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State of Utah
DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

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May 30, 1997

TO: File

THRU: Daron Haddock, Permit Supervisor *DH*

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

RE: Tank Seam Amendment, Co-Op Mining Company, Bear Canyon Mine,
ACT/015/025 97-1, File 2, Emery County, Utah.

SUMMARY

The only change to the text in Chapter 6 - Geology in the proposed Tank Seam amendment is removal of the "Upper Beds" from the list of coal beds in Table 6-2. All plates for Chapter 6 have been updated with information from additional drill holes. However, information on drill-holes and wells is lacking, most importantly driller's logs and lithologic logs. What was previously referred to as the Bear Canyon coal seam is now referred to fairly consistently throughout the text and on maps as the Blind Canyon coal seam.

Two water monitoring locations have been added to Plate 7-4, but locations for several baseline or other historical monitoring stations are lacking.

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.

PERMIT AREA

Regulatory Requirements: 30 CFR Sec. 783.12; R645-301-521.

GEOLOGIC RESOURCE INFORMATION

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

Analysis:

The current MRP includes geologic information 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. The only change to the text in Chapter 6 - Geology in the proposed Tank Seam amendment is removal of the "Upper Beds" from the list of coal beds in Table 6-2 on page 6-17. What was previously referred to as the Bear Canyon coal seam is now referred to fairly consistently throughout the text and on maps as the Blind Canyon coal seam.

All plates for Chapter 6 have been updated with information from additional drill holes. But logs from drill-holes SDH-1, SDH-2, and SDH-3 are not in the current MRP nor in the proposed Tank Seam amendment. Logs showing the lithologic characteristics, including physical properties and thickness of each stratum, and location of ground water where occurring should be in the MRP.

Figures 7.1-2 through 7.1-5 are being removed from the plan. The first three give generalized stratigraphic information and the fourth is detailed stratigraphic information based on interpretation of a geophysical well-log from bore-hole T-5. The reason for removing these four figures is not given and there are no equivalent plans or cross-sections submitted to replace them.

Water levels for Los Angeles Department of Water and Power (LADWP) wells MW-116 and MW-117 are discussed in the proposed Tank Seam amendment; however, there is no information on these wells other than their location, shown on Plate 7-4. The Tank Seam amendment should include information on drilling and completion of these two wells, such as: drilling methods, construction materials, completion methods, depths, and lithology or stratigraphy of the screened or open zone, so it can be evaluated as part of the Technical Assessment (TA) of the proposed Tank Seam amendment and used in preparing the Cumulative Hydrologic Impact Assessment (CHIA). If available, logs for these two wells that show lithologic characteristics and location of ground water should be in the MRP.

Information on twelve in-mine drill holes that was previously in Table 7.1-5 has been removed. Water quality data from at least one of those twelve holes, WM-C, is included in Table 7.1-1. Locations for the twelve drill-holes are not on either current or newly submitted maps. Locations and lithology and ground water information from these bore-holes should be in the MRP, including logs if they are available.

Information on eight additional and apparently newer in-mine drill holes has been added to Table 7.1-5. Locations of five of the eight new in-mine drill holes are on Plates 6-2 through 6-12, but locations of TS-12, TS-13, and TS-14 are not shown. There is no other information on the eight drill-holes.

Bore-holes T-1, T-2, T-4, and T-5 are shown on Plate 6-2 and several other maps. A stratigraphic section based on interpretation of a geophysical log from T-5 is Figure 7.1-5 in the current MRP, but that figure has been removed from the proposed Tank Seam amendment. Other than locations and isopach and coal seam elevation values on Plate 6-2 through 6-12, there is no information on these bore-holes in the Tank Seam amendment. The Tank Seam amendment should include information on these four drill-holes that can be evaluated as part of the TA of the proposed Tank Seam amendment and used in preparing the CHIA. Logs showing the lithologic characteristics and location of ground water where occurring should be in the MRP.

Plates 6-2 through 6-12 also show locations for WHR-1, WHR-2, WHR-3, WHR-5, and WHR-8. These five drill-holes are outside the proposed permit areas but fall within the adjacent area and within the Cumulative Impact Area (CIA). The Tank Seam amendment should include information on these five drill-holes that can be evaluated as part of the TA of the proposed Tank Seam amendment and used in preparing the CHIA. Logs showing the lithologic characteristics and location of ground water where occurring should be in the MRP.

