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November 6, 2001

TO: Internal File

FROM: Paul B. Baker, Reclamation Biologist *PBB*

RE: Review of Biology Sections of the Emery Deep Mining and Reclamation Plan, Consolidation Coal Company, Emery Deep Mine, C/015/015-AM01B-1

**SUMMARY:**

Other than some aspects of the test plot and interim revegetation plans, the biology portions of the Emery Deep mining and reclamation plan had not been reviewed for several years. On January 29, 2001, the Division sent a review of this section of the Emery plan, and the permittee responded with a submittal the Division received April 10, 2001. The Division's review of this submittal was sent June 12, 2001, and the permittee responded with a submittal the Division received September 10, 2001. This submittal adequately addresses the Division's concerns.

**TECHNICAL ANALYSIS:**

**ENVIRONMENTAL RESOURCE INFORMATION**

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

**VEGETATION RESOURCE INFORMATION**

Regulatory Reference: 30 CFR 783.19; R645-301-320.

**Analysis:**

The mining and reclamation plan shows nine vegetation communities within the Emery Deep permit area. Plate VIII-1 shows the locations of these communities and a surface operations area including proposed disturbances. While it is impossible to know what vegetation

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communities existed in pre-law disturbance areas, adjacent communities are greasewood shrubland, riparian shrubland, and mixed desert shrubland. Other communities that have been or would be disturbed include an annual forb community and riparian meadow.

Dominant species, total cover, and production are shown for the predominant communities, and the plan also includes a list of all species encountered in vegetation sampling.

Appropriateness of the vegetation reference areas is discussed under the revegetation section of this analysis.

**Findings:**

Information provided in the mining and reclamation plan is adequate to meet the requirements of this section of the regulations.

**FISH AND WILDLIFE RESOURCE INFORMATION**

Regulatory Reference: 30 CFR 784.21; R645-301-322.

**Analysis:**

**Fish and Wildlife Information**

Baseline wildlife information is in Appendix IX-1. Most of this information was gathered in a 1980 study which included aerial survey followed by ground truthing. Most of the permit area is critical habitat for ring-necked pheasants. The riparian areas along Christiansen Wash, Quitcupah Creek, and an unnamed stream are also critical wildlife habitats.

A burrowing owl was found near a prairie dog town. While the permittee's consultant only saw one owl and no chicks, the area does appear to have good habitat for this species. Burrowing owls are classified by the State Division of Wildlife Resources as a species of concern because of declining populations.

The only other raptor found in the wildlife survey was an American kestrel. Trees along the streams have some large nests that could be used by raptors, but these nests were not active. There are several species that could make large nests such as these, including both raptors and corvids.

A few deer can sometimes be found in the area, and elk are sometimes forced to come down from higher rangelands because of heavy snow. Pronghorns are not known to occur in the area although there is probably a limited amount of habitat.

The wildlife study included surveys for macroinvertebrates in the streams. Because of poor substrate quality, there is limited potential for macroinvertebrates; however, there are some in certain stretches. Species richness decreases markedly in certain stretches of the stream, and it happens that these are immediately below mine water discharge points. The report explains this is probably due to a change in the substrate quality rather than a result of the effluent; nevertheless, the Division should confirm the conditions discussed in the report.

The permit area contained several white-tailed prairie dog towns, so the consultant searched for any sign of black-footed ferrets and found none.

### **Threatened and Endangered Species**

The information in Section VIII.B.4 has been updated to include a current list of threatened, endangered, and candidate species that might occur in the permit area. None of these species has been found in the permit area although there is some potential that some of these species could occur in the area. The species most likely to be in the area are Wright fishhook cactus (*Sclerocactus wrightiae*), last chance Townsendia (*Townsendia aprica*), and San Rafael cactus (*Pediocactus despainii*).

Additional field work to determine whether these species occur in the permit area is not required at this time; however, if the permittee proposes to disturb new areas, surveys for species potentially in proposed disturbed areas would be needed. In addition, the Division and the Fish and Wildlife Service would need to examine potential effects on the threatened and endangered fish species of the upper Colorado River if the mine begins operating again.

### **Findings:**

Information provided in the mining and reclamation plan is adequate to meet the requirements of this section of the regulations. The Division anticipates no threat to any threatened or endangered species under current operating conditions. The Division should confirm the stream conditions discussed in the consultant's report. If the permittee decides to proceed with any development plans that include new disturbance, the areas to be disturbed will need to be checked for threatened and endangered species. In addition, the Division and the Fish and Wildlife Service would need to examine potential effects on the threatened and endangered fish species of the upper Colorado River if the mine begins operating again.

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## OPERATION PLAN

### FISH AND WILDLIFE INFORMATION

Regulatory Reference: 30 CFR Sec. 784.21, 817.97; R645-301-322, -301-333, -301-342, -301-358.

