



State of Utah

DEPARTMENT OF NATURAL RESOURCES
DIVISION OF OIL, GAS AND MINING

Norman H. Bangerter
Governor

Dee C. Hansen
Executive Director

Dianne R. Nielson, Ph.D.
Division Director

355 West North Temple
3 Triad Center, Suite 350
Salt Lake City, Utah 84180-1203
801-538-5340

June 15, 1992

TO: Daron Haddock, Permit Supervisor

FROM: Rick P. Summers, Hydrologist *RS*

RE: Review Castle Gate Area Reclamation Plan (received May 1, 1992 and May 5, 1992), Castle Gate Mine, AMAX Coal Co., ACT/007/004-92A, Carbon County, Utah

SUMMARY:

In accordance with Stipulation under Docket 91-001, AMAX Coal Company has submitted revised plans for the Castle Gate Area. These plans were received by the Division on May 1 and May 5, 1992.

Comments and completeness of the information within the text of this review is in regard only to those areas described in the Castle Gate Area. Determination of completeness of the response to the Division Order and Compliance of those requirements for approval cannot be made until such time that all of the required information has been submitted as required by the Division Order.

This review is specific to the Division Order #3 and #17 relative to the Castle Gate Area Reclamation designs and operational hydrology concerns. Hydrology issues involved in Division Order 21 regarding water monitoring are not addressed in this review. As per agreement with R. Allison (3/16/92, Division Offices), this issue will be addressed for the entire permit area upon completion of the response to the Division Order. Additionally, potential changes to the existing MRP material not related to reclamation plans and designs were not reviewed and cannot be considered to be approved amendments to the MRP.

Proposal:

The application proposes to utilize or modify existing sedimentation ponds during the reclamation period to treat the majority of the reclamation area drainage. Areas that cannot report tho these ponds due to topographic or drainage plan constraints will utilize alternative sediment control measures to provide for sediment control and drainage treatment. The discussion is presented in Chapter 3, Section 3.3, item 6). Drainage designs and plans are

included to restore the site drainage in Chapter 3, Section 3.4, Appendix 3.4L, and Chapter 7.

The Operator has presented designs for permanent channels based upon the 100 yr. - 6 hr. precipitation design event. Two culverts are proposed to be retained following bond release to provide for School House and Barn Canyon discharge under the adjacent railroad right of way. This culverts have been demonstrated to pass the 100 yr. - 6 hr. precipitation event.

The presentation does not include plans demonstrating that the proposed sediment control measures are designed, constructed and maintained using the best technology currently available to prevent, to the extent possible, additional contributions of sediment to stream flow or to runoff outside the permit area and minimize erosion to the extent possible. The plan should discuss and justify the concept that the "best technology currently available" is proposed with the alternative sediment control measures selected.

The application should present designs demonstrating that the sediment yields from the reclaimed area are minimized. Reference to other general reclamation plans in the MRP would be acceptable for the Castle Gate area alternative sediment controls. Locations of alternative controls structures should be depicted on an appropriate map as possible.

The use of the threshold of 5 fps for velocity to determine riprap protection must be justified. Soil/expected base material characterization should be used to determine the maximum permissible velocities for the channel materials and stability designs (refer to Barfield, Hann, 1981 for examples).

The MRP narrative needs to be revised to reflect the commitment and plan for development of the filter blanket for the reclamation channels. The Operator must commit to the collection of samples of material following excavation to grade for the channels for use in the design of the filter blanket. A general worst-case filter blanket design must be presented for calculation of filter blanket volumes and bonding estimates. That section needs to present general riprap specifications (depth, gradation, durability, etc.).

Analysis:

Division Order 3)

R614-301-140. Maps and Plans. The PERMITTEE shall submit to the DIVISION, a schedule for providing complete and accurate maps and drawings to depict the current existing conditions for all facilities, and, proposed reclamation treatments. This schedule shall be provided on or before March 1, 1991.