There is no new information on potentially acid- or toxic-forming strata. Mining proposed in the area covered by the Tank Seam amendment should not require a change to the current reclamation plan. Plates 6-2 through 6-12 have been updated and the information can be used to upgrade the subsidence control plan, if necessary.

On page 7-13, Table 2-4 of Appendix 7-J is referred to as a generalized stratigraphic section. Table 2-4 of Appendix 7-J is a table of observation well water-level measurements, not a generalized stratigraphic section.

Page 7-2 refers to Appendix 7-H for detailed hydrologic evaluation of the Starpoint aquifers. The same appendix is referred to on page 7-3 for information on control of ground water movement by faults and dip of the strata. There is no hydrologic evaluation of the Starpoint aquifers or information on faults and dip and their control on ground water in Appendix 7-H, which instead deals with design of reclamation channels. The location of the hydrologic evaluation of the Starpoint aquifers or information on faults and dip and their control on ground water is not known.

Findings:

Information provided in the proposed Tank Seam amendment is considered not adequate to meet the requirements of the Geologic Resources section. Prior to approval of the amendment the permittee must provide the following in accordance with:

R645-301-624.200, -624.210, -724.300, -725, Logs from drill-holes SDH-1, SDH-2, and SDH-3 are not in the current MRP nor in the proposed Tank Seam amendment. Logs showing the lithologic characteristics, including physical properties and thickness of each stratum, and location of ground water where occurring should be in the MRP, so it can be evaluated as part of the Technical Assessment (TA) of the proposed Tank Seam amendment and used in preparing the Cumulative Hydrologic Impact Assessment (CHIA)..

R645-301-624.200, -724.300, -725, There is no information on wells MW-116 and MW-117, other than their location shown on Plate 7-4. The Tank Seam amendment should include information on drilling and completion of these two wells, such as: drilling methods, construction materials, completion methods, depths, and lithology or stratigraphy of the screened or open zone.

R645-301-624.200, -624.210, -724.300, -725, If available, logs for wells MW-116 and MW-117 that show lithologic characteristics and location of ground water should be in the MRP.

R645-301-121.200, -622.100, -624.200, -724.300, What little information there was in Table 7.1-5 concerning twelve in-mine drill holes has been removed from the proposed Tank Seam amendment. Locations for the twelve drill-holes are not on either current or newly submitted maps. Locations and lithology and ground water information from these bore-holes should be in the MRP, including logs if they are available.

R645-301-622.100, -624.200, -724.300, Eight apparently new in-mine drill holes have been added to Table 7.1-5. Locations of five of the eight drill holes are on Plates 6-2 through 6-12, but locations of TS-12, TS-13, and TS-14 are not shown. There is no other information on the eight drill-holes. Lithology and ground water information from these bore-holes should be in the MRP, including logs if they are available.

R645-301-624.200, -724.300, -725, There is no information on bore-holes T-1, T-2, T-4, and T-5 other than their location shown on Plate 7-4. Logs showing the lithologic characteristics and location of ground water where occurring in these bore-holes should be in the MRP.

R645-301-624.200, -724.300, -725, The Tank Seam amendment should include information on drill-holes WHR-1, WHR-2, WHR-3, WHR-5, and WHR-8 that can be evaluated as part of the TA of the proposed Tank Seam amendment and used in preparing the CHIA. Logs showing the lithologic characteristics and location of ground water where occurring should be in the MRP.

R645-301-121.200, -622, -624.100, Contrary to statements in the text of the proposed amendment, such as on pages 7-2 and 7-3, there is no hydrologic evaluation of the Starpoint aquifers or information on faults and dip and their control on ground water in Appendix 7-H, which instead deals with design of reclamation channels.

R645-301-121.200, -622, Contrary to the statement on page 7-13, Table 2-4 of Appendix 7-J is not a generalized stratigraphic section of the geologic units. There is no stratigraphic section in the proposed Tank Seam amendment submittal.

HYDROLOGIC RESOURCE INFORMATION

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

Analysis:

Baseline cumulative impact area information.

The current MRP and the proposed Tank Seam amendment contain geologic information to assess the probable cumulative hydrologic impacts of the proposed operation and all anticipated mining on surface- and ground-water systems for the cumulative impact area. Additional information is needed for drill-holes SDH-1, SDH-2, and SDH-3; wells MW-116 and MW-117; twelve in-mine drill-holes that were listed previously in Table 7.1-5; eight apparently new in-mine drill-holes that have been added to Table 7.1-5; drill-holes T-1, T-2, T-4, and T-5; drill-holes TS-6, TS-7, TS-8, TS-9, TS-10, TS-12, TS-13, and TS-14 (including locations for the

last three); and drill-holes WHR-1, WHR-2, WHR-3, WHR-5, and WHR-8. This has already been discussed in more detail under the Geologic Resource Information section above.

