

WATER QUALITY MEMORANDUM

Utah Coal Regulatory Program

June 28th, 2016

TO: Internal File

THRU: Daron Haddock, Permit Supervisor

FROM: Steve Christensen Environmental Scientist 

RE: 4th Quarter 2015, Water Monitoring, Consolidation Coal Company, LLC,
Emery Deep Mine, C/015/0015, WQ15-4, Task ID #5039

The Emery Deep Mine is currently an in-active coalmine. The coal mining operation previously utilized room and pillar mining techniques with the use of a continuous miner machine. The mine went into temporary cessation in late 2010. The coal reserves were fully extracted (thus falling into the planned subsidence category).

The approved Mining and Reclamation Plan (MRP) outlines the water monitoring requirements beginning on page VI-28. Table VI-17, Emery Mine Hydrologic Monitoring Program contains a comprehensive list of all groundwater (springs/seeps), surface water, groundwater monitoring wells and Utah Pollutant Discharge Elimination System (UPDES) outfalls. Plate VI-4, Ground Water Monitoring Well and Surface Water Monitoring Site Location Map depicts the locations of the various ground and surface water monitoring sites (including the UPDES discharge/outfall points).

As part of the approved water monitoring requirements cited above, the Permittee is required to submit an annual groundwater evaluation of the two Emery Town wells (Emery Town Well #1 and Emery Town Well #2). The Emery town well information is submitted with the Emery Deep Mine's annual report. The information is in addition to the quarterly monitoring/sampling that is required at the wells.

1. Was data submitted for all of the MRP required sites? YES NO

Springs

The MRP outlines the sampling of 5 springs within the permit and adjacent area. Flow and field parameters are sampled quarterly with water quality samples collected in the 2nd and 3rd quarters.

The Permittee reported a measurable flow only spring monitoring site SP-10. Spring monitoring sites SP-11, SP-13, SP-14 and SP-15 did not produce a measurable flow.

Streams

The MRP outlines the sampling of 8 surface water monitoring stations within the permit and adjacent area.

Of the eight surface water monitoring sites, five reported a measurable flow (SWMS-1a, SWMS-2, SWMS-3, SWMS-4, SWMS-5) and accompanying data. SWMS-8 did not produce a measurable flow. Surface water monitoring sites SWMS-9 and SWMS-10 were reported as not being accessible due to snow and ice conditions.

Wells

The MRP outlines the sampling of 15 ground water monitoring wells within the permit and adjacent area (See Table VI-17). Table VI-17 identifies 13 wells, however; “Emery Town” was completed as two wells (#1 and #2) and “T1” is comprised of monitoring wells T1-B and T1-U. Of the 15 wells, 5 are monitored quarterly for water level only. The remaining 10 wells are sampled for water quality on a quarterly basis with the exception of wells RDA-2, RDA-4, and RDA-6 (sampled annually in the second quarter for both field parameters and water quality).

Data/information was submitted for all of the water monitoring wells.

UPDES

The Emery Deep Mine’s Utah Pollutant Discharge Elimination system (UPDES) Permit, #UT0022616, identifies 8 outfalls (001, 002, 003, 004, 005, 006, 007, and 009). UPDES Outfall 008 is no longer an active water monitoring site. The discharges from each of the outfalls ultimately report to Quitchupah Creek, a tributary of Muddy Creek. The receiving waters are designated according to Utah Administrative Code (UAC) R317-2-13.1 as 2B, 3C and 4. Historically, only Outfalls 001 and 003 have ever recorded a discharge. UPDES Outfall 008 is no longer active.

The Water Quality Board for the Division of Water Quality (DWQ) approved a rule change that allows for a site specific, in-stream standard for the Emery Deep’s effluent limitations based on its sulfate (SO₄) concentrations (as opposed to previous total dissolved solids-TDS standard). The new standards are identified in the currently approved UPDES permit (effective July 1st, 2012). The modified standard established an allowable TDS concentration of 4,766 ppm (maximum monthly average) and SO₄ concentration of 3,366 ppm (maximum monthly average). The currently approved UPDES permit will expire on June 30th, 2017.

UPDES Parameter	Established Limit
TSS	70 ppm (daily maximum)
T-Fe	1.4 ppm
Oil/Grease	10 ppm

pH	6.5-9.0
TDS	4,766 ppm (max. monthly avg)
SO4	3,366 ppm (max. monthly avg)

The Permittee submitted data for all required UPDES sites. Outfall 003 was the only monitoring point to report a discharge for this quarter.

