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November 24, 1997

TO: Pamela Grubaugh-Littig, Permit Coordinator *pgl*  
 THRU: Joseph C. Helfrich, Permit Supervisor *JCH*  
 FROM: Susan M. White, Senior Reclamation Biologist *SMW*  
 RE: Phase III Bond Release, Gordon Creek #3 and #6 Mines, Mountain Coal Company, ACT/007/017, Folder #3, Emery County, Utah  
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**Summary**

Mountain Coal Company submitted Application for Phase III Bond Release (Supplement) for the above referenced mine; date received August 11, 1997. A bond release site inspection was conducted October 23, 1997. Mountain Coal Company completed reclamation at its Gordon Creek Nos. 3 and 6 Mines in the fall of 1986, thus meeting the minimum 10 year liability period in the fall of 1995. The site is recommended for Phase III bond release. The below Technical Analysis is a review of the Application.

**TECHNICAL ANALYSIS:**

**VEGETATION**

**Regulatory Reference:** 30 CFR Sec. 785.18, 817.111, 817.113, 817.114, 817.116; R645-301-244, -301-353, -301-354, -301-355, -301-356, -302-280, -302-281, -302-282, -302-283, -302-284.

**Analysis:**

**Standards for Success.**

The Application for Phase III Bond Release presented information from vegetation sampling in 1995 and 1996. Vegetative cover, production, diversity, and shrub densities were sampled as required by the permit and Division's Vegetation Information Guidelines. Minimum samples size were met when sampling for vegetative cover. The regulations, for areas previously disturbed by mining that were not reclaimed, are that the vegetative ground cover will be not less than the ground cover existing before redisturbance and will be adequate to control erosion and achieve the approved postmining land use. The Division's current interpretation is that continuously mined sites also apply to this standard.

R645-301-357 states that the vegetation parameters will equal or exceed the approved success standard during the growing seasons for the last two years of the responsibility period and that, in areas of less than 26 inches or less average annual precipitation, the period will be for not less than ten full years.

The Gordon Creek Nos. 3 and 6 Mines were continuously mined. The site has been reseeded and has met the 10 year period of responsibility requirement. The operator has also sampled the agreed vegetation parameters for the last two years of the growing season, 1995 and 1996. The permit states (page 3-67a) that the reclamation will be considered successful if the reclaimed area compares to the sagebrush-grass reference area and has 37 percent vegetative cover, 640 pound per acre production, and 1000 shrubs per acre.

No diversity standard was proposed in the permit. The bond release application proposed to use the MacArthur Index. The MacArthur Index ( $1/\sum p_i^2$ ) integrates the number of species and the degree to which frequency of occurrence was equitably distributed among those species.

Table 1: Success standard comparisons for the reclaimed area and the sagebrush-grass reference area at the Gordon Creek Nos. 3 and 6 Mines.

	Cover (%)	Production (lbs./acre)	Density (#/acre)	Diversity ( $1/\sum p_i^2$ )
Reclaimed 1995	51	1100	1945	11.11
Reference 1995	43	408	7966	5.58
Reclaimed 1996	60	823	1814	9.09
Reference 1996	47	366	7318	6.25

The 1995 and 1996 cover data meets the requirements of the permit and the regulations. Total vegetation cover in 1995 of the reclaimed area was 51 percent and in 1996, 60 percent. The sagebrush-grass reference area had a total vegetative cover of 43 percent and 47 percent in 1995 and 1996, respectively.

The production of the reclaimed area in 1995 (1100 lbs./acre) and 1996 (823 lbs./acre) was significantly greater than the total annual biomass from the associated reference area in 1995 (408 lbs./acre) and 1996 (366 lbs./acre). The minimum sample size requirements were only met for the reference area in 1995 and the reclaimed area in 1996. However, the regulations do not require previously mined sites to meet a production standard. A

demonstration of meeting and exceeding the undisturbed vegetative productivity is an indication of the site conditions meeting the postmining land use.

The reclaimed site woody plant density meets the requirements of the permit and the regulations. Woody species densities were less on the reclaimed area in 1995 (1945 plants/acre) and 1996 (1814 plants/acre) than in the associated reference area in 1995 (7966 plants/acre) and 1996 (7318 plants/acre). However, the technical standard of 1000 shrubs per acre was met in 1995 and 1996. Minimum sample size was not obtained in the 1995 sampling, however, the regulations do not require a previously mined site to meet a shrub density standard. Meeting and exceeding the technical standard for woody plant density is a demonstration of meeting the postmining land use for wildlife habitat.

The MacArthur's diversity index indicates that diversity is greater in the reclaimed area for both 1995 and 1996 (11.11 and 9.09, respectively) than in the reference area for 1995 and 1996 (5.58 and 6.25, respectively).

A site inspection was conducted by the Division on October 23, 1997 to assess the site for the Phase III bond release. The site appeared to be meeting the post mining land use of grazing and wildlife. Vegetation was established on the disturbed and affected areas. Musk thistle and field bindweed were observed growing on the upper pad area. These are listed as noxious weeds in Utah. The Operator stated that the area had been recently treated for noxious weeds. Over the years the areas infected have remained somewhat constant and noxious weeds appear to be under control although not eradicated. Noxious weed control is expected to continue since the county also requires land owners to control noxious weeds.

The post mining land use for the site is wildlife habitat and livestock grazing. Use of the area by elk, deer, horse, and sheep was apparent inside the fenced site. Heavy use of the permit area by sheep was apparent. The upper cell of the two cell sediment pond contained water.

**Findings:**

Information provided in the bond release application meets the minimum regulatory requirements for Phase III bond release.

**RECOMMENDATION:**

Approve Phase III bond release for the Gordon Creeks Nos 3 and 6 Mines.