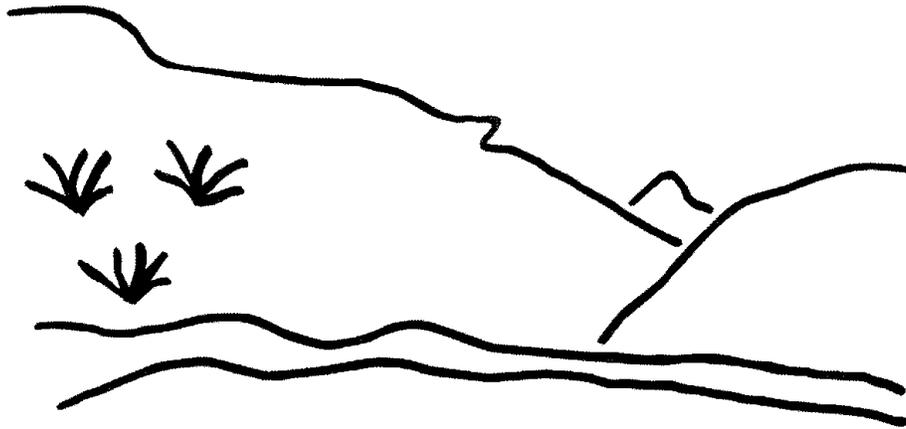


State of Utah



Utah Oil Gas and Mining

Coal Regulatory Program

Castle Gate Mine
Phase II Bond Release Sowbelly
C007/004-BR02A
Technical Analysis
January 21, 2003

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TECHNICAL ANALYSIS

The Division ensures compliance the Surface Mining Control and Reclamation Act of 1977(SMCRA). When mines submit an application for bond release, the Division reviews the proposal for conformance to the R645-Coal Mining Rules. This Technical Analysis is such a review. Regardless of these analyses, the Permittee must comply with the minimum regulatory requirements as established by SMCRA.

Readers of this document must be aware that the regulatory requirements are included by reference. A complete and current copy of these regulations and a copy of the Technical Analysis and Findings Review Guide can be found at <http://ogm.utah.gov/coal>

This Technical Analysis (TA) is written as part of the bond release review process. It documents the Findings that the Division has made to date regarding the application for bond release and is the basis for permitting decisions with regard to the application. The TA is broken down into logical section headings. Only those sections that pertain to Phase II bond release have been analyzed. Specific findings are provided which indicate whether or not the application is in compliance with the Regulations.

INTRODUCTION

INTRODUCTION

Earthwork at the Sowbelly site was completed during the years 1993, 1994 and 1995. During 1995, 15.25 acres of the 21 total disturbed were gouged. Phase I bond release was approved for the site on January 30, 1997

On May 10, 2002, Castle Gate Holding Company applied for Phase II bond release for the Sowbelly Canyon area of the Castle Gate Mine, 18.2 acres of 21 acres disturbed. On September 9, 2002, the Division requested additional information before the technical review of the application could be completed. The supplemental information was received on November 15, 2002.

The Phase II bond release application contains vegetation and sediment yield information and a copy of the public notice. 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). The Permittee has met the minimum requirements of this regulation for Phase II bond release.

The Bond Release Directive Tech-006 (dated September 5, 2000) and Utah Regulations R645-301-880.100 through 880.310 guided this review of the bond release application.

Phase II bond release is recommended for 18.2 acres in Sowbelly Canyon. Since bond release will be granted in the year 2003, but Map EX.3.2-13.DWG, Sowbelly Canyon As-Built Topography and Treatment Map, shows Phase II bond release in 2002, Plateau Mining Corp. has agreed to alter the final copies of maps to read 2003.

GENERAL CONTENTS

GENERAL CONTENTS

IDENTIFICATION OF INTERESTS

Regulatory Reference: 30 CFR 773.22; 30 CFR 778.13; R645-301-112

Analysis:

Castle Gate Holding Company has held the permit on the Castle Gate Mine since September 11, 1998. The Mining and Reclamation Plan has a complete discussion of the company's structure in Chapter 2.

Findings

The information provided is adequate for the purposes of Phase II bond release.