Division Order 17)

R614-301-550. Reclamation Design Criteria and Plans. The permit application must include site specific plans that incorporate the design criteria for reclamation activities. These design criteria and plans shall include but not be limited to: phased reclamation treatments and designs throughout the permit liability period, designs for temporary and permanent surface features, including diversions, impoundments, sediment control structures, and other facilities which will require construction throughout the reclamation process; specific plans and details for all permanent facilities to remain as part of or in conjunction with post mining land use, including roads, utilities, and structures; and, maps and drawings which clearly show the areal and vertical extent of the existing facility areas and those areas throughout all phases of reclamation. This information shall be provided on or before June 1, 1991.

The following review comments were itemized to facilitate Operator response to the Division's review. The comments are not identified as to the specific Division Order, but the content should make the intent obvious. The level of deficiencies in this submittal precluded a thorough technical analysis of the material. That analysis will be conducted following the Operator response to this review. The Operator is encouraged to contact me if additional clarification on these line items deficiencies is needed.

1. The operational map needs to depict the location of injection slurry/recovery wells, exploration holes, operational water lines (e.g. sewage, prep. circuit lines, culinary lines), and monitoring wells (e.g. piezometers on refuse pile). Exhibit 1.1 should depict water supply intakes downstream to Helper for the Price River. The reclamation map should depict the piezometers and any other monitoring wells that will be monitored during the reclamation period. These should be identified for removal upon termination of bond period. Reference rule R645-301-731.100
2. The permit area should include the underground area workings for the injection well facility.
3. Transfer and reclamation of wells. The MRP must include temporary and final sealing plans for all wells in the area. These plans are currently located in Section 3.10.
4. Exhibit 3:4.3 should be revised to define ASCA areas (shadow or boundary). Each ASCA area must be labeled and the narrative should discuss each ASCA in

terms of individual and cumulative area, runoff volume, treatment method(s), maintenance, installation (prior to reclamation redisturbance) and removal (upon meeting revegetation and water quality criteria, and bond release).

5. Plate 3.4.2A depicts an impoundment on top of refuse. This should be removed and the narrative and maps reflect the commitment to grade the refuse pile to ensure that water does not impound on the pile. The narrative should address and ensure compliance with R645-301-745.221, 746.212, and 746.222.
6. The inclusion of two narratives for the reclamation plan in Section 3.4 and Appendix 3.4L is confusing. The two sections should be incorporated into a single discussion with reference to calculations/appendix information as needed. The narrative used to discuss each phase for each structure should be consistent. For example, the ponds are referred to as "existing, existing-modified, reclamation, and reclamation-modified". The MRP should use specific language that defines period of use for each pond/structure design. The Operator should check the discussion in Section 3.4 and Appendix 3.4L. Suspect volume, design criteria conflicts may exist in two pond discussions.
7. On Plate 3.4.3, reclamation structures are described to be left "unless noted otherwise - U.N.O". The structures should all be identified by a specific identification label and the reference to U.N.O. changed to state specifically the period of intended use and removal for each structure. The reclamation narrative should include a discussion on the structures and the plate should be revised to depict the structure and period of use.
8. An error exists on Plate 3.4.3, culvert CGRC-2 is not depicted as continuing under the railroad/utility corridor right-of-way to the Price River.
9. The fate of drainage for reclamation channels that are currently shown terminating at railroad right-of-way needs to be addressed. The discharge from the permit area needs to be shown to be adequately dissipated and the direction of the drainage in the adjacent, existing drainage plan needs to be depicted.
10. Disturbed area and permit boundaries are inconsistent between several of the plates in the MRP. The boundaries should all be corrected to be consistent throughout the plan.

