

TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

January 26, 2012

TO: Internal File

THRU: Steve Christensen, Permit Supervisor *SJC*

FROM: April A. Abate, Environmental Scientist III *AAA 2-29-2012*

RE: Alluvial Groundwater Management Plan, Alton Coal Development, Coal Hollow Mine, C/025/005, Task # 3998

SUMMARY:

The management of groundwater during the winter and wetter weather months has been problematic at this site. This application addresses a way to divert alluvial groundwater away from the mine pits and ultimately discharge the water to Lower Robinson Creek (LRC), an ephemeral channel that drains to Kanab Creek. This will minimize the volume of groundwater needing to be pumped from the mine pits into the sediment ponds.

The submittal addresses deficiencies outlined in a letter from the Division dated October 28, 2011. On January 17, 2012, Alton Coal Development (ACD), the Permittee submitted a response to a deficiency letter addressing an amendment for the management of alluvial groundwater upgradient of the mine pits deficiency letter dated: December 21, 2011 (Task 3991). The deficiencies herein demonstrate the need for additional engineering design details for the temporary impoundment to be included in the application prior to granting approval to allow use of the structure.

Findings:

By definition, the dewatering sump meets the criteria for an impoundment. Impoundment is defined in R645-100-200 as a dam, embankment, or other structure used to impound water, slurry, or other liquid or semi liquid material. The dewatering sump structure is considered a temporary impoundment that will be designed to move to locations relative to active mining where upgradient alluvial groundwater can effectively be captured and transported to a sump collection system. As such, temporary impoundments are required to comply with applicable regulations cited in R645-301-733.210. The Division has determined that the impoundment does not meet the sizing criteria for a Mine Safety and Health Administration (MSHA) impoundment or Natural Resources Conservation Service (NRCS) Class B or C criteria for dams. As such, the regulations relating to MSHA-qualified or NRCS-qualified

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impoundments and dams do not apply. The Division has also determined that in the absence of an engineered outlet from the impoundment to Lower Robinson Creek, the rules relating to discharge structures under R645-301-744 do not apply. The application lacks a considerable amount of engineering information required for a temporary impoundment. The Permittee is required to address the following regulations in their plan:

[R645-301.724.100]: The applicant must provide ground water quantity descriptions with details of approximate rates of discharge and flow within the alluvium. These estimates should be based on a worst-case precipitation event using the thickest section of alluvium that can be treated by a trench conveyance system and based on a 100-year, 24-hour precipitation event.

[R645-301.742.122]: The applicant should provide an updated surface water map that includes surface flow changes that result from the construction of the exclusion berm.

[R645-301-514.300]: The application must include a statement stating that the impoundment has been inspected by a professional engineer or specialist experienced in the construction of impoundments will inspect the impoundment during construction, after construction, and then yearly until removal of the structure. The professional engineer or specialist will report when any potential hazards exist in accordance with -515.200. The applicant will provide a certified inspection report to the Division in accordance with the requirements of R645-301-514.312 & 313.

[R645-301-533.110 & 301-733.240]: The application must demonstrate that all temporary impoundments are designed to meet the criteria of a minimum safety factor of 1.3, or demonstrate that all impoundments meet all the applicable criteria outlined in R645-301-733.210.

[R645-301-533.200 thru 500]: The application must contain additional information stating that design requirements for foundations, slope protection, and stabilization for the faces of the embankments for a temporary impoundment have met all applicable criteria outlined in -533.210 thru 500.

[R6545-301.743.130 & -132]: An appropriately-sized spillway design for the impoundment will be required in order to safely pass the design storm event. (*This deficiency was identified in the Division's December 21, 2011 correspondence but was not addressed in the January 17, 2012 response application*). In this case, the applicable specified design storm event is referenced in -743.300. In lieu of meeting the requirements of -743.130, the Permittee may opt to meet the requirements of a sediment pond as outlined in -742.224.

RECOMMENDATIONS:

Approval is not recommended at this time until the above deficiencies are addressed.

TECHNICAL ANALYSIS:

OPERATION PLAN

HYDROLOGIC INFORMATION

Regulatory Reference: 30 CFR Sec. 773.17, 774.13, 784.14, 784.16, 784.29, 817.41, 817.42, 817.43, 817.45, 817.49, 817.56, 817.57; R645-300-140, -300-141, -300-142, -300-143, -300-144, -300-145, -300-146, -300-147, -300-147, -300-148, -301-512, -301-514, -301-521, -301-531, -301-532, -301-533, -301-536, -301-542, -301-720, -301-731, -301-732, -301-733, -301-742, -301-743, -301-750, -301-761, -301-764.