LEGAL DESCRIPTION AND STATUS OF UNSUITABILITY CLAIMS

Regulatory Reference: 30 CFR 778.16; 30 CFR 779.12(a); 30 CFR 779.24(a)(b)(c); R645-300-121.120; R645-301-112.800; R645-300-141; R645-301-115.

Analysis:

The mine site is located in Sowbelly Canyon approximately 4 miles northwest of Helper, Utah. The site is located on the Standardville, Utah, U.S. Geological Survey 7.5 minute quadrangle map and is described as follows:

Township 13 South, Range 9 East, SLB&M, Utah

Section 4: NW1/4SW1/4, SW1/4 SW1/4

Section 9: NW1/4 NW1/4

Findings:

The information provided is adequate for the purpose of Phase II bond release.

PUBLIC NOTICE AND COMMENT

Regulatory References: R645-301-880.120.

Analysis:

Appendix 3 of the submittal includes a copy of the public notice. The advertisement contains all the information required by R645-301-880-120. An affidavit of publication has been provided and is dated August 6, 2002.

Appendix 4 of the application contains copies of notification letters sent to adjoining property owners: Mr. Gary Harwood, American Electric Power Service Corp., the Bureau of Land Management; and local governmental bodies: the County Commission, the Carbon County Road Department, Carbon County Planning and Zoning.

Findings:

The information provided meets the requirements of the Regulations.

COMPLETENESS

Regulatory Reference: 30 CFR 777.15; R645-301-150.

Analysis:

All activities have been accomplished in accordance with the requirements of the Surface Mining and Control Act of 1977 as evidenced by the Division's approval of the As-Built drawings submitted with the Phase I bond release application, which was approved January 30, 1997. The Phase II bond release application contains a notarized C1C2 form certifying the truthfulness of the information submitted.

Findings:

The information provided in the bond release application meets the minimum certification requirements for Phase II bond release.

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GENERAL REQUIREMENTS

Regulatory Reference: R645-301-880.320

Analysis:

Phase II Bond Release may be granted after revegetation has been established in accordance with the approved reclamation plan so long as the lands to which the release is applicable are not contributing suspended solids to streamflow or runoff outside the permit area in excess of the requirements set by UCA 40-10-17(j) of the ACT and by R645-301-751. No permanent impoundments have been retained on this site.

The Division staff has reviewed the submittal for Phase II bond release with this guidance in mind.

Findings:

The information provided is adequate for the purposes of Phase II bond release.

POSTMINING LAND USES

Regulatory Reference: 30 CFR Sec. 784.15, 784.200, 785.16, 817.133; R645-301-412, -301-413, -301-414, -302-270, -302-271, -302-272, -302-273, -302-274, -302-275.

Analysis:

The postmining land uses are wildlife habitat and grazing. The area contains critical elk winter range, so grasses, particularly tall grasses, are important for the postmining vegetation. Grasses are also important for grazing.

The Permittee has met the Phase II bond release requirement for land use. The site is being used as wildlife habitat, but it has not yet been grazed. Although the vegetation cover is dominated by grasses, there is a good mix of forbs and shrubs included. The utility of these species for the postmining land uses is discussed in further detail in other sections of this analysis.

Findings:

Information provided in the application is adequate to meet the requirements of this section of the regulations.

PROTECTION OF FISH, WILDLIFE, AND RELATED ENVIRONMENTAL VALUES

Regulatory Reference: 30 CFR Sec. 817.97; R645-301-333, -301-342, -301-358.

Analysis:

The mining and reclamation plan says wildlife habitat enhancement will be created by the development of micro-topographic features, such as swales and rises created during regrading; using the species in the seed mixes; creating snags and roosts where materials are available; and by making wetland areas wherever topography and hydrology lend themselves to their creation.

In Sowbelly Gulch, it was not possible to create as many habitat features as originally envisioned. Materials for roosts and snags did not become available, and there were no continually-available water sources that could be used to create wetlands. Some large rocks were intentionally placed on the surface, and much of the site was gouged which helps to enhance vegetation.

In general, the species that have become established are more desirable for wildlife forage than the species in adjacent undisturbed areas. The dominant species in surrounding undisturbed areas are Salina wild rye and sagebrush, and while sagebrush is used extensively by big game, Salina wild rye is not palatable. By contrast, the dominant species in the reclaimed area are all rated as having fair or better palatability.

