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TECHNICAL MEMORANDUM

Utah Coal Regulatory Program

April 23, 2012

TO: Internal File

THRU: Daron Haddock, Coal Program Manager

FROM: Steve Christensen, Environmental Scientist SCC

RE: Evaluation/Revision of Groundwater Monitoring Plan, Consolidation Coal Company, Emery Deep Mine, C/015/0015, Task ID #4055

SUMMARY:

On September 15th, 2011, the Division of Oil, Gas and Mining (the Division) received an amendment (Task ID #3898) from Consolidation Coal Company (the Permittee). The amendment outlines revisions of the ground-water monitoring plan currently approved in the Emery Deep Mining and Reclamation Plan (MRP). The Division identified deficiencies with the amendment and returned it on November 14th, 2011. On March 23rd, 2012, the Permittee submitted a response to those deficiencies.

The initial amendment was submitted in response to a notice of violation issued June 30th, 2011 (NOV #10088). NOV #10088 was issued for failing to provide required water monitoring data as outlined in Table VI-17 of the approved MRP (See page VI-56). NOV #10088 required the Permittee to submit an amendment to the Division that revised the water monitoring plan to accurately reflect the current conditions on the ground. The revision was to take into account historical water monitoring data and the condition of the water monitoring sites. The condition of numerous water monitoring wells had been reported as being either broken, inaccessible or impacted. The revision was to address these conditions and determine whether the wells could be repaired, and if not, propose alternative data collection measures that would effectively detect any potential impacts to the hydrologic balance as a result of mining activity.

The amendment has addressed the previous deficiencies and should be approved at this time.

TECHNICAL ANALYSIS:

ENVIRONMENTAL RESOURCE INFORMATION

Regulatory Reference: Pub. L 95-87 Sections 507(b), 508(a), and 516(b); 30 CFR 783., et. al.

HYDROLOGIC RESOURCE INFORMATION

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

Analysis:

Probable Hydrologic Consequences Determination

The previous review (Task ID #3898) identified a deficiency relative to Probable Hydrologic Consequences Determination (PHC) requirements of the State of Utah R645-Coal Mining Rules.

The Permittee reported several wells as having been impacted by or containing oil. Monitoring wells AA-M, AA-U, H-L, H-M, H-U, I-B, I-L, I-M, R2-U and Lewis-U have all been identified as having contained oil. In order to evaluate potential impacts to ground and surface water resources, additional information was requested.

The Permittee was directed to revise the Probable Hydrologic Consequences Determination (PHC) of the approved MRP to address potential hydrocarbon contamination of ground and surface water resources within the permit and adjacent area of the Emery Deep Mine as oil had been reported in monitoring wells AA-M, AA-U, H-L, H-M, H-U, I-B, I-L, I-M, R2-U and Lewis-U.

On page VI-27 in the Potential Hydrocarbon Contamination section of the PHC determination of the amendment, the Permittee discusses how motor was "introduced into some of the monitoring wells several years ago for reasons that are not clear." The text subsequently directs the reader to Appendix VI-18.

Appendix VI-18, Evaluation of Oil in Emery Mine Monitoring Wells, provides a report prepared by EarthFax Engineering, Inc (dated March 12th, 2012). The report provides the results of an evaluation of the oil contained in the aforementioned monitoring wells. The purpose of the evaluation is to address the potential extent and magnitiude of hydrocarbon contamination in groundwater systems within and adjacent to the Emery Deep Mine permit area.

The cover letter of the report discusses how beginning in 2001, several of the monitoring wells began to develop probe access problems. As a result, mine personnel (no longer associated with the Permittee) poured motor oil into the wells in order to ease the access of the probe into the lower/water bearing portions of these hard to access monitoring wells. The motor oil was introduced into the wells to allow for easier movement of the water level probe down the well casing. The unfortunate result of this was that future water-level data collection in those wells was difficult since the oil would coat the probe and not allow a conductive connection to be made with the water surface. In addition, cross contamination resulted in oil being introduced into other wells within the groundwater monitoring network. As a result, the Permittee reported the following groundwater monitoring wells as having been impacted by oil:

- AA-U, AA-M
- H-U, H-M, H-L
- I-B, I-M, I-L
- R2-U
- Lewis

With the exception of the Lewis well, each of the above wells was completed with a 1-inch diameter galvanized steel casing. The Lewis wells was a former private water-supply wells that has been abandoned.

