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June 4, 1999

TO: File

THRU: Joe Helfrich, Permit Supervisor

FROM: James D. Smith, Reclamation Specialist JDS

RE: Chapter 9 Revision - Response to April 5 TA, PacifiCorp, Des Bee Dove Mine, ACT/015/017, Deer Creek Mine, ACT/015/018, and Cottonwood Mine, ACT/015/019 (98C), File #2, Emery County, Utah

SUMMARY

Energy West submitted a revised version of Chapter 9 of the Des Bee Dove, Deer Creek, and Cottonwood Mines MRP on November 10, 1998 (received at UDOGM November 12). A Technical Analysis dated April 5, 1999 was prepared by the Division and sent to PacifiCorp. PacifiCorp's response was received by the Division on May 3, 1999. This (June 1999) TA addresses only the information that was submitted in May in response to the April TA. Redline - strikeout markings have been removed from the Chapter 9 text in the May submittal so pagination references in this TA do not match those in the April TA.

Appendix A included with this submittal contains the same information on changes to the monitoring of Mill Fork and Rilda Canyon as the Appendix A that was approved for insertion into the permit in January 1999.

RECOMMENDATION

Previous deficiencies have been adequately resolved and no additional deficiencies have been identified. The revised Chapter 9 can replace the current Chapter 9 in the MRP.

TECHNICAL ANALYSIS

ENVIRONMENTAL RESOURCE INFORMATION

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

HYDROLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 701.5, 784.14; R645-100-200, -301-724.

Analysis:

Baseline information.

The revision of Chapter 9 contains no changes to the hydrologic monitoring program, although it does contain additional information on previously approved changes to monitoring in Rilda and Mill Fork Canyons. Monitoring data collected by Beaver Creek Coal Company - No. 4 Mine and by the USGS (site No. 86 - Open File Report) have been incorporated into PacifiCorp's hydrologic database (p.112), but there is no discussion of the data in the revised Chapter 9. Operational water quality monitoring was conducted in Mill Fork Canyon during 1997 and 1998. In accordance with the Hydrologic Monitoring Plan, baseline water quality analysis was initiated in the fourth quarter 1998 and will continue until the fourth quarter 2000, and after that baseline analyses will be performed every 5 years (p.112 and Appendix A).

Resistivity - Induced Polarization (IP) surveys were conducted in Rilda (1989 and 1992), Mill Fork (1989), and Cottonwood (1992) Canyons and across the Left Fork Fault Zone (year unknown). Locations are shown on HM-7. The report by Geo-Western on the 1989 Rilda Canyon and Mill Fork resistivity survey (lines R-1 to R-6) is in Hydrologic Support Information 4 in the revised Chapter 9. Elevation profiles (Drawing GENS1338D) and pseudo sections of lines R-7, R-8, and R-9 for the 1992 Rilda Canyon resistivity survey are in Hydrologic Support Information 9.

There is no information in the MRP on the Left Fork Fault Zone survey other than the line locations shown on HM-7. In the cover letter sent with the May 3 submittal it is explained that the Left Fork survey was for mine planning purposes and not part of a hydrologic investigation. The graben does not control hydrology where it was intercepted in the mine but it did limit reserves due to roof control problems.

Ground-water information.

Ground water in the Roans Canyon fault is described on pages 57 through 59. The Roans

Canyon fault was first encountered in 1985, and again in 1988, in a series of horizontal borings intended to evaluate the porosity of the fault system and the potential for dewatering the system before mining operations encountered and crossed the fault. The conclusion from these tests appears to be that there is "limited lateral communication along the fault". The mean residence time of the water apparently was not determined at the time it was first encountered in these borings. Reports on the borings and related hydrogeologic analyses were prepared by Williams and Associates for the 1985 investigation and by Hydro-Search, Inc. for the 1988 - 1989 investigation: these two reports are in Hydrologic Support Information 1.

