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State of Utah
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DIVISION OF OIL, GAS AND MINING

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May 30, 2002

TO: Internal File

THRU: Pamela Grubaugh-Littig, Permit Supervisor

FROM: Priscilla W. Burton, Senior Reclamation Specialist/Soils

RE: Review of Appendix VII revision (dated January 11, 2000), PacifiCorp, Cottonwood/Wilberg Mine, ACT/015/019-AM00A-2

SUMMARY:

On January 19, 2000, the Division received a proposal from PacifiCorp to revise the Cottonwood/Wilberg mining and reclamation plan. Revisions to this amendment proposal were received April 12, 2001, November 9, 2001, and November 29, 2001, and April 30, 2002.

The amendment includes deleting part of the permit area, as leases have been relinquished. In a memo dated February 25, 2002, Paul Baker recommended approval of the legal and financial changes resulting from the reduction of the permit area. The Division must issue a new permit, because of the reduction in acreage.

Based on previous correspondence, it appears that other aspects of this amendment received approval for incorporation into the MRP. This was done in a letter dated March 1, 2000.

In a letter dated May 30, 2000, PacifiCorp indicated that a revision to Appendix VII, submitted with the revised mining and reclamation plan amendment, had not received Division attention. The revision was located in DOGM files as part of amendment AM00A. The revised Appendix VII contains details of operations and performance during reclamation of the Old Waste Rock Site (UTU-37642). Attachment F of this revision presents soil analyses that reveal reduced soil salinity in the reclaimed cells of the waste rock site. Attachment C of this revision quantifies growth of the plant communities in the cells of the waste rock site.

Appendix VII was reviewed by Priscilla Burton on July 14, 2000 and found to have eliminated critical soils information which should not be deleted from the MRP. In addition, the revision had transcription errors that needed verification before gaining approval from the Division. Some errors were corrected with the November 2001 as noted by Paul Baker in his February 25, 2002 review.

Energy West Mining, Inc had requested Phase I bond release for the Old Cottonwood/Wilberg waste rock site on December 17, 1998. The Division's Phase I Bond Release Decision Document is dated June 14, 1999, with recommendation for approval. The Office of Surface Mining concurred with the Phase I Bond Release approval on July 21, 1999.

The latest submittal in combination with the discussion found in the Division's Decision Document addresses the issues noted by Priscilla Burton on July 14, 2002.

TECHNICAL ANAYLSIS:

OPERATION PLAN

SPOIL AND WASTE MATERIALS

Regulatory Reference: 30 CFR Sec. 701.5, 784.19, 784.25, 817.71, 817.72, 817.73, 817.74, 817.81, 817.83, 817.84, 817.87, 817.89; R645-100-200, -301-210, -301-211, -301-212, -301-412, -301-512, -301-513, -301-514, -301-521, -301-526, -301-528, -301-535, -301-536, -301-542, -301-553, -301-745, -301-746, -301-747.

Analysis:

Refuse piles

In a previous review dated July 14, 2002, the Division noted that although the text on page 5 of revised App VII indicates that the waste was covered with 3.4 feet of soil cover, the soil sampling information in the MRP indicates otherwise. For example:

1. Cell 2 was seeded in 1984. Samples taken from Cell 2 in 1989 (ACZ Laboratories, Inc.) indicate that coal was encountered at one to two feet, suggesting that there was cover over the waste to a depth of less than two feet.

2. Cell 4 was seeded in 1986. 1989 analyses from ACZ again indicate that coal was encountered at one to two feet in cell 4.

The question of the average depth of cover at the site was raised during review of the Phase I Bond Release application (Decision Document is dated June 14, 1999). The average soil cover depth of 3.3 feet was calculated at that time, based upon total cover volume of 79,851 cubic yards and an area of 15 acres. As reported by the Division in the Decision document, in 1999, a core was drilled in Cell 7 the depth of the core was approximately 3 feet to the waste rock, which was consistent with the average depth of the calculated depth of cover. The location of the core is found on the map in Appendix C dated March 5, 1999.