2. Were all required parameters reported for each site? YES NO

Spring Monitoring Sites

All required data was submitted for the spring monitoring sites that produced a flow this quarter (as outlined in Table VI-17). Spring monitoring site SP-10 was the only spring to report a flow.

Surface Water Monitoring Sites

The Permittee submitted all required water quality data this quarter for the surface water monitoring sites that produced a measurable flow and could be accessed.

Water Monitoring Wells

The Permittee submitted the required data for all wells that are functioning. Issues with several wells have been identified in previous quarters (see discussion below). Based upon conversations with the Permittee, several of those issues have been addressed by rehabilitation efforts.

UPDES Monitoring Sites

The Permittee submitted all required data for UPDES monitoring site Outfall 003. None of the other UPDES outfalls produced a flow during this quarter.

The sulfate concentrations provided for Outfall 003 were well below the UPDES standard of 3,366 mg/L maximum monthly average. The average was 1,459.4 mg/L. The total dissolved solid concentrations were all well below the UPDES limit of 4,766 mg/L (average for the quarter was 2,909 mg/L). The total iron (T-Fe) concentrations were all below the UPDES limit of 1.4 mg/L (average for the quarter was 0.96 mg/L). All of the concentrations reported for total suspended solids were well below the UPDES limit of 70 ppm (many below the lab detection limit).

One flow value was provided for the quarter obtained on October 14th, 2015 (89.8 gpm). The Permittee reported zero flow for the remaining sampling events in the quarter.

3. Were any irregularities found in the data? YES NO

UPDES:

Outfall 003 reported an elevated total suspended solids concentration of 31 ppm the previous quarter. The total suspended solids concentration returned to within historical ranges for the entire quarter. No irregularities were reported for any of the required water quality parameters for 3rd or 4th quarter 2015.

Wells:

Monitoring well RDA-4 reported a drop in water elevation outside of two standard for the past three quarters. A depth to water increase was again reported this quarter (23.9' reported, 19.92' average).

Monitoring well H-U reported a significant drop in water level since 1st quarter of 2015. The water level continues to drop. Since 1st quarter 2015, the water level has dropped approximately 53.2 feet.

Emery Well #1 reported an elevated dissolved sodium concentration and a reduced concentration for total alkalinity during the 3rd quarter of 2015. Both parameters reported concentrations within established historical ranges this quarter.

Springs/Streams:

A slightly reduced total alkalinity value was reported for spring monitoring site SP-10 the previous quarter. The total alkalinity value reported for 3rd and 4th quarter of 2015 has remained within historic ranges.

Surface water monitoring site SWMS-9 reported several concentrations outside of two standard deviations from the mean during the 4th quarter of 2014. Elevated concentrations for chloride, sulfate, total hardness, total dissolved solids, total magnesium, total sodium, dissolved magnesium and dissolved sodium were reported that quarter. The reported concentrations for these parameters returned to established ranges 1st quarter of 2015. An increased chloride concentration was reported the previous quarter. The concentration has returned to historic value this quarter. A reduction in bicarbonate was reported 3rd quarter 2015 (137 mg/l reported versus 305.40 mg/l average). The site could not be accessed this quarter due to snow/ice conditions.

4. On what date does the MRP require a five-year re-sampling of baseline water data.

There is no commitment in the MRP to resample for baseline parameters.

5. Based on your review, what further actions, if any, do you recommend?

The Permittee must contact the Division and provide in writing:

1. The final outcome of the rehabilitation/repair efforts of impacted water monitoring wells.
2. Submit an amendment to the Emery Deep MRP as to how, given the limitations/issues associated with impacted water monitoring wells, that the approved monitoring plan is adequate to detect potential groundwater impacts as a result of coal mining activity. Based on the review by the Division, if the absence of the impacted wells renders the water monitoring plan inadequate, additional wells will need to be installed during the 2016 construction season. Monitoring wells USGS 4-1 and T1-U are still reported as “dry wells”. The Permittee must address the adequacy of the current water monitoring plan in the absence of these monitoring wells or face enforcement action.
 - a. The water monitoring amendment must address the dramatic declines in reported water level depths in monitoring wells RDA-4 and H-U.

Data collection issues have been identified at several water quality groundwater monitoring wells in previous quarters. Monitoring wells Kemmerer-L, USGS 4-1, RDA-6, T1-U and now SM1-3 had been noted as being unable to either produce water quality samples of sufficient volume as to submit for laboratory analysis and/or a water level reading for several quarters. Based on conversations with the Permittee and recently submitted water quantity and quality data, rehabