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To: P/MC

July 9, 1993

TO: File

THROUGH: Daron Haddock, Permit Supervisor

FROM: James D. Smith, Reclamation Specialist JDS

RE: Technical Completeness Review
Mining and Reclamation Plan Submitted for Permit Renewal
Received May 13, 1993
Genwal Coal Company, Crandall Canyon Mine
ACT/015/032, Folder #2, Emery County, Utah

SUMMARY

Chapter 7 has been updated to include the areas of the two State leases and the right-of-way. This additional information has satisfied most of the deficiencies noted in the 31 March, 1993 Technical Review. Remaining deficiencies are discussed below. The most substantial remaining deficiency is the lack of analysis to determine the hydrogeology of Joes Valley and its relationship to the permit area.

7.22 Cross Sections, Maps, and Plans

Proposal:

1. Figures 7-1 through 7-14 and Plates 7-1 through 7-5 depict existing surface and ground water occurrences within and adjacent to the permit area. These maps also show the topography, streams, wells, water monitoring locations, and other hydrologic design information pertinent to the Crandall Canyon mine (page 7-2).

Analysis:

1a. The reference made here to Figures 7-1 through 7-14 is a hold over from the old plan. Specifically; ground water occurrences, springs, wells, and monitoring well locations are not on the referenced Figures and Plates. The text needs to be revised so that it refers to Figures and Plates in the current MRP.

1b. Plates 7-8 through 7-16 have been added to replace out-of-date or unreadable Figures from the old MRP and to add information on the Blind Canyon monitoring project.

1c. The potential impact of the mine operation on Little Bear spring has been added to the PHC with the new version of Appendix 7-15 submitted June 18, 1993.



1d. Plate 7-5a shows the headgate for UD-3 outside the disturbed area boundary. This has been checked on the ground and the headgate is actually inside the boundary, as it should be, and Plate 7-5a needs to be corrected to show this.

Deficiency:

- 1a. Figure and Plate numbers referenced in Section 7.22 need to be updated.
- 1b. Plates 7-12, 7-14, 7-15, and 7-16 do not show lease SL-062648 extending into Section 6.
- 1c. Plate 7-12 does not indicate the location of Little Bear spring.
- 1d. The headgate for UD-3 is shown as being outside the permit boundary on Plate 7-5a.

7.24 Baseline Information
7.24.1 Groundwater Information

Proposal:

1. Results of the seep and spring surveys (EarthFax Engineering, 1985a and 1985b) were submitted previously to DOGM (page 7-5).
2. Specific conductance, pH, temperature, and use and flow data for seeps and springs are given in Appendices 7-16 through 7-19 and discussed on pages 7-11 and 7-12.
3. SP-30 and SP-36 will be monitored to determine potential impacts in the immediate vicinity of the mine (page 7-30).

Analysis:

1. One seep and spring report from EarthFax, dated 21 November, 1985, has been located in the DOGM files. The other report may be there also but has not been located. Users of the MRP, especially non-DOGM users, are not given adequate information to identify and locate these reports.
2. Analysis of ground water for total iron and total manganese is required by R645-301-724.100 as part of the baseline data. Table 7-5, the list of parameters for Extended baseline analysis, includes Manganese and Dissolved Iron.

There are no copies of laboratory reports of analysis results for waters from seeps and springs in the MRP. Iron and manganese are not included in the summary tables in Appendices 7-16 through 7-19. Iron and manganese are not mentioned on pages 7-11 through 7-12.

3. According to Appendix 7-17, spring SP-30 has not had measurable flow since 1985. Annual Reports for 1990, 1991, and 1992 also show no flow for SP-30. SP-30 is being monitored to determine impacts in the immediate vicinity of the mine, yet there is no analysis of the loss of flow at SP-30 as it might relate to mining in lease SL 062648, even if that mining occurred prior to Genwal's operation of the mine.

Deficiency:

1. The EarthFax Engineering (1985a and 1985b) references are not listed in the References section.
2. Results of analyses of seep and spring waters for iron and manganese are not in the MRP as required by R645-301-724.100. nor is there an explanation for their absence.
3. The possible relationship between mining in lease SL 062648 and the cessation of flow from SP-30 has not been analyzed.

