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TO: Internal File

THRU: Sharon Falvey, Team Lead *SFF*

FROM: James D. Smith, Reclamation Specialist *JDS*

RE: Technical Analysis of the Wild Horse Ridge Amendment, Co-op Mining Company, Bear Canyon Mine, ACT/015/025 - SR98(1) - 2

SUMMARY:

The proposed Wild Horse Ridge amendment to the Bear Canyon Mine MRP was received by the Division on 28 September, 1999. This significant revision is for the addition of Federal Leases U-020668 and U-38727 and fee coal owned by C.O.P. Development to the permit area. A letter was sent to the Permittee November 16, 1999 indicating the Division had determined the amendment to be Administratively Complete.

TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

GEOLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 784.22; R645-301-623, -301-724.

Analysis:

Changes to the text, mostly minor, have been made on pages 6-3, 6-6, 6-10, 6-11, 6-13, 6-16, 6-18, and 6-19 of Chapter 6. The proposed permit boundary as shown on revised Plates 6-1 through 6-12 includes federal leases U-020668 and U-38727 and fee coal owned by C.O.P. Development. Plate 6-1 is the Geology Map. Plates 6-2, 6-6, and 6-10 are overburden maps, Plates 6-3, 6-7, and 6-11 are isopach thickness maps, Plates 6-4, 6-8, 6-12 are structure contour maps, and Plates 6-5 and 6-9 are interseam isopach maps.

Drill-hole DH-3 was abandoned in 1993 and replaced by DH-4. Drill-hole logs and well completion diagrams for DH-4 are stated (p. 6-13) to be in Appendix 6-A, but they are in Appendix 7N-G rather than Appendix 6-A.

The well completion diagram for MW91-14 (MW-114?) has been submitted for inclusion in Appendix 7-A. The location of this well is not shown on the maps in Chapter 6.

Plate 7-9 in the current MRP is a stratigraphic cross-section, and the locations of the bore-holes are supposed to be found on Plate 6-2; however, Plate 6-2 does not show the locations for bore-holes M91-16 and M91-17.

Plates 6-2 through 6-12 show various stratigraphic thicknesses or depths based on information from numerous drill-holes; however, neither the current MRP nor the proposed amendment contain logs for bore-holes WHR-1, WHR-2, WHR-3, WHR-5, WHR-8, F-76-1, F-77-5, F-76-6, 77-3A, and F-77-11-A. The source of the depth and thickness values associated with these bore-holes on the maps is not described or explained. There is no hydrology information available for the "WHR" series of bore-holes (p. 7-20).

The current MRP includes a description of the areal and structural geology of the proposed permit and adjacent areas, including federal leases U-020668 and U-38727 and fee coal tract owned by C.O.P. Development. The description is based on maps and plans required as resource information for the plan, detailed site specific information, and geologic literature and practices. Additional geologic information has been submitted as part of Appendix 7J-I, Investigation of Groundwater and Surface Water Systems and Probable Hydrologic Consequences, a report by Mayo and Associates, LC. These descriptions show how areal and structural geology may affect the occurrence, availability, movement, quantity, and quality of potentially impacted surface and ground water.

Coal isopach thickness maps indicate the Blind Canyon and Tank seams, but not the Hiawatha seam, are of minable thickness in portions of the Wild Horse Ridge area. The Hiawatha seam was previously thought to be continuous and of minable thickness, but recent drilling has revealed several sandstone channels that render the seam unminable in the vicinity of Bear and Fish Creeks (pp. 6-18 and 6-19 and Plate 6-7) and this seam is described as not minable in Table 3C-1. Revised Plates 3-4A and 3-4C show projected mining in the Blind Canyon and Tank seams, respectively, in the Wild Horse Ridge addition.

Subsidence is discussed in Appendix 3-C. Total calculated subsidence in the Wild Horse Ridge area is 7.3 feet, based on an average total thickness of 16.5 feet for the Tank and Blind Canyon seams: in the existing permit area, the calculated maximum subsidence is 14.1 feet based on an average total thickness of 22 feet for the Tank, Hiawatha, and Blind Canyon seams (Table 3C-1). Average thickness of the Blind Canyon seam is 9 feet and average depth is 1,200 feet, and for the Tank seam the averages are 7.5 feet thick and 950 feet deep.