Adjacent undisturbed areas have, in addition to those areas dominated by sagebrush and Salina wild rye, patches of oak, maple and conifers that provide good cover for wildlife. The reclaimed area does not have this same small tree component, but this is not critical because the reclaimed area is relatively small and narrow with good cover nearby. The reclaimed area does have areas of taller shrubs and grasses, especially rabbitbrush and basin wild rye. The Division considers that the area has been enhanced as wildlife habitat.

Findings:

The Permittee has met the minimum requirements of this regulation for Phase II bond release.

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BACKFILLING AND GRADING

Regulatory Reference: 30 CFR Sec. 785.15, 817.102, 817.107; R645-301-234, -301-537, -301-552, -301-553, -302-230, -302-231, -302-232, -302-233.

Analysis:

General

The disturbed area at the Sowbelly complex is 21.0 acres and is divided as follows:

- 15.25 acres reclaimed 1993-1994 and 1995.
- 2.14 acres of highwall associated with 1995 reclamation.
- 0.81 acres of undisturbed ground within the disturbed area.
- 2.8 acres associated with the substation reclaimed in 2002.

The Sowbelly Canyon portion of the Castle Gate Mine was reclaimed and given Phase I bond release January 30, 1997. On May 10, 2002, the Division received an application for Phase II bond release for 18.2 acres. That is all of the disturbed area except the substation.

During the Phase I bond release inspection, the Division found that all backfilling and grading, topsoil placement and drainage construction were properly done. In evaluating the Phase II bond release application, the Division will determine if vegetation has been established in accordance with the approved mine plan. No specific engineering requirements will be looked at during Phase II bond release. Should the Division find that slides or drainage failures have occurred the Division will require the Permittee to take appropriate action.

Findings:

The Permittee has met the minimum requirements for this section of the regulations.

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 Decision Document dated November 29, 1996. Areas of concern were noted at soil test pit locations SB-2, SB-3, SB-4, SB-5 SBG-1, SBG-2 (shown on Figure 1 of Appendix

3-2B of the MRP). According to the technical review, coal debris, coal refuse and sodic material exposed or excavated during reclamation was covered with between two to six feet of cover.

During an inspection of the site on August 22, 2002, the Division noted sparse cover in the vicinity of SB-3, although no rills or gullies were noted at the site. Gouges pocked into the soils were still very evident in the location of SB1 and 2.

Findings:

The information provided meets the requirements for bond release.

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 784.14, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-301-512, -301-513, -301-514, -301-515, -301-532, -301-533, -301-542, -301-723, -301-724, -301-725, -301-726, -301-728, -301-729, -301-731, -301-733, -301-742, -301-743, -301-750, -301-751, -301-760, -301-761.

Analysis:

Groundwater Monitoring

Sowbelly Canyon has no groundwater monitoring points or wells.

Surface Water Monitoring

Sowbelly Canyon has two surface water monitoring points, one above the former disturbed area and one below that area. These points are monitored now and will continue to be monitored until final bond release. There are no wells in Sowbelly Canyon.

Sediment control measures

A field visit was made to Sowbelly Canyon on August 22, 2002. The revegetation has been proceeding well over the last 6 years. Vegetation has grown with considerable diversity. While the plant density varies somewhat over the entire project, all the plants are doing well. They do show some stress from the current dry year. The mounds and depressions are still at about 50 % their original height since the last two years have been drought years. In terms of sediment loss, the reclaimed area is at least as good, or better, than surrounding native areas. Although there is localized erosion and deposition (on the order of 20 feet), overall it's obvious no sediment has been lost from the site. No significant rills or gullies were found.

The reclamation methods have minimized disturbance to the hydrologic balance within the permit and adjacent areas and have prevented material damage outside the permit area. The

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area can now support the approved postmining land use. The roughening and seeding method has proven successful at many Utah coal mine reclamation projects and is working well at these sites. Thus, this reclamation is using the best technology currently available to prevent additional contributions of suspended solids to streamflow. There is no evidence of pollution of surface and subsurface waters, and it appears very unlikely there will be future occurrence of such pollution.

Findings:

Sediment control provided by the roughened ground and established vegetation is sufficient for Phase II Bond Release.