#### Analysis:

The fish and wildlife protection plan is in Chapter IX, Section 817.97. The primary impacts are reduced habitat in the actual disturbed areas and some reduction of habitat quality in adjacent areas. There is also some disruption of movement patterns.

Mitigative measures include educating mine employees about wildlife, and they are advised to not harass wildlife, particularly during high stress periods. All hazards associated with mining activities are appropriately fenced. Water quantity and quality are maintained in all streams. It appears that power lines were designed to be safe for raptors.

The Division is not aware of additional protective measures that need to be implemented at this time. The permittee is required to use the best technology currently available to protect wildlife and enhance wildlife habitat.

#### Findings:

Information provided in the mining and reclamation plan is adequate to meet the requirements of this section of the regulations.

## VEGETATION

Regulatory Reference: R645-301-330, -301-331, -301-332.

#### Analysis:

Section VIII.C.3 has two species lists that could be used for contemporaneous reclamation. One of the mixes consists primarily of native species, and the other has two aggressive introduced grasses and one native shrub. Because of the difficulty in establishing vegetation at this site, it may be necessary to use the mix with introduced grasses, but, as far as possible, the mix with mostly native species should be used.

The application says simply that an approved seeding method will be used, and the Division assumes this means the methods to be used for final reclamation will also be used for interim revegetation. These methods are acceptable.

**Findings:**

Information provided in the mining and reclamation plan is considered adequate to meet the requirements of this section.

## **RECLAMATION PLAN**

### **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:**

**Timing**

In Section VIII.C.6, the application seeding of disturbed areas will be immediately after site preparation and generally during the late fall planting season. Warm season grasses may be seeded in late spring and summer provided adequate moisture is available. This is consistent with Section III.F.1 and is acceptable.

**Revegetation Techniques**

The mining and reclamation plan says the soil will be tested and amendments added according to these results. Section III.B.1, page 10, now includes a commitment to sample soils under the roads that will be reclaimed.

After grading is completed, the regraded land will be roughened by either ripping or gouging or a combination of these methods. Next, stockpiled topsoil will be redistributed, and low-ground-pressure equipment will be used to rough grade the surface and leave depressions. Based on soil tests, fertilizer may be broadcast or sprayed onto the soil, and this will be incorporated into the soil by surface roughening prior to seeding.

Following the commitments in the application should lead to a well prepared seed bed that will retain as much water as possible. The test plots had varying degrees of success, but the highest vegetation cover was clearly in depressions where water was able to accumulate. It is vital that the permittee follow these commitments; unless the area is irrigated, the Division

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considers a roughened seedbed to be critical to revegetation success at this site. As discussed below, the plan does include irrigation as an option.

Section VIII.C.4 has seed mixes that will be used to revegetate the mixed desert shrub and annual forb community, the greasewood community, and the riparian community. Except yellow sweet clover and alfalfa, every species in the seed mixes is native to Utah. The permittee has reduced the amount of yellow sweet clover to be applied. Alfalfa and yellow sweet clover have been used at other mines and have not generally been aggressive to the point of excluding other species. Yellow sweet clover may help decrease the numbers of weeds and may also be a host for nitrogen fixing bacteria.

The permittee has made other changes to the seed mixes according to Division recommendations. Some of these species, such as trident saltbush, alkali sacaton, and Castle Valley clover, have been very successful at the Emery Deep Mine or at other sites with similarly harsh soil and climate conditions. In addition, the permittee has included the scientific names of all but one of the species in the mixes.

Some species in the seed mixes, including species the Division recommended, may not be available at the time of reclamation, particularly if the permittee does not order them well in advance. The Division recommends that the mining and reclamation plan contain a statement indicating what will happen if seed is not available. The permittee could commit to consult with the Division if this happens and document in the annual report what substitutions were made. The permittee has not chosen to follow this recommendation.

Although it is probably possible to revegetate the site using only seed, some species of transplants were moderately successful in the test plots. The permittee should consider planting seedlings of some species, such as fourwing saltbush and mat saltbush.

Seeding will be done through a combination of drilling and broadcast seeding depending on the seed type and soil conditions. Because of seed size and physiology, some seeds need to stay near the surface. Seeds of other species need to be broadcast simply because of mechanical problems with drilling them. The method will be chosen to minimize leveling of the surface because a roughened surface is essential to revegetation efforts.

The Division does not feel drill seeding should be used, but, as long as some species are broadcast seeded and the permittee is aware of the need to keep the surface rough, the plan is considered acceptable.