11. More narrative and reference to installation of the silt fencing is needed. Reference to a typical single-fence installation and fencing pattern (e.g. along contours) would be sufficient.
12. The plan views for Pond 12 (operational and reclamation) should depict the decant location (e.g. Exhibit 3.4.-9B and pg. 2 of 17 figure in Appendix 3.4L).
13. The Operator should check the drainages for CGRC-1, WS-U3, WS-U2 relative to drainage to Pond 12. It is not clear on the exhibit which drainages report to the pond. The diversion for CGWS-U3 appears to drain upslope.
14. The MRP needs to incorporate a design for diversions to route drainages to the ponds during the reclamation period. A single worst-case typical may be acceptable for all drainages. The berms to be used to direct the drainages should have a design.
15. The Operator needs to check that all operational diversions identified on the operational facilities map are accounted for in the reclamation plan. For example, diversions D6 , D1, and D7 are not reclaimed. The reclamation plate (3.4-3) also depicts (via contour information) several diversions that are not removed. These diversions have been identified on other plates as CFD-9, CGD-8, CGB-1, and CGB-2.
16. The operational facilities map needs to incorporate drainage control structures and delineate Alternative Sediment Control Areas. Current drainage maps do not incorporate the Unit Train Loadout area, the area from CGC-1 updrainage (raw water pond area), the truck scale area, the no. 3 belt line disturbance, and culvert CGC-4 is incorrectly depicted as continuing from the road to Pond 13 (Plate 3.4-2). That plate also depicts a diversion for CGWS-U5 that is not labelled. If that plate is to be used to comply with Division Order #3, it must delineate the disturbed area and permit area boundaries. The Operator must insure that the drainage labels used on the operational map correspond to design and text information in the MRP and that designs are included for all drainage structures used in the operational phase.
17. The MRP needs to be revised to account for the entire disturbed area in the vicinity of channel CGRD-5. The undisturbed portion of that drainage (barnhouse canyon) need a description of the increased flow from CGRD-8. A description of the flow depth and existing channel stability would be adequate for this reach.

18. The final disposition of culvert C-1 is unclear on the reclamation plate (3.4-3).
19. The MRP needs to address the no. 3 beltline area and structures reclamation plan. The removal of the structures and foundations and reclamation for the area needs to be addressed. The area needs to be referenced or depicted on Plate 3.4-3.
20. The Division suspects that some discrepancies exist between design volumes and details noted in the Section 3.4 narrative and the narrative in Appendix 3.4L. These may be due to the terminology used to identify the pond and period of intended use. The Operator is advised to edit these sections to ensure that all cited values are consistent and correct.
21. The MRP needs to incorporate a plan for the installation of filter blanket designs for reclamation channels (Appendix 3.4L).
22. The MRP needs to include or reference a sediment removal plan to be implemented during the reclamation phase. The plan should include: 1) stakes or survey to determine cleanout level, testing of the sediments, dewatering plan, and final disposal location.
23. The calculations in Appendix 3.4L need to verify and justify use of 5 fps velocity in the channel design for the existing/projected channel base materials.
24. The MRP contains redundant figures that could be eliminated and referenced (e.g. velocity against stone figures in Appendix 3.4L).
25. The Pond 13 calculations in the Appendix 3.4L need to identify contributory watersheds by a watershed identification label.
26. The Operator needs to ensure that all figures and calculation pages are labelled relative to the structure (e.g. stage-volume and stage-discharge curves for ponds should all be labelled as to the applicable pond and phase of use). The pages in Appendix 3.4L should be paginated or otherwise identified to facilitate written communication on the design work.
27. The plan for Pond 012-reclamation phase implies two inlets with only one design inlet presented in Appendix 3.4L. The Operator should clarify the design.