REVEGETATION

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:

Revegetation: Standards For Success

Standards

According to the mining and reclamation plan, revegetation success will be judged by comparing vegetation life forms in the reclaimed and reference areas using the Motyka index. The Motyka index is a similarity index, and the calculated similarity between the reclaimed area and the reference area must be at least 70 percent or the percent similarity calculated between samples in the reference area, whichever is less. The reclaimed area is considered to have met the diversity standard if it meets this criterion.

Other performance standards in the rules include erosion control, seasonality, and utility for the postmining land use. The species must be native to the area and capable of regeneration and succession. Some of the revegetation success standards that would normally be applied, such as production, woody plant density, and cover, are not included as success standards because the site was previously disturbed. For this same reason, the reference area used is not an undisturbed area but is a site successfully reclaimed by the Utah Abandoned Mine Land Reclamation program.

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Species Composition and Seasonality

The calculated similarity between the reclaimed and reference areas is 89.73 percent. This meets the success standard. In addition, the applicant presents information showing that the cover in the reclaimed area is not statistically different from the cover in the reference area and that diversity in the reclaimed area is greater than the diversity in the reference area.

The mining and reclamation plan contains baseline vegetation cover data from 1981 for two undisturbed reference areas in Sowbelly Gulch that are no longer part of the success standards. Although a comparison of cover values between the reclaimed area and these undisturbed areas is not required by the plan, the reclaimed area has more cover (47.33%) than the Sowbelly grass-sage reference area (38.9%) and very similar cover to the Sowbelly mixed brush reference area (47.7%). Therefore, even if this was a post-law site where topsoil had been salvaged and comparison to undisturbed areas was required, the reclaimed area would meet the bond release vegetation cover requirements.

The required minimum sample sizes were 12 and 14 for the reclaimed and reference areas, and the Permittee took 80 and 40 samples in these areas, respectively.

Species Composition

The section of this analysis titled "Protection of Fish, Wildlife and Related Environmental Values" discusses utility of the vegetation for the wildlife habitat postmining land use. The same principles of forage palatability discussed in that section apply to the grazing land use.

During the bond release inspection on August 22, 2002, no noxious weeds were found on the site. Some noxious weeds have been found in the reclaimed area in the past, but the Permittee has worked actively to eradicate them. The rules allow continued efforts to control these weeds through the entire period of extended responsibility for successful revegetation.

Although the vegetation study included with the application for bond release shows some species that are not native to the area, cover from these species was, for the most part, minor. Except for yellow sweet clover, total cover from these species was 2.32 percent and relative cover 4.90 percent. Cover from yellow sweet clover was 7.48 percent, higher than any other species, but under the environmental conditions found at this site, yellow sweet clover should not persist. There is evidence sweet clover is dying out: the vegetation measurements were taken in 2000, but during the bond release inspection two years later, we found little or no yellow sweet clover.

The only warm season species found in either the reclaimed area or the reference area was fourwing saltbush although some of the cool season species, such as Indian ricegrass and

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Salina wild rye, display some warm season characteristics without actually having the C₄ metabolic pathway. There was substantially more fourwing saltbush in the reference area than the reclaimed area (6.25% compared to 0.44%), but the similarity in seasonality between the two areas was still high (89.85%) using the Motyka Index to calculate the comparison. Although the plan does not include a seasonality success standard, the Division considers this degree of similarity to be adequate.

Erosion Control

During the bond release inspection, we found no rills, gullies, or other signs of accelerated erosion. This is due to several factors including some of the reclamation practices the Permittee used. Most of the site was gouged or contour furrowed, and these roughening techniques have been very effective in preventing runoff, erosion, and sedimentation. In addition, three of the dominant species in the reclaimed area, western wheatgrass, thickspike wheatgrass, and blueleaf aster, are rhizomatous and very effective at controlling erosion.

Findings:

The Permittee has met the minimum revegetation requirements for Phase II 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 1995 is controlling erosion. There were no rills or gullies noted on the site. The site was photographed and can be seen on the Division's FTP site under images for the mine, dated 08222002.

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 following assumptions are built into the model:

- The soil erodibility factor (K) for both the control and reclaimed land was based upon the average texture composite samples taken in 1996 from trenches prior to reclamation in 1996 (Appendix 3.2B).
- The very fine sand fraction is assumed to be 5%.