Analysis:

Groundwater Monitoring

The Permittee indicated in their amendment cover letter that groundwater monitoring wells Y-38 and Y-61 will be monitored for acidity based on a request made by the Division. This monitoring period is to extend for a two-year time period until data can be reevaluated to determine if acidity is being produced in groundwater wells screened in the coal seam. At that time data can be reevaluated to determine if acidity is being produced in groundwater wells screened in the coal seam.

Additional corrections were also made to Table 7-5 for other sampling locations listed in the water monitoring plan. Springs SP-14 and SP-20 have changed from Protocol 4 to Protocol 3, adding quarterly operational field and laboratory water quality measurements at these locations. Well LS-28 added Protocol 5 to the plan adding quarterly operational field and laboratory water quality measurements at this well. A pond located near Sorenson Pond (SP-19) is being discontinued. The quality of data is questionable due to the area often being inundated with snowmelt or excess runoff from the nearby trough. A comment was added to SP-3 indicating that the spring has been piped and developed down canyon in Sink Valley Wash.

Findings:

[R645-301.724.100]: The Permittee has added a revision to Table 7-4 adding a new protocol (Protocol 7) to include the acidity sampling at monitoring wells Y38 and Y-61. The Permittee has also updated the sampling requirements at locations SP-14, SP-20, LS-28 adding operational laboratory parameters to the quarterly monitoring program. SP-19 is being discontinued due to the lack of quality data. Updates to the water monitoring tables 7-4 and 7-5 meet the Utah Coal Rules and are recommended for approval.

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Water-Quality Standards and Effluent Limitations

The Permittee has received approval from the Utah Division of Water Quality to include a new permitted outfall location intended for the discharge of upgradient alluvial groundwater. The location of the new outfall is listed as outfall location 005 and has the same effluent limitations applied to it as all other outfall locations in the permit. The outfall is located at the beginning of the temporary diversion of Lower Robinson Creek and will remain in place once the diversion has been reclaimed and LRC has been restored to its natural channel configuration. A copy of the revised Utah Pollution Discharge Elimination System (UPDES) permit UTG040027 is included in Appendix 7-12. Water quality and discharge rates will be monitored in accordance with the UPDES permit.

Findings:

It should be noted that the UPDES permit expires in April 2013. At that time, the Permittee will need to submit a current copy of the UPDES permit to the Division. No further action is recommended at this time.

Groundwater Monitoring Plan

The alluvial groundwater management plan submitted by the Permittee as part of Appendix 7-9 proposes to intercept alluvial groundwater by excavating trenches upgradient of the mine pits perpendicular to groundwater flow. Each trench will be constructed such that there will be a slight gradient to allow water to flow and collect at a downgradient end of the trench. Water would then be allowed to settle and the water will then be piped to a sump located near the UPDES outfall. Water will then be transferred from the sump location to the discharge outfall. The Permittee has submitted an alluvial groundwater management plan integrated into Appendix 7-9 describing the processes used to divert groundwater away from the mine pits so that a minimal amount of water from upgradient groundwater will need to be pumped from the mine pits into the sediment ponds. The Permittee submitted Figures 1-3 in Appendix 7-9. Figure 1 is a cross-sectional view of the underlying geology and how the intercept trenches will work to prevent groundwater from entering the mine pits. Figure 2 shows the mine pit sequences, the general flow directions of groundwater at different areas of the permit boundary and the location of the dewatering sump. A sump construction as-built diagram and pumping protocol will be designed to minimize any disturbance of sediment and allow for suspended solids to settle before discharging to LRC. The Permittee has also submitted an updated Figure 5-3 to reflect the location of the sump impoundment on the Surface Facilities Map.

Findings:

[R645.301-722]: The Permittee submitted the required corrections to Figure 2 showing the location of the sump. All other figures have been updated to reflect the current conditions. No further action is required.

Probable Hydrologic Consequences Determination

The Probably Hydrologic Consequences section of the MRP found in Section 728 of the MRP has been updated to include a reference to the implementation of the alluvial groundwater management plan. The plan is referenced in Appendix 7-9.

Findings:

[R645-301.728.333]: The Permittee has referenced the groundwater management plan on Page 7-34 and 7-40 of the MRP addressing the alluvial groundwater and has integrated the management plan into Appendix 7-9 in the MRP. Page 7-40 of Section 728.333 references the location of the groundwater management contingency plan in Appendix 7-9. The Permittee has adequately addressed this deficiency. No further action is required.

Diversions: Miscellaneous Flows

The diversion of alluvial groundwater falls into the category of Diversion of Miscellaneous Flows under regulations 742.330 of the Utah Coal Rules. The alluvial groundwater trenches that the Permittee will construct will be required to meet the standards of a peak runoff of a 2-year, 6 hour precipitation event. The alluvial groundwater management plan referenced in Appendix 7-9 addresses the construction of trenches. The trenches will be constructed so as to minimize contributions of surface water runoff. To minimize infiltration of surface water, 5 foot tall exclusion berms will be constructed on both the upgradient and the downgradient margins of the trenches as indicated by Figure 1 submitted as part of Appendix 7-9. Small amounts of precipitation are expected to fall directly into the trench but the amount would not be considered significant enough to exceed the 2-year, 6-hour storm event.