Except as noted below, the application includes geologic information in sufficient detail to assist in determining the probable hydrologic consequences of the operation upon the quality and quantity of surface and ground water in the permit and adjacent areas, including the extent to which surface and ground water monitoring is necessary, and determining whether reclamation as required by the Utah Coal Mining Rules can be accomplished and whether the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area.

At this time the Division does not require the collection, analysis, and description of additional geologic information to protect the hydrologic balance, to minimize or prevent subsidence, or to meet the performance standards. The Permittee has made no request to the Division to waive in whole or in part the requirements of the bore hole information or analysis required of this section.

Findings:

Information on geologic resources is not considered adequate to meet the requirements of this section. Prior to approval the Permittee must provide the following in accordance with:

R645-301-121.200 - It states on page 6-13 that drill-hole logs and well completion diagrams for DH-4 are in Appendix 6-A, but they are in Appendix 7N-G.

R645-301-121.200, -624 - It states on page 7-54 that well completion diagrams for MW-115, and MW-116 are in Appendix 7-A, but the diagrams are not there. The diagram for MW-114 is apparently there, but labeled MW91-14.

R645-301-121.200, -622, -624 - In places in the proposed amendment, Plate 7J-2, Plate 7-9, and page 7-6 for example, some bore-holes have different names. MW-116 appears to be the same as M91-16, MW-117 the same as M91-17, and MW-114 the same as M91-14.

R645-301-622 - It states on Plate 7-9 states that locations of the bore-holes that were used in constructing the cross section are shown on Plate 6-2; however, the locations for bore-holes MW 116 (M91-16) and MW 117 (M91-17) are not on Plate 6-2 or on any other map.

R645-301-622.210 - MW-114 (M91-14 in Appendix 7-A?) is discussed in the text, but the location is not shown on a map.

R645-301-624.210 - There are no logs in either the current MRP or the proposed amendment for drill-holes WHR-1, WHR-2, WHR-3, WHR-5, WHR-8, F-76-1, F-76-2A, 77-3B, F-76-4, F-77-5, F-76-6, and F-77-11-A. These bore-holes are in or adjacent to the Wild Horse Ridge addition, and the source of the thickness and

depth information from these bore-holes that was used in making Plates 6-2 through 6-12 is not described or explained. There are no cross-sections showing this information for these bore-holes.

R645-301-624.210 - It states on page 7-34 that completion diagrams for SDH-1, SDH-2, and SDH-3 are in Appendix 7-A, but they are not there.

R645-301-121.200, -624.210 - The relationship between the "DH" and "SDH" bore-holes is unclear and confusing. It states on page 7-34 that a discussion of baseline data for the "SDH" borings is in Appendices 7-J and 7-N, but 7-N covers the "DH" borings only.

HYDROLOGIC RESOURCE INFORMATION

Regulatory Reference: 30 CFR Sec. 701.5, 784.14; R645-100-200, -301-720.

Findings:

The hydrologic resource information provided in the PAP is not considered adequate to meet the requirements of this section. Prior to approval the Permittee must provide the following in accordance with:

R645-301-724 - It states on page 7-34 that baseline water levels for MW-114, MW-115, and MW-116 are in Appendix 7-M, but no ground-water information for these bore-holes could be found anywhere in the current MRP or the proposed amendment.

R645-301-121.200, -724.200 - On page 7-50 a tributary is described as "intermittent and ephemeral": this is unclear and confusing.

R645-301-121.200, -724 - Instead of deleting SBC-6 from the table on page 7-29, SBC-6 should remain in the table with an explanatory note as to why it is no longer monitored.

RECOMMENDATION:

Prior to approval, the Permittee must meet the requirements of R645-301-121.200, R645-301-622, R645-301-624, and R645-301-724 as outlined above.