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DIVISION OF OIL, GAS AND MINING

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TO: Internal File

FROM: *PB* Priscilla Burton, Sr. Reclamation Specialist/Soils and Team Lead

RE: Phase II Bond Release Hardscrabble, Castle Gate Holding Company, Castle Gate Mine, C/007/004-BR02B

SUMMARY:

Castle Gate Holding Company applied for Phase II bond release for the Hardscrabble No. 3 and No.4 Mine areas of the Castle Gate Mine, 36.5 acres in all. Phase II bond release may be approved after successful revegetation is completed and erosion is controlled to prevent suspended solids to streamflow and prohibit runoff outside of the permit area (R645-301-880.320).

Earthwork at the Hardscrabble site was completed during the years 1984, 1985, and 1993 through 1999. Phase I bond release was approved for Goose Island (8.79 acres) in 1985. Phase I bond release was approved for Hardscrabble No. 3 and No. 4 Mine areas (27.7 acres) on February 14, 2001.

This submittal, received May 10, 2002 along with supplemental information arriving November 15, contains vegetation and sediment yield information.

OK

TECHNICAL MEMO

TECHNICAL ANALYSIS:

RECLAMATION PLAN

TOPSOIL AND SUBSOIL

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

Analysis:

Redistribution

Information concerning the redistribution of topsoil and subsoil was reviewed in the Division's Phase I Bond Release Decision Document dated November 29, 2000. According to the technical review, final soil placement depth averaged 24 inches. Coal debris, coal refuse and any acid- and/or toxic-forming material exposed or excavated during reclamation was covered with four feet of overburden material and substitute soils.

Findings:

The information provided meets the requirements for bond release.

STABILIZATION OF SURFACE AREAS

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

Analysis:

The Division conducted an inspection of the site on August 22, 2002. During that inspection, the Division noted that the regrading and gouging performed in 1999 at Goose Island is controlling erosion. The presence of rills and gullies are very few, located on a gouged slope on the west side of the road between Mine No. 4 and Goose Island. The sediment from the rills is being washed into the roadside ditch, but is not leaving the site. The rills were photographed and can be seen in the images folder for the mine, dated 08222002.

Two problem areas were noted in the Technical Analysis of the Phase I bond release dated November 29, 2000. The first was the area near the old scalehouse used for equipment staging and screening soil for riprap. The area was noted as having poor vegetation re-establishment due to limited soil structure (compaction). On August 22, 2002, the Division

noted that the area is still limited in vegetation cover, but gouges on the site are retaining all flow on the site and no erosion was noted. The area was photographed.

A second problem area noted during Phase I bond release is the area identified by soil sample HCRD-6. This area covers about 1000 square feet and is elevated on a bench above the canyon floor. The site is very steep with the soil at the angle of repose. There is some vegetation growing on the soils, but the site remains mostly uncovered by vegetation or litter. Despite the lack of cover, there are no rills or gullies on the area. All drainage appears to flow to the low point of the fill at the cliff's edge. Below the cliff, the sediments are captured in gouges.

Appendix 2 of the Application for Phase II Bond Release provides a comparison of the sediment yield in tons/acre/year for the reclaimed slopes under existing conditions to the reclaimed slope assuming reference area cover. The comparison was run using the Revised Universal Soil Loss Equation by EarthFax Engineering, Inc.

The assumptions built into the model are as follows:

- The soil erodibility factor (K) for the control (hypothetical undisturbed site) was based upon the association of 45% Pathead, 25 % Curecanti and 30% other soils described by the Soil Survey of the Carbon Area, 1988, UDSA, SCS (Appendix 3.3E) and was considered to be $K = 0.27$.
- The K factor for the reclaimed land was based upon the average texture of fifteen composite samples taken in 1996 from trenches prior to reclamation in 1996 (Appendix 3.3M) and was considered to be $K = 0.30$.
- The reclaimed soils were also assumed to have a moderate to rapid permeability, based upon the field notes in Appendix 3.3M.
- The very fine sand fraction is assumed to be 5%.
- The reclaimed soils were assumed to have 0% organic matter.
- Slope was assumed to be 30% (3.5 h : 1 v) for both the control and reclaimed conditions.

EarthFax found that sediment yield from the reclaimed site varied from 0.51 tons/ac/yr down to 0.16 tons/ac/yr depending upon the extent of gouging. EarthFax arrived at an average of 9.0 tons/yr sediment from the entire 36.5 acre site as compared to a projected 21.5 tons/yr for the control which is described as the same site with no gouging and a vegetation cover equivalent to that of the reference area.

Whether this model demonstrates erosion control depends upon the acceptable soil loss tolerance value for the soils of the site. The Natural Resources Conservation Service (formerly the Soil Conservation Service) identified the soil loss tolerance value for the Pathead and Curecanti soils as 1 ton/acre/year in Table 12 of the 1988 Soil Survey of Carbon Area. The consultant's prediction of 0.16 to 0.51 tons/acre/year falls below this soil loss tolerance value.

TECHNICAL MEMO

Findings:

The Permittee has adequately applied best management practices to control erosion and prevent sediments from leaving the site.

RECOMMENDATIONS:

The site is recommended for Phase II bond release.

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