7.24.2 Surface Water Information

pages 7-14 through 7-23

Proposal:

1. Flow measurements collected at the U.S.G.S. gauging station at the mouth of Crandall Canyon, from a flume in Blind Creek, and estimated in Horse Creek are contained in Appendix 7-2 (page 7-17) and in Table 7-6a (page 7-35).
2. Blind Canyon is the location of a proposed study, which will be done by the USFS and partially financed by Genwal, of effects of retreat-mining induced subsidence on watershed erosion and stream flow (page 7-20). A timetable for the research and mining is in Appendix 7-26 and related information is in Appendices 7-27 through 7-39. Because subsidence induced increases of sediment load could impact USFS lands and waters outside the permit boundary, Genwal has committed to providing off-site mitigation on USFS lands to offset potential damage. In addition Genwal commits to remediating any adverse effects of retreat mining.
3. In anticipation of acquiring adjacent leases, a flume has been installed in Indian Creek (page 7-36). The location is shown on Plate 7-7.

Analysis:

1. Flow measurements from Crandall Canyon from October 1979 to September 1984 are in Appendix 7-2; however, flow measurements from the flume in Blind Canyon and estimated flows from Horse Canyon are not in Appendix 7-2 as stated on page 7-17. Table 7-6a is identified on page 7-35 as the location of these flow data; this table is not in the current version of the plan. The flow data from 1991 for the three canyons is now in Appendix 7-23. The flow data for September 1992 that was previously in Table 7-6a has not been included in this appendix.
2. The Blind Canyon study has the objectives of quantifying changes in stream channel profiles and changes in channel features, such as erosion. Methods outlined in the proposal in Appendix 7-25 involve establishing cross sections and stream profiles, surveying morphometric features, and assessing streambank stability and landslides. The study does not propose any water analyses.
3. Although the large majority of the surface of the permit area drains to Huntington Creek, the western portion of lease ML-21568 (Section 2) drains west into Joes Valley. There is a flume in Indian Creek but no flow data are presented in the MRP. There are no water quality or

quantity data from Indian Creek and the associated drainages on the west side of East Mountain and there is no plan given in the MRP to obtain any.

Deficiency:

- 1a. The MRP contains flow data for Horse Canyon and Blind Canyon only for the year 1991.
- 1b. References to Table 7-6a no longer apply.
2. There are no surface water quality data and there is no plan given in the MRP to evaluate or monitor surface water quality in Horse and Blind Canyons.
3. Indian Creek and associated drainages from the west side of East Mountain into Joes Valley are not included in the evaluation of surface water quality and quantity nor is there a plan to monitor these streams.

7.28 Probable Hydrologic Consequences Determination

Proposal:

1. The PHC is in Appendix 7-15. An updated version was submitted June 18, 1993 in response to the part of Division Order #93A concerning Little Bear Spring. No water inflow is occurring in the Crandall Canyon mine, consequently water is being pumped into the mine (page 1 Appendix 7-15).

Analysis:

1. Water inflow of approximately 100 gpm, mostly from the old workings, is described on page 7-13 of the MRP. (This water flow was also described and discussed at the June 10, 1993 meeting with Castle Valley Special Services District and Huntington Cleveland Irrigation Company.) This water is pumped to State Lease ML-21569 for use in the mining operations.

The latest version of Appendix 7-15 (June 16, 1993) indicates that all water for in-mine consumption is being pumped from Crandall Creek with no contribution from mine inflow. It stresses the low potential for impact to the regional Blackhawk-Starpoint aquifer. The previous version of the PHC stated that mine consumption had been met from inflow alone for the previous two year period, with no water needed from Crandall Creek, and that the use of in-mine flow reduced the potential for impacts to Crandall Creek. That earlier version of the PHC agrees with information from page 7-13 and from Genwal's presentation at the June 10 meeting as to the volume and utilization of inflow.