Salinity and sodicity are of concern at the waste rock site. The data from Table II and Table III of App VII (dated 8/22/89) describes waste rock material in Cell 2 that is sandy loam in texture, high in carbon, and has high EC and extremely high SAR values. (Some of the data presented are combined means from 1986 and 1989 sampling.) In 1986/9, Cells 5 and 6 also had high SAR values, although not to the extreme of Cell 2. Further data from 1989 indicate that the material is low in carbonates and high in chloride salts. Elevated boron levels were recorded at locations 4-A-2 and 5-C-4.

App. VII reveals two major trouble spots in Cell 5 as well: 5-C and 5-D both of which are saline/sodic throughout all depths. It was noted in Attachment C, "Comparison of Vegetation Data of Selective Reclaimed Cells at the Cottonwood Old Waste Rock Site, 1997," that there were "'patchy' areas (approximately 10 - 15% of the cell [5] area) where only weedy species appeared to be growing." The consultant (Patrick Collins) surmised that these areas may have soil problems. These areas are not shown on Figure 2 of App. VII, but they may correspond with sites 5-C and 5-D noted above to be saline/sodic at all depths.

The location of all sampling must be provided as required by R645-301-131. Information on the sampling location was requested in the last technical review of this application. The Permittee notes that it would be impossible to locate the Cell 2 Problem Area and the Cell 5 "patchy areas" as described in Appendix C, as the report was completed in 1997. Since Phase I Bond Release was approved on this site and the report was reviewed without deficiency at that time, the Division will not pursue the omission of this information.

There has been nine years of growth in Cell 2, and this area has about 50% vegetative cover. According to Attachment C, most of that cover is crested wheatgrass (*Agropyron cristatum*). One-third of the cover is fourwing saltbush (*Atriplex canescens*). The consultant (Patrick Collins) mentions that "the differences between the two areas [Cell 2 and Cell 2 problem area] were much less than the previous years." The location of the problem area was not noted on Figure 2 of App. VII, so it is difficult to know how the soils data of Attachment F corresponds to the vegetation data of Attachment C.

Over time, leaching of the salts has occurred from the soils, as discussed in the narrative, pages five through nine of Appendix VII. Attachment F of the amendment presents a comparison of data collected in 1986 and 1994 from Cells 2, 4, and 5 to show that pockets of

salinity have decreased over time through leaching. Data was analyzed in 1986 by NPI Soil Testing Laboratory, Salt Lake City and in 1994 by InterMountain Laboratories, Sheridan Wyoming. Levels of all ions (Ca^{++}, Mg^{++}, Na^{+}, Cl^{-}) decreased in 1994 from 1986 values. Where there were extreme EC and SAR values, salt levels are now manageable for the vegetation seeded and land use plans.

In 1994, soil tests revealed elevated sodium below one foot at sites 2-G and 2-H in Cell 2. The 1994 Vegetation Monitoring Annual Report also mentions these sites as problem areas where large saltbushes are dying back and where halogeton is dominant. It is expected that these salts will also leach through time.

Also measured were the establishment of plants in Cells 4 and 5. These cells have only 3 years of growth for comparison. At this stage of reclamation, vegetative cover is 47% for Cell 4 and 57% for Cell 5. In both cases, the bulk of the cover is from grasses, particularly western wheatgrass (*Elymus smithii*) and crested wheatgrass (*Agropyron cristatum*) for Cell 4 and needle-and-thread grass (*Stipa comata*) and crested wheatgrass for Cell 5. Shrub growth is improving.

Although the Division has approved less than four feet of cover over the refuse (R645-301-553.252), this amendment omits the supporting original laboratory data from Attachment F of Appendix VII. However, the Permittee has agreed to include the 1986, 1989 and 1994 sampling information in Attachment F.

Findings:

Inclusion of the original laboratory data for 1986, 1989 and 1994 in Attachment F of Appendix VII, should be retained in Attachment F of Appendix VII to support less than four feet of cover over the refuse. Information in the application meets the minimum acceptable requirements of the regulations for approval, based upon the receipt of the original laboratory data for 1986, 1989 and 1994.

RECOMMENDATIONS:

The Permittee has agreed to included in Attachment F of Appendix VII the original data sheets from the 1986, 1989, and 1994 analysis. Conditional approval is therefore recommended.