28. Riprap gradation curves needed for reclamation channels. The information can be referenced to other sections of the MRP if appropriate.
29. The Operator should define the Phase I drainage direction to the reclamation ponds more specifically on Map 3.4.3.
30. CGRD-10 is depicted as flowing uphill. Contour information is missing on Plate 3.4-3 for the embankment of Pond 013 that should be added to clarify the design.
31. In Appendix 3.4L, the summary page for contributing watersheds to diversions does not give information for CGRD-7, 8, and 10. The Operator should ensure these and all diversions are included in the summary.
32. The drainage for CGWS-9 needs to be addressed. The area is 29 acres with no designed drainage control for the 11 cfs from the area. Contrast this with CGWS-U1 with 20 acres and a designed channel (CGRD-1).
33. In reference to an unlabeled figure in Appendix 3.4L that partitions WS-U5 into subwatersheds 5a through d, the figure needs to be labelled and the extent of WS-5b is unclear as to the extent upslope to the undisturbed area to the east.
34. The reclamation timetable in Section 3.4.5 needs to be revised. Regarding removal of siltation ponds, the timetable states ponds will be removed "2 years after seeding". It should be revised to state removal will occur when revegetation and water quality criteria have been met, no sooner than 2 years following the last augmented seeding. The plan must also address regrading and reseeding requirements for the areas affected by pond removal.
35. There is a conflict in the text of the plan. Section 3.4.2 states that little contributory drainage exists to plant preparation ponds. This conflicts with the next page which states "drainage from haul road and associated affected area is run through either the refuse disposal or preparation plant pond system". This needs to be clarified. If disturbed area drainage reports to the process ponds, the area needs to be delineated and the ponds will need spillways as per impoundment and sedimentation pond rules (R645-301-742.220 and R645-301-743).
36. The cross-sections on Exhibits 3.4-9A and B needs to add the following elevations: 1) 10 yr. - 24 hr. runoff volume, and 2) maximum water elevation with spillway flowing at design head (25 yr. - 6 hr.).

37. Section 3.4-3(1)B should add a discussion defining period of use for "interim" and "final operational" stages to clarify period of use verses reclamation phases. Confusing is the definition of the interim stage as that "prepared to address the Division's more immediate concerns with drainage for the refuse pile". The section should be rewritten. The use of 5 fps for channel lining threshold should be justified in this section.
38. Section 3.4.31c needs a sediment removal plan including survey or stakes, dewatering, testing, and disposal area.
39. Section 3.4-4 discusses the reclamation plan but does not reference the information in other appendices (esp. Appendix 3.4L). The reclamation narratives should be consolidated and all other reclamation plans incorporated or referenced in that narrative as needed (e.g. unit train loadout and underground injection project).
40. An incorrect reference was found on page 15, Section 3.4.4 that refers to Exhibit 3.4.9 for grading topography. Exhibit 3.4.9a and b are sedimentation pond details. The same page also references Exhibit 3.4.9 for details for the sediment control measures for Phase I reclamation. These are details for sediment Ponds 11 and 12 and a typical silt fence detail.
41. Section 3.4.4 states "Phase I reclamation will also include removal of all roads and culverts, except as noted and establishment of permanent stream relocations." This section should specify the structures to be removed and to those to remain with specific identification labels. Post-mining land use requirements must be addressed for those structures that are to remain as permanent features.
42. The narrative in Section 6 of Section 3.4-4 states new silt fences may be installed if the sediment plug in old fence is stable. The plan should be revised to remove the silt fences from the site prior to bond release. Sediment wedges behind old fences should be contoured and seeded as necessary to conform to the reclamation topography.
43. Tables 3.4.1 (et. seq.) should be labeled as to appropriate phase of use (e.g. operational) and peak flows cited should give design storm return period and duration.

44. Table 3.4-4. appears to have errors when referenced to Map 3.4-2, dated 11/91. As an example only, no information is given for CGWS-d2E, CGWS-d3b, etc.
45. The narrative in Appendix 3.4L should be changed to clarify descriptions of ponds as "modified pond by D. Guy" and those modified for reclamation use.
46. Plate 3.4-3 should depict the water monitoring stations to be used during the bond period. These should include the existing stations, NPDES stations, piezometers and a new station at the inlet to each sediment pond.
47. The reclamation plan must address the acid-toxic material requirements in the backfilling and grading plan. The narrative should address rules R645-301-731.111, 121, R645-301-731.300, and R645-301-745.113.
48. The text states in Section 3.4-4 that Ponds 12A and 12 B will be retained during the reclamation period. This conflicts with the reclamation narrative and designs in Appendix 3.4L.

cc: R. Harden
D. Haddock
B. Richards
CGATEREC.RS