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 DIVISION OF OIL, GAS AND MINING

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TO: Internal File

THRU:  Priscilla Burton, Project Lead

FROM: Paul Baker, Reclamation Biologist 

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

SUMMARY:

Castle Gate Holding Company has requested Phase II bond release for the reclaimed portions of Hardscrabble Canyon. The area meets the requirements for revegetation and achieving the postmining land uses of wildlife habitat and grazing.

TECHNICAL ANALYSIS:

RECLAMATION PLAN

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.

TECHNICAL MEMO

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. During site inspections, numerous deer and elk have been seen in the area. 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 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.

During the regrading process, numerous large rocks were uncovered, and many of these were used to make rock piles that are being used as habitat by birds and small mammals, particularly in No. 4 Mine canyon and the fan portal highwall areas. Materials for roosts and snags did not become available, but the operator was able to preserve several fully grown cottonwoods by realigning the channel from the position originally proposed. The canyon has a few seeps, but there is not enough water to create wetlands.

The site had been used for mining for many years, and some of the natural cliffs were buried under refuse or material that was sidecast to allow for building construction. During regrading, the operator was able to re-expose some of these cliffs. Other areas were graded to blend into and complement adjacent areas. These techniques have created a diverse landscape that is capable of supporting a varied assemblage of wildlife species.

In general, the plant 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. One common species in the reclaimed area is basin wild rye, a tall grass which is very desirable for wintering elk.

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 has a line of mature cottonwoods along the channel and some small patches of oak that were saved from grading operations. Numerous shrubs and oaks have been planted along the channel and elsewhere, and while these have not yet matured to where they are providing wildlife cover, the Division anticipates this will eventually happen. 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.

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.

TECHNICAL MEMO

Cover, Similarity, and Diversity

The calculated similarity between the reclaimed and reference areas is 70.21 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 (44.82%) than the Sowbelly grass-sage reference area (38.9%) and greater than 90 percent of the cover in 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.

Minimum sample sizes were 15 for the reclaimed area and 13 for the reference area, and the Permittee took 80 and 40 samples for these areas respectively.

Species Composition and Seasonality

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, one musk thistle plant, a noxious weed, was found on the site, and it was dug up. 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 minor. Total cover from these species was 5.19 percent and relative cover 11.58 percent. The dominant vegetation is of species native to the area.

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 Salina wild rye, display some warm season characteristics without actually having the C₄ metabolic pathway. There was more fourwing saltbush in the reference area than the reclaimed area (4.48% compared to 0.94%), but the similarity in seasonality between the two areas was still high (93.07%) 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 two small rills but no 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, and this roughening technique has been very effective in preventing runoff, erosion, and sedimentation. In addition, the two dominant grasses and one dominant forb are rhizomatous and very effective at controlling erosion.

Findings:

The Permittee has met the minimum revegetation requirements for Phase II bond release.

RECOMMENDATIONS:

The permittee has met the revegetation, land use, and wildlife habitat reclamation requirements for Phase II bond release.