In order to verify the presence or absence of oil in the wells, the Permittee conducted the following investigation:

1) An electronic water-level indicator was lowered into each well to determine if a water-level measurement could be collected. Upon retrieving the probe at the surface, it was examined to determine if any oil was detectable on the proble.
2) A ½" diameter weighted bailer was lowered into each well to obtain a sample.
3) The liquids in the bailer were then evaluated/observed. If free oil was present in the bailer, a separate sample was collect4ed. Water samples were analyzed by American West Analytical Laboratories for benzene, ethylbenezne, naphthalene, toluene and total xylenes. Oil samples were analyzed by Savant, Inc. in Midland, Michigan for kinematic viscosity, simulated distillation by gas chromatography and elemental analysis by ICP.

General observations made during the field investigation are provided in Table 1. The results of the laboratory analyses of the samples are summarized in Tables 2 and 3 of Appendix VI-18. No constituents were measured in the groundwater at concentrations that exceeded applicable drinking-water standards. The results presented in Table 3 indicate that the properties of the oil are consistent with motor oil.

As a result of the presented data, it would appear that the oil detected in the monitoring wells is of minimal extent and does not present a potential aquifer contamination issue.

Findings:

The amendment meets the Probable Hydrologic Consequences Determination requirements of the State of Utah R645-Coal Mining Rules.

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 amendment was submitted in response to a notice of violation issued June 30th, 2011 (NOV #10088). NOV #10088 was issued for failing to provide required water monitoring data as outlined in Table VI-17 of the approved MRP (See page VI-56). NOV #10088 required the Permittee to submit an amendment to the Division that revised the water monitoring plan to accurately reflect the current conditions on the ground. The revision was to take into account historical water monitoring data and the condition of the water monitoring sites. The condition of numerous water monitoring wells had been reported as being either broken, inaccessible or impacted. The revision was to address these conditions and determine whether the wells could be repaired, and if not, propose alternative data collection measures that would effectively detect any potential impacts to the hydrologic balance as a result of mining activity.

Table VI-17, Emery Mine Hydrologic Monitoring Program, has been revised to reflect the removal of the wells that will no longer be monitored.

Appendix VI-17, Evaluation/Revision of Groundwater Monitoring Plan (08/2011) provides a discussion/presentation of the process the Permittee undertook in determining which wells could be eliminated from the groundwater monitoring program. Of the 46 monitoring wells that are currently part of the groundwater monitoring program for the mine, the amendment proposes eliminating 31 of them.

Table 1 of Appendix VI-17 provides a summary of the trends observed at each monitoring well, the wells' conditions and recommendations regarding whether each well should be retained or eliminated from the groundwater monitoring program.

The previous technical analysis directed the Permittee to provide additional groundwater monitoring data. Oil has been reported in monitoring wells AA-M, AA-U, H-L, H-M, H-U, I-B, I-L, I-M, R2-U and Lewis-U. The Permittee was directed to provide additional sampling of the wells must in order to determine the nature, chemical composition and extent of potential hydrocarbon contamination. The Permittee has provided the additional data from the impacated wells in Appendix VI-18, *Evaluation of Oil in Emery Mine Monitoring Wells.*

Findings:

The amendment meets the groundwater monitoring requirements of the State of Utah R645-Coal Mining Rules.

RECLAMATION PLAN

MINE OPENINGS

Regulatory Reference: 30 CFR Sec. 817.13, 817.14, 817.15; R645-301-513, -301-529, -301-551, -301-631, -301-748, -301-765, -301-748.

Analysis:

The amendment meets the State of Utah R645-Coal Mining Rule requirements for the reclamation of mine openings. The previous technical analysis (Task ID #3898) identified a deficiency relative to Section VI.4.8, *Casing and Sealing of Wells* (See page VI-39) and Section VI.6.5, *Permanent Casing and Sealing of Wells* (See page VI-41). The Permittee was directed to revise the approved MRP to identify the the techniques/methods that will be utilized when permanently sealing monitoring wells that are no longer required.

On page VI-41 of the amendment, the Permittee states, "*...each monitoring well or borehole associated with the Emery Mine will be capped, sealed, backfilled or otherwise properly managed, as required by the Division and in accordance with the most current regulations concerning well abandonment as promulgated by the Utah Division of Water Rights*".

Findings:

The amendment meets the State of Utah R645-Coal Mining Rule requirements for the reclamation of mine openings.

RECOMMENDATIONS:

The amendment should be approved at this time.

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