Modeling.

No modeling techniques, interpolation, or statistical techniques have been used in preparation of the proposed Tank Seam amendment.

Findings:

Information provided in the proposed Tank Seam amendment is considered not adequate to meet the requirements of the Hydrologic Resources section. Prior to approval of the amendment the permittee must provide the following in accordance with:

R645-301-624.200, -624.210, -724.300, -725, Additional information, specifically including but not limited to logs showing lithologic characteristics and locations of ground water where occurring, is needed for drill-holes SDH-1, SDH-2, and SDH-3; wells MW-116 and MW-117; twelve in-mine drill holes that were listed previously in Table 7.1-5; drill-holes TS-6, TS-7, TS-8, TS-9, TS-10, TS-12, TS-13, and TS-14 (including locations for the last three); drill-holes T-1, T-2, T-4, and T-5; and drill-holes WHR-1, WHR-2, WHR-3, WHR-5, and WHR-8.

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

Plates 6-2 through 6-12 show the nature, depth, and thickness of the coal seams to be mined, thickness of interburden, and thickness of overburden. Coal crop lines and the strike and dip of the coal to be mined within the proposed permit area are shown on these maps and other maps, including Plate 6-1.

Mine Workings Maps

A revised Plate 3-4C has been submitted in the proposed Tank Seam amendment to show location and extent of known workings of active, inactive, or abandoned underground mines in the Tank Seam. It also shows projected mining for the area covered by the proposed Tank Seam amendment. There are no mine openings to the surface within the proposed permit and adjacent areas from this seam.

Monitoring and Sampling Location Maps

Drill holes TS-12, TS-13, and TS-14 are listed in Table 7.1-5 but locations could not be found on submitted maps. Water sampling point WM-C and eleven other in-mine drill-holes are listed in Table 7.1-5 of the current MRP (these have been deleted from Table 7.1-5 in the proposed Tank Seam amendment) but could not be located on any submitted maps. Drill holes DH-1A, DH-2, DH-3, and DH-4 are listed in Table 7.1-4 and locations for three of the four bore-holes are on Plate 7-4, but the location of DH-3 is not on any submitted map.

Water monitoring points SBC-1, SBC-2, and SBC-3 are listed on page 7-38 but their locations could not be found on Plate 7-4.

Maps showing elevations and locations of monitoring stations used to gather data on fish and wildlife and air quality were not revised for the proposed Tank Seam amendment.

Permit Area Boundary Maps

Maps have been updated to show the expansion of the permit area into federal lease U-024316. The proposed amendment is for mining in the Tank Seam only.

Surface and Subsurface Ownership Maps

Coal ownership and mines in the permit and contiguous areas are shown on Plate 2-3. Surface ownership is shown on Plate 2-2.

Well Maps

There are no known oil or gas wells in the permit area.

Certification

Cross sections, maps, and plans included in this proposed Tank Seam amendment have been prepared by, or under the direction of, and certified by a qualified, registered, professional engineer.

Findings:

Information provided in the proposed Tank Seam amendment is considered not adequate to meet the requirements of the Maps, Plans, and Cross-Sections Resource Information section. Prior to approval of the amendment the permittee must provide the following in accordance with:

R645-301-622.100, Drill holes TS-12, TS-13, and TS-14 are listed in Table 7.1-5 but locations could not be found on submitted maps. Water sampling point WM-C and eleven other in-mine drill-holes are listed in Table 7.1-5 of the current MRP but could not be located on any submitted maps. The location of DH-3 is not on any submitted map. Water monitoring stations SBC-1, SBC-2, and SBC-3 could not be located on Plate 7-4.

CUMULATIVE HYDROLOGIC IMPACT ASSESSMENT

Regulatory Reference: 30 CFR Sec. 784.14; R645-301-730.

The Division has provided an assessment of the probable cumulative hydrologic impacts (CHIA) of the proposed operation and all anticipated mining upon surface and ground water systems in the cumulative impact area. The existing CHIA is sufficient to determine, for purposes of approval of the proposed Tank Seam amendment, that the proposed operation has been designed to prevent material damage to the hydrologic balance outside the permit area.

The Division is in the process of updating the CHIA for the entire Gentry Mountain area. Some deficiencies identified in this TA concern data that the mine should be able to provide to facilitate the CHIA determination.