dan Duce. 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. Salt Lake City, Utah.

- Short-Term Soil Storage
- Long-Term Soil Storage
- Topsoil Salvage Summary

### **Topsoil Salvage**

Soil salvage recommendations are based on the Order-I soil survey which identifies topsoil suitability and volumes calculated for each of the four soil map units. Soil will be salvaged prior to construction and will include long-term and temporary soil storage. The Permit Area encompasses 0.91 acres. Within the Permit area is the Potential Disturbed Area (0.36 acres) and The Topsoil Stockpile Area (an additional 0.096 acres). The Stockpile should be included within the Potential Disturbed Area boundary (see soil resource section).

*Map Unit A, Perma sandy loam*, is mapped in an undisturbed area under predominantly Gambel's oak vegetation. An average 2 feet of suitable soil is available for salvage and will include a 0.03 acres. Pockets of soil salvage may reach depths of 35 inches, but are not included within the projected soil salvage volumes. An additional 0.009 acres of Perma soil is located in the area behind the to-be-built retaining wall.

*Map Unit B, Pathead cobbly loam*, is mapped in an undisturbed area under mixed vegetation including scattered Juniper. An average of 18 inches of suitable soil is available for salvage. In the affected area, it occupies 0.13 acres with an additional 0.12 acres of soil located behind the to-be-built retaining wall.

*Map Unit C, disturbed hillside*, is located in an old disturbed side-hill cut where a pad site was created. Present vegetation consists of mixed grasses and some sagebrush. Six inches of this soil will be salvaged and stored in the long-term topsoil stockpile.

*Map Unit D, disturbed drainage*, is located adjacent to the main dirt road in Barn Canyon and includes the Barn Canyon drainage channel bottom areas. No soil salvage will occur from this unit because the exposed surface soils are compacted and the underlying soil substratum contain greater than 65% total gravels, cobbles and stones.

### **Short-Term Soil Storage**

In the area behind the to-be-constructed retaining wall, soils will be salvaged and placed in a short-term topsoil storage pile. Reapplication of the temporarily stored soils to the soil surface will occur subsequent to completion of back-filling and grading behind the newly constructed wall. *The amendment does not disclose where the short-term storage pile will be placed nor does it describe methods to protect soil resource during storage.*

### Long-Term Soil Storage

A portion of the soil salvaged will be placed in long-term storage. The topsoil stockpile will be located immediately south of the ventilation pad area.

### Topsoil Salvage Summary

Potential topsoil salvage depths and volumes are summarized for each of the four soil map units in the following table:

| MAP UNIT     | AVERAGE SOIL SALVAGE DEPTH (INCHES) | LONG-TERM STORAGE (CUBIC YARDS) | SHORT-TERM STORAGE (CUBIC YARDS) |
|--------------|-------------------------------------|---------------------------------|----------------------------------|
| A            | 24                                  | 91.4                            | 29.8                             |
| B            | 18                                  | 317.3                           | 296.6                            |
| C            | 6                                   | 39.3                            | -                                |
| D            | 0                                   | -                               | -                                |
| <b>Total</b> | <b>-</b>                            | <b>448.0</b>                    | <b>326.4</b>                     |

### Findings:

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

**R645-301-234.100 through R645-301-234.240**, The amendment does not disclose where the short-term storage pile will be placed or methods to protect the soil resource.

## RECLAMATION PLAN

### TOPSOIL AND SUBSOIL

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

### Analysis:

A summary of topsoil volumes available for reclamation is given for both long-term and short-term soil storage. Short-term storage soils will be used to reclaim the area behind the retaining wall subsequent to completion of construction. Long-term storage soils will be used during final reclamation at

mine closure. The following table breaks down disturbance acreage and soil replacement depths according to reclamation periods:

| <b>Reclamation Period</b> | <b>Potential Disturbance Area (acres)</b> | <b>Long &amp; Short Term Stockpiled Soil (cubic yards)</b> | <b>Soil Replacement Depth (inches)</b> |
|---------------------------|---|--|--|
| Interim                   | 0.13                                      | 326.4  | 18.5                                   |
| Final                     | 0.23                                      | 448  | 14.5                                   |
| <b>Total</b>              | <b>0.36</b>                               | <b>774.4</b>   | <b>16.0</b>                            |

No further information is provided for reclamation commitments of the ventilation disturbance area other than those generally contained in existing Mine Reclamation Plan.

**Findings:**

The information provided meets the regulatory requirements of this section.