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- The reclaimed soils were also assumed to medium or coarse granular structure and slow to moderate permeability based upon the sampling results in Appendix 3.2B.
- The soils were assumed to have 0% organic matter, since the measurement of 1.6%OM noted in Appendix 3.2B was probably related to coal content.
- Average slope was assumed to be 20% (5 h : 1 v) for both the control and reclaimed conditions, based on the topography of the entire area.

EarthFax found that sediment yield from the reclaimed site varied from 0.56 tons/ac/yr down to 0.23 tons/ac/yr depending upon the extent of gouging. EarthFax arrived at an average of 5.42 tons/yr sediment from the 18.2 acre reclaimed site as compared to a projected 9.65 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 0.56 tons/acre/year in ungouged areas falls below this soil loss tolerance value.

Findings:

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

MAPS, PLANS, AND CROSS SECTIONS OF RECLAMATION OPERATIONS

Regulatory Reference: 30 CFR Sec. 784.23; R645-301-323, -301-512, -301-521, -301-542, -301-632, -301-731.

Analysis:

Bonded area map

The Division developed Technical Directive 006 to assist in phase bond release. The items that pertain to the bonded area include the following:

- Maps
 - The Permittee should supply the Division with a map at a scale of at least 1"=500' of the bonded area
 - The map should delineate all disturbed areas

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- The reclamation dates and acreages of all reclaimed areas should be shown
- The operation or reclamation status of each area, such as active, temporary cessation, or phase bond release should be shown.

On Map EX3.2-13.DWG, Sowbelly Canyon As-Built Topography and Treatment Map, the Permittee shows the following:

- The Permittee gave the Division a map of the Sowbelly area at a scale of 1" = 100', which exceeds the requirement of 1"=500'.
- The map shows all areas within the disturbed boundary that have been disturbed, were never disturbed.
- The map shows that 15.25 acres were granted Phase I bond release in 1996, and Phase II bond release for those areas was granted in 2002. Since Phase II bond release was obtained in January 2003, the Permittee has agreed to place this year's date on the final copies of the map.
- The map shows that all areas within the Sowbelly area are either undisturbed or are in reclamation.

The Permittee did not include a summary table in the text but did show the information on Map EX3.2-13.DWG, Sowbelly Canyon As-Built Topography and Treatment Map.

The Permittee stated in the public notice that bond release for 18.2 acres was being sought. The areas for which reclamation is being sought include 15.25 acres of vegetated land, 2.14 acres of cutslopes (not vegetated lands.) In addition to those lands the Permittee is asking for bond release of undisturbed areas within the permit boundary. The undisturbed area contains approximately 0.81 acres ($15.25 + 2.14 + 0.81 = 18.2$ acres). Another way of looking at the numbers is to say that the Permittee wants Phase II bond release on all areas at Sowbelly with the exception of the substation area. The Division will consider all land at the Sowbelly site with the exception of the substation area shown on Map EX3.2-13.DWG to be included in Phase II bond release.

Findings:

The information provided in the bond release application is considered adequate to meet the minimum maps, plans and cross-sections of the reclamation operations requirements of the regulations. The Division should approve Phase II release for 18.2 acres. Since bond release will be granted in the year 2003, but Map EX3.2-13.DWG, Sowbelly Canyon As-Built Topography and Treatment Map, shows Phase II bond release in 2002, the Permittee has agreed to alter the maps to read 2003.

BONDING AND INSURANCE REQUIREMENTS

Regulatory Reference: 30 CFR Sec. 800; R645-301-800, et seq.

Analysis:

Determination of bond amount

Determination of bond amount

Table 1. Summary of bond amounts for the Castle Gate Mine.

	Sowbelly	Hardscrabble	Adit No. 1	Total
Acres	21	39	3	63
Current Bond Amount	\$369,946	572,000	\$129,054	\$1,071,000
Amount Proposed for Release	(\$136,946)	(\$253,900)		(\$390,846)
Bond remaining for Phase I work		\$83,100		
Revegetation Cost	233,000	\$235,000		
Bond Amount remaining	\$233,000	\$318,100	\$129,054	\$680,154

The Division calculated the revegetation costs and reclamation costs at the Sowbelly complex to be \$233,000 in 2012 dollars. That amount insures that the Division could reseed the site in the event of bond forfeiture.

Findings:

The information provided in the bond release application meets the minimum bond and insurance sections the regulations.