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# TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

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June 11, 2012

TO: Internal File 

THRU: Daron Haddock, Team Lead

FROM: James Owen, Engineer 

RE: Drainage Control Adjustments, Alton Coal Development, Coal Hollow Mine, C/025/005, Task # 4101

## SUMMARY:

On May 21 2012, The Utah Division of Oil Gas & Mining (Division) received and application for an amendment to the Mining and Reclamation Plan (MRP) of the Coal Hollow Mine. The primary purpose of the address deficiencies identified in a previous application for the inclusion of a plan for the management of alluvial groundwater that has been encountered during surface coal mining activities.

This memo addresses the application's compliance with the engineering (R645-301-500) and bonding (R645-301-800) sections of the Utah Coal Mining Rules. The following deficiencies were identified:

- **R645-301.533.712; .526.155-**. Figure 1 of the application includes anticipated design details for the perforated pipe and culvert system (de-watering well). The Division requires that a more complete standard design for the system be provided. The standard design must include all pertinent data with anticipated dimensions of all aspects of the system, construction requirements, as well as all pertinent drawings, cross sections, etc. The applicant must remove all language from the application indicating the designs of the system may vary based on site-specific conditions. Any deviations from the standard design must be submitted to the Division as amendments to the MRP.
- **R645-301-800** The applicant must provide information on the maximum amount of interceptor drains that may be constructed in disturbed areas that are not intended to be mined. The applicant must update its bond calculation estimates to account for these facilities. The Division must consider these as support facilities and will need to verify that the permittee is adequately bonded for demolition of the structures.

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TECHNICAL ANALYSIS:

**OPERATION PLAN**

The following deficiencies were identified during the initial review process:

- **R645-301.532; 742.122.** *The applicant states that the intercept trench is not intended or designed to convey surface runoff waters and that surface-water exclusion berms will keep surface water (save direct precipitation) from entering the trench. If the exclusion berm is directing surface water away from the trench, it is acting as an embanked diversion. The plan does not include: designs for berm construction or stability, description of material used for berm construction, information on the amount of surface water the exclusion berm will re-direct, where the surface water will be re-directed to, or how the re-directed water will be treated.*

The applicant states that with the new Alluvial Groundwater Management Plan (AGMP), the intercept drain does not use exclusion berms and the finished grade of the land surface above the drain will match adjacent areas such that alterations of existing surface water drainage patterns will not occur.

- **R645-301.533.110.** *The applicant states that the intercept trench will be constructed with a 2% gradient and that water collected at the down-gradient end of the intercept trench will be transferred by pipe to the de-watering sump. Based on this description, the intercept trench appears to be an impoundment, or a structure used to collect and hold water until it is pumped to the next impoundment. As an impoundment, the trench will need to be appropriately designed. This should include specification for safety factor, trench wall stability, expected capacity, etc. The applicant states that the trench will be appropriately sized to pass anticipated volumes. The Division needs information on what criteria will be used to determine the "appropriateness" of the size as well as estimates of the anticipated volumes the trenches will hold (maximum). The applicant states that the designs of the trenches may vary, which is reasonable. However, there should be a set of criteria defined that the applicant is using to determine the design. Comparing this criteria to what is being done on the ground will allow the Division to determine (during inspection) if the trenches are truly being constructed according to good engineering practices, as the applicant states. A standard design should be provided with detailed calculations, drawings, cross sections, etc. The Division will expect that variations to the standard design may be required based on site specific conditions. Since the trench qualifies as a temporary impoundment, it must be appropriately designed.*

The applicant states that with the new AGMP, the intercept drain is backfilled to surrounding topography. With this design there are no longer impoundments.

- **R645-301-521.** *The applicant states that water collected in the intercept trench will be pumped to the collection sump. For completeness, the Division requests additional information on the system that will transfer the water from the trench to the sump. The applicant should include a plan with a narrative, descriptions, and calculations indicating how the relevant requirements are met in terms of the when the trench will be pumped (at what capacity or period of time), and the adequacy of all pumping, piping, and powering equipment that will be used in the system. The Division requests that when the details of pump size, configuration, etc. are submitted, that adequate calculations are provided indicating that the pumping*

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*system will be of sufficient capacity to accommodate the maximum size, length, and flow requirements of the system. Also, please include depictions of the system on Drawing 5-3 and Figure 2.*

The applicant states that with the new AGMP, all impoundments have been eliminated and there will therefore be no impoundments which need to be pumped.