Deficiency:

1. The latest version of the PHC ignores the volume of ground water flowing into the mine and the value of utilizing that water to reduce the demand for surface water from Crandall Creek.

7.30 Operations Plan
7.31.21 Ground Water Monitoring Plan

Proposal:

1. Construction and completion of wells MW-1 and MW-2 are described on pages 7-31 and 7-34.
2. Ground water monitoring will include collection of water quality and quantity data from eight springs (page 7-30). SP 2-24, SP 2-9, and SP-47a were chosen because of the water rights (93-1406, 93-1404, and 93-1407) filed on them by the USFS. SP-30 and SP-36 will be monitored to determine potential impacts in the immediate vicinity of the mine. SP-58 will be monitored as an indicator of long term changes in ground water issuing from the Blackhawk Formation in an area that will not be affected by mining operations. SP-19 and SP-22 will be monitored as indications of the water supply in the upper reaches of Blind Canyon.

Ground water rights are listed in Appendix 7-43 and shown on Plate 7-14. Seep and spring locations are on Plate 7-12. Tables 7-4 and 7-5 list the parameters for which baseline and operational monitoring are done. Ground water quality and quantity information is in Appendices 7-16 through 7-20.

Analysis:

1. Wells MW-3, MW-4, and MW-5 are not mentioned. Information on construction and completion of these three wells should either be added or reference made to where information can be found.
2. According to Appendix 7-17, spring SP-30 has not had measurable flow since 1985. Annual Reports for 1990, 1991, and 1992 also show no flow for SP-30. SP-30 is being monitored to determine impacts in the immediate vicinity of the mine, yet there is no analysis of the loss of flow at SP-30 as it might relate to mining in lease SL 062648, even if that mining occurred prior to Genwal's operation of the mine. Continued monitoring of an apparently dry spring is of little value; consideration should be given to other springs in lease SL-062648 to be monitored in addition to or as replacements of SP-30.

Water rights have been claimed by the USFS on lands surrounding the permit area, with numerous claims on springs in Upper Joes Valley, immediately west of the permit area. At least part of the water discharged by the Joes Valley springs has been characterized as coming from East Mountain (page 7-6). The USFS also holds surface water rights within and adjacent to the state leases. The USFS has expressed concern that the monitoring plan is not adequate to characterize the ground water system or to monitor effects of mining on water resources contributing to surface and ground water flow on Forest Service lands

There is no commitment for continued operational monitoring of any springs within lease ML-21568 or in Joes Valley. The only spring selected for operational monitoring in the state leases is SP 1-19, an intermittent spring at the edge of the area of potential subsidence for lease ML-21569 (Sec 36). SP 1-9 in lease ML-21568 and SP 1-24 in lease ML-21569 are perennial springs that would be good candidates for monitoring as they are in areas most likely to experience maximum subsidence,. There are no water rights filed on any seeps and springs within the state leases, but impacts to these springs could affect surface water in the Crandall and Blind Canyon drainages. In addition, use of these seeps and springs by

wildlife could be greatly affected.

A commitment is made on page 7-14 and again on page 7-28 that when flows are interrupted or reduced (by 50% or more) as a result of mining activities, alternate water supplies will be developed. While monitoring of every spring and seep is not practical, there must be enough monitoring to detect impacts from mining, otherwise the commitment to mitigate is meaningless.

SP-19 and SP-22 referred to on page 7-30 are labeled SP 1-19 and SP 1-22 on Plate 7-12. On Plate 7-12 and in Appendices 7-16 through 7-20 there are springs identified as SP 19, SP 1-19, and 2-19; and SP-22, SP 1-22, and SP 2-22.

Deficiency:

1. There is no information on the construction or completion of wells MW-3, MW-4, and MW-5 in this section.
- 2a. Monitoring a flowing spring in addition to or ⁱⁿ place of SP-30 should be considered.
- 2b. Additional intermittent and perennial springs, within the state leases in areas likely to be affected by subsidence and in Joes Valley, are needed in the operational monitoring plan.
- 2c. Names or labels for monitored springs SP 1-19 and SP 1-22 need to be consistent throughout the MRP.