The Roans Canyon fault was encountered at the 3rd North 1st and 2nd Right entries in 1990. Peak discharge from the fault zone was 5,000 gpm, but flow had decreased to 150 gpm at the last measurement of water from this area in 1991. Mean residence time of this water was not determined.

Ground water levels in Rilda canyon are discussed on pages 99 through 101, with reference made to Figure HF-25 for water depth information from piezometers P-1 through P-7. P-2 and P-3 were offset and replaced by P-6 and P-7 in 1990 (p. 87) and Figure H-25 shows water depth information for wells EM-47, P-1, P-2, P-3, P-4, P-5, P-6, and P-7 from 1986 through 1998.

Probable hydrologic consequences determination.

The 1994 Environmental Monitoring Summary by Ecosystem Research Institute (Hydrologic Support Information 3) has replaced the 1990 Ecosystem Research Institute report and Technical Memorandum that was previously in the MRP. The even-numbered pages of this report in the November 1998 submittal were copied off-center and as a result text and numbers were clipped along the right edge and holes for the three-ring binder obliterated some data. PacifiCorp sent a totally legible copy of the report with the April submittal.

Surface-water monitoring plan.

Monitoring in Mill Fork Canyon was initiated in 1997 and is discussed on pages 111 and 112 and in Appendix A. The monitoring points in Mill Fork Canyon are identified on maps HM-1 and HM-4. Operational water quality monitoring was conducted in Mill Fork Canyon during 1997 and 1998. In accordance with the Hydrologic Monitoring Plan, baseline water quality analysis was initiated in the fourth quarter 1998 and will continue until the fourth quarter 2000. After that, operational monitoring will be performed with baseline analyses performed every 5 years (p. 112 and Appendix A).

Appendix A (page 9, note to RCF1) and map HM-1 have been updated to include the monitoring point adjacent to EM-163 in upper Rilda Canyon. During mining of the North Rilda Leases, flow will be measured yearly during base flow conditions (p. 110).

Findings:

Information in the hydrologic resource section is considered adequate to meet the requirements of this section.

MAPS, PLANS, AND CROSS SECTIONS OF RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 783.24, 783.25; R645-301-323, -301-411, -301-521, -301-622, -301-722, -301-731.

Analysis:

Coal Resource and Geologic Information Maps.

The relationship between Little Bear Spring and Mill Fork graben is clearly shown on Drawing CE-10844-EM, which is to be removed from the MRP. HM-6, which is a reproduction of a USGS map, shows the location of Little Bear spring but does not show the faults or graben. Most information concerning geology and springs that is shown on Drawing CE-10844-EM is now on maps HM-1, HM-4, and HM-7; however, of these three maps only HM-7 shows the location of Little Bear spring and it's relationship to the graben identified in the Huntington #4 Mine (Mill Fork graben).

Monitoring Sampling Location Maps.

Map HM-1 shows locations of springs, streams, wells and piezometers, and flumes, and HM-8 shows these items in more detail in the area around the Rilda Canyon spring-water collection system. Several other maps also show some of these features. P2 and P3, which are referred to several places in the text, were shallow piezometers that are not on most maps because they were replaced in 1990 by deeper offsetting piezometers P6 and P7.

Monitoring in Mill Fork Canyon was initiated in 1997. Monitoring of Mill Fork is discussed on pages 111 and 112 and in Appendix A. Locations of the monitoring points in Mill Fork Canyon, MFA01 and MFB02, are on maps HM-1 and HM-4.

The Roans Canyon fault was encountered in 1985 and again in 1989 in a series of horizontal borings. The location of these borings is shown on maps in the consultants reports in Hydrologic Support Information 1.

Certification.

In addition to HM-7, revised versions of HM-1, HM-2, HM-4, HM-5, HM-9, and HM-10 have been submitted. All these maps are certified by a qualified, registered professional engineer or land surveyor.

Findings:

Maps, plans, and cross sections of resource information are considered adequate to meet the requirements of this section.