- **R645-301-521.160.** *The colors used to depict diversion ditched on Drawing 5-3 should correlate to the colors used in the drawing's legend.*

The drawing is no longer part of the application.

- **R645-301-533.713.** *The applicant should include a description of how the trenches will be maintained. Particularly, what will guarantee that the collected alluvial groundwater will remain uncontaminated? How will the sidewalls of the trench be kept stable? Please include a descriptive narrative as well as detailed calculations and drawings.*

With the new AGMP, all impoundments have been eliminated from the application.

- **R645-301-533.714.** *The Division requests information on when and how the trench and piping system will be removed as it relates to the mining progress. The description should also include a timetable and detailed plans on the removal of the trench and piping system*

This deficiency was addressed in the new AGMP on page 7 under item #17.

- **R645-301-533.712.** *The applicant states that minor quantities of groundwater could potentially be encountered within the coal seam or from the overlying shale and could be managed within the mine pits. The Division requests information on the volume and flow of water that could be managed in the pit, as this directly correlates to the volume and flow of alluvial groundwater that must be re-directed. The Division requests clarification, in descriptive narrative, on whether or not the intercept trench will always be constructed with its base at the top of the tropic shale. The Division needs to know how deep the trench will need to be, in relation to the depth of the alluvium, in order to capture the amount of water needed for the remainder of the water in the pit to remain manageable.*

The application states that the mine currently maintains a mine-water pump and associated piping at the mine pit area with a pumping capacity of 100 gpm. The mine maintains several additional pumps on site with lower capacities. The total capacity of these pumps greatly exceeds the greatest quantity of sustained groundwater inflow observed to date at the Coal Hollow Mine. In addition to the capacity of the pumps currently maintained at the mine site, additional pumps are readily available on the commercial market which could be brought to the mine on short notice.

Accordingly, through the use of existing mine pit alluvial water management strategies, including the use of existing pumping equipment and the potential acquisition of additional pumping equipment where necessary, the mine is capable of managing within the mine pits several hundred gallons per minute of mine water inflows if such a contingency were to become necessary. Assuming that several hundred gallons per

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minute can be managed in the mine pit, it follows based on the information in Table 7-9 that in all proposed mining areas (with the exception of the SS well cluster area at the extreme southern end of the permit area where the coal has apparently been burned away and no mining will occur), it appears likely that all of the currently anticipated intercepted alluvial groundwater in the mine pit areas could be managed within the pits without the implementation of an up-gradient dewatering drain system for the alluvial groundwater system. Under the current operating configuration at the Coal Hollow Mine, there is the potential to manage appreciable quantities of water within the mine pits. The management of mine water within in the pit includes:

- 1) The capacity to discharge water pumped from the mine pits to sediment Pond 3 (or Pond 4 in the Sink Valley Wash drainage) for UPDES permitted discharge to receiving drainages
- 2) The pumping and consumption of mine pit water for use as dust suppression water or water for other mining-related use. Historically, the mine has consumed on a continuous flow basis approximately 20 gpm for dust suppression activities at the mine and adjacent area
- 3) The ability to bury residual mine water present in a mine pit at the time that the pit is backfilled.

## 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:

The application states that the alluvial groundwater interceptor drains will be appropriately sized to adequately pass the encountered quantities of intercepted alluvial groundwater and that the specific design of individual alluvial intercept trenches will likely be variable from location to location based largely on the nature of the alluvial materials encountered.

### Findings:

Contents and information provided are not sufficient enough to meet the minimum requirements of this section of the Utah Coal Mining Rules. The following deficiencies were identified:

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- **R645-301.533.712; .526.155-** Figure 1 of the application includes anticipated design details for the perforated pipe and culvert system (de-watering well). The Division requires that a more complete standard design for the system be provided. The standard design must include all pertinent data with anticipated dimensions of all aspects of the system, construction requirements, as well as all pertinent drawings, cross sections, etc. The applicant must remove all language from the application indicating the designs of the system may vary based on site-specific conditions. Any deviations from the standard design must be submitted to the Division as amendments to the MRP.
- **R645-301-800** The applicant must provide information on the maximum amount of interceptor drains that may be constructed in disturbed areas that are not intended to be mined. The applicant must update its bond calculation estimates to account for these facilities. The Division must consider these as support facilities and will need to verify that the permittee is adequately bonded for demolition of the structures.

**RECOMMENDATIONS:**

Deficiencies must be adequately addressed before approval. Application should be denied and returned deficient.