State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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June 22, 1999

Chris Hansen
Canyon Fuel Company
HC 35 Box 380
Helper, Utah 84526

Re: As -Built Plans for Reconstruction of Permanent Undisturbed Drainage Diversion, Mountain Coal Company, Gordon Creek #2, #7, & #8, ACT/007/016-99B, File #2, Carbon County, Utah

Dear Mr. Hansen:

The referenced amendment has been reviewed by Senior Reclamation Specialist Dave Darby. The technical analysis provided for your review is based on information submitted May 26, 1999 and the site visit of June 16, 1999. Your response by July 6, 1999 is appreciated.

The operator was required to reconstruct portions of the undisturbed runoff channels after the landowner regraded the surface in late September 1998. The reconstruction took place in November, the Division received as-built cross-sections for the channels crossing the Gordon Creek #2 Mine pad on March 5, 1999. The plans were found to be deficient, since no calculations accompanied the cross-sections.

Designs were again submitted on May 26, 1999 which provided reference material and calculations for design specifications.

The information and calculations were analyzed and found to meet partial design standards, however long term reclamation standards might not be met. The following information provides reasoning for the deficiency.

RECLAMATION PLAN

HYDROLOGIC INFORMATION

Regulatory Reference: R645-301-742, -301-761.

Analysis

The applicant submitted updated Final Reclamation Map, Plate 3-7, and a Plate (Plate 7-9B) identifying a cross-section for each channel. Channel designs were submitted for channels, SD-4, SD-5 and SD-6 (See Plate 3-7 and 7-9B). Calculations were submitted using the Soil Conservation Service

(Natural Resources Conservation Service) runoff method.

Particular attention was paid to channel SD-5 because of its shallow appearance and because it is located just above the access road. Any flow topping the channel could likely flow down the road, causing more erosion and damaging the surface.

The cross-section measured by the consultant shows a trapezoidal channel with a cross-sectional area of 7 square feet, with a depth of about 1.5 feet. During an inspection on May 28, 1999, the DOGM inspector measured the channel and derived a cross-sectional area of 4 square feet, with a depth of about 7.5 inches. Channels were sized by the Division using the triangular channel cross-section and Manning roughness coefficient of 0.035.

R645-301-742.333 requires that all permanent miscellaneous diversions be sized to pass safely the runoff generated from a 10 yr-6hr precipitation event. Since SD-5 is intended to remain after reclamation, it falls into this category.

The measurements obtained by the inspector was entered into the FlowMaster hydrologic program to calculate depth of flow in the channel using the discharge provided by the applicant. The flow level (triangular design measured by the inspector)for the 10 yr-6 hr precipitation event, using a curve number of 63 provided by the applicant)came to 0.5 ft, leaving a freeboard of 2.5 inches (inspector's measurement).

The curve number, 63, was accepted by the Division when the reclamation plans were submitted. Essentially, the applicant has provided information required by the regulation, however the size of the channel and its location is a concern. The division normally uses a standard curve number of 75 for the undisturbed terrain. A curve number of 75 yields a peak flow depth of .91 ft for the channel measured by the inspector. If this curve number was used in the calculations the channel would not hold the 10 yr-6 hr flow. Curve numbers are not necessarily exact and a soil survey would have to be conducted to get the detailed information. Antecedent moisture conditions could also change the curve number as we have seen in the past with previous storms. The site should be reevaluated by the applicant and the inspector.

Findings

The applicant has provided information to show the channels will pass the design flows specified in the regulation. Channels SD-4 and SD-6 (Plate 3-7) are deeply incised and should pass the design storms calculated by the applicant and flows calculated with a curve number of 75. Channel SD-5 appears shallow at one section, calculations submitted by the applicant confirm that the flow from 10 yr-6 hr precipitation event will be contained using the curve number of 63.

It is recommended that Channel SD-5 be reevaluated to ensure it will remain stable, in accordance with R645-301-742312.1. and safely pass the flows to provide protection against flooding, R645-301-742312.2.

The main point is that the channel appears borderline (using various coefficients in the calculations) to control flows that may be generated by the design storm. It would be easier and save time to ensure the channel is properly designed now than to conduct mitigation repairs later.

It is also recommended that a reevaluation of the channel be conducted. The channel should be measured while the inspector is on site to ensure that the cross-section in question is measured. Hydrologic designs should be submitted which incorporate antecedent moisture conditions in accordance with R645-301-742.314.

If you have any questions please call.

Sincerely,

Joseph C. Helfrich
Permit Supervisor

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cc: Dan Guy, Blackhawk Engineering
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