Findings:

[R645.742.333]: The Permittee has addressed concerns that the temporary upgradient trenches used to reroute groundwater to the sump collection system will meet the 2-year, 6-hour standard. The Permittee presented a diagram of the bermed trenches as Figure 1 of Appendix 7-9. The Permittee has adequately addressed this deficiency. No further action is required.

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Impoundments

The Permittee has submitted the following engineer-certified updates to Drawing 5-3 - Facilities and Layout map and Figure 3 in Appendix 7-9. Drawing 5-3 was certified by Larry J. Adams on December 15, 2011. Figure 3 was certified by Dan J. Guy, P.E. on December 15, 2011. Drawing 5-3 shows the locations of the current location of the groundwater intercept trench, as well as the location of the dewatering sump adjacent to the UPDES outfall location 005. Figure 3 represents an as-built diagram of the dewatering sump structure showing the dimensions of the structure and its storage volume capacity.

The Alluvial Groundwater Management plan provides a description of the how upgradient alluvial groundwater will be captured by temporary intercept trenches and eventually routed to the dewatering sump where the water will be allowed to settle out solids prior to pumping it to UPDES outfall location 005 to the Lower Robinson Creek drainage. The impoundment design is discussed in (Appendix 7-9). The plan discusses the construction of the impoundment as being a below grade structure with 5 foot high exclusion berm surrounding it. The Permittee indicates that the sump will be designed to accommodate the 10-year, 24-hour design storm event. Point precipitation frequency estimates were referenced in the narrative as being from the NOAA website for a two-year, 6-hour storm event, which for Alton Utah was presented as 2.00". According to information the Division found from the NOAA website: http://hdsc.nws.noaa.gov/hdsc/pfds/pfds_map_cont.html?bkmrk=ut, the 10-year, 24-hour precipitation event was listed as 2.39 inches and the 2-year, 6-hour storm event was listed as 0.96" for the Alton area. The calculated storage amount of water for the 10-year, 24-hour storm event was presented as 8,800 gallons of water. No information showing how these calculations were computed was provided. The impoundment is sized to handle 648,889 gallons and will easily accommodate the 10-year, 24-hour storm.

The Permittee indicated that there is no need for an engineered outlet because there is no discharge outlet to the impoundment and that all water will be pumped out of the pond manually in accordance with the pumping protocol described in Appendix 7-9. Therefore, the impoundment would not be required to be equipped with a discharge structure at its outlet under the R645-301-744 rules.

No information regarding a spillway structure was described in the application. According to the 743.130 rules for impoundments, a spillway is required for all temporary impoundments constructed either as combination of principal and emergency spillways, or a single spillway designed to safely pass a design precipitation event as specified in R645-743.300 for ponds not meeting the MSHA rule 30 CFR 77.216 (a) criteria. In this rule, the design storm event is a 25-year, 6-hour event.

Findings:

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Performance Standards

Section 750 of the Utah Coal Rules are a series of performance standards that are designed to minimize the disturbance to the hydrologic balance within the permit and adjacent areas and to prevent material damage to the hydrologic balance outside the permit are. This includes complying with water quality and effluent limitations in the UPDES permit, and minimizing the diminution or degradation of the groundwater quality and refraining from significantly altering the normal flow of water in a drainage channel.

The Permittee submitted a pumping protocol amended to the alluvial groundwater management plan. According to the protocol, dewatering will occur on an intermittent basis after water has accumulated in the impoundment and given time to settle out any solids. Pumping will take place at a rate of 40 gallons per minute (gpm) and stop once a drawdown of 5 feet has been reached. The discharge location for the pump outfall is Lower Robinson Creek at permitted UPDES Outfall location 005. Erosion control measures have been designed at the discharge location at the temporary diversion of LRC consisting of rip rap and an energy dissipating device to slow the flow on the end of the discharge hose. The Permittee has indicated that the temporary diversion of LRC is an engineered channel designed to be stable and resist erosion. The natural channel of LRC was documented as unstable in its pre-mining state. The reclamation plan will only require that the channel be returned to its pre-mining state. The operator makes the case that pumping at a rate of 40 gpm will not likely result in any major erosion to the stream channel and that the channel is often subject to snow melt and precipitation events of similar magnitude.

Findings:

[R645-301-750]: The pumping protocol submitted with the alluvial groundwater management appendix is adequate to satisfy the deficiency. No further action required.

RECOMMENDATIONS:

Approval is not recommended at this time until the above engineering deficiencies for the impoundment structure are addressed.