According to the application, a protective layer of mulch, organic or inorganic, may be used to control erosion. Noxious weed free straw or hay may be applied at a rate of one or two tons per acre and anchored by crimping, with netting, or by spraying with a chemical binder. Other methods included in the application that might be used to control erosion include terracing,

riprapping, rock check dams, organic tackifiers, wood fiber mulch, and straw bale dikes.

On slopes steeper than 5h:1v where erosion cannot be controlled by organic mulch, rock will be used to armor the soil surface. Large rock, if available, can be placed to help shade slopes and form microclimates and water harvesting on slopes with harsh aspects.

Because the application says mulch "may" be used to control erosion, the Division was concerned that mulch might not be used on slopes steeper than 5h:1v. The commitment now contained in the plan indicates organic mulch will be used on these slopes and that rock will be used if the organic mulch alone does not control erosion. This commitment satisfies regulatory requirements.

Section III.G.2 discusses revegetation and erosion monitoring and maintenance. All rills and gullies nine inches or more deep will be backfilled or graded, reseeded and mulched or otherwise stabilized. Certain other normal conservation practices, such as weed and insect control, will also be used.

Irrigation and fertilization may be used during the first two growing seasons to enhance vegetation establishment. It is unlikely fertilization will have a significant positive effect on vegetation establishment, but irrigation could. The results of trying irrigation on the test plots are not conclusive, but if done right, irrigation could increase vegetation establishment. Before approving irrigation, the Division would need to know the quality of the water, how much and how frequently reclaimed areas would be irrigated, and how water would be applied.

Rule R645-301-357.300 discusses husbandry practices that may be used during the extended responsibility period. The methods discussed in the mining and reclamation plan are acceptable, but they could restart the extended responsibility period for particular areas. The permittee needs to be aware of these restrictions.

### **Standards for Success**

The mine disturbed area includes areas disturbed both before and after passage of the Surface Mining Control and Reclamation Act (SMCRA). The application contains a new paragraph discussing revegetation success standards for areas disturbed before 1977, and the standards discussed in this paragraph are consistent with regulatory requirements. According to the application, standards for adequate revegetation shall follow the demonstration methods of areas affected post August 3, 1977.

Three reference areas were set up as revegetation success standards for areas disturbed after 1977. The application has been revised to show only three reference areas, and their locations are shown on Plate VIII-1.

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The Division normally requires that reference areas be at least one acre, but the greasewood and mixed desert shrub reference areas are about one-fourth acre and the riparian meadow reference area is about 0.06 acres. The application includes a letter from a Natural Resources Conservation Service (NRCS) representative who evaluated the sites and indicated he felt they were adequately sized to be used as reclamation standards. The permittee requested that the Division allow an exception to the one acre recommendation in the guidelines. Based on the recommendation of the NRCS representative and the condition of the sites, the Division is willing to allow an exception to the guidelines.

The reference areas were rated as being in good to high good condition class with some invasive annuals noted in the greasewood area. The Division considers them to be suitable reclamation standards, but they will need to be rechecked when being sampled as comparison standards for final bond release.

The application includes methods for measuring cover and analyzing this information. The methods are consistent with Appendix A of the Vegetation Information Guidelines which is referenced in the rules and thus required. The permittee has acceptably modified a statement indicating when sampling will occur.

After cover information is gathered, weighing factors will be used based on the percentage of reclaimed area being compared to each reference area. While this is not a standard practice, it is satisfactory.

Diversity calculations will be based on a life-form comparison between reference and reclaimed areas. The diversity of reclaimed areas will be considered to have met the success standard if there is a 50 percent or greater similarity of the life forms present between the reference area and the reclaimed plant community. While the application does not specify what methods would be used to make this comparison, it includes the three methods recommended in Appendix B of the Vegetation Information Guidelines. Any scientifically sound comparison method would be acceptable. While similarity indexes do not truly measure diversity, they do make an appropriate comparison between the reclaimed and reference areas. When the permittee applies for bond release, both the Division and the permittee will need to make a qualitative analysis of the diversity of the reclaimed area and the suitability of the species for the postmining land use.

### **Fish and Wildlife**

The species in the revegetation plan meet the requirements of R645-301-342. Not all of these species are particularly palatable, but there must be a balance between those species adapted to the site and the species best for wildlife.

According to the application, best management practices and technology will be applied at the time of reclamation to enhance wildlife habitat. Surface roughening will provide undulating terrain and vegetation that will be conducive to small animals, birds, and rodents.

When reclamation occurs, there may be limited opportunities to enhance the site for wildlife, particularly along the streams. The application includes revegetation plans for these areas that should enhance the wildlife habitat.

**Findings:**

Information in the mining and reclamation plan is adequate to meet the requirements of this section of the regulations.

**RECOMMENDATIONS:**

The permittee has adequately addressed the Division's requirements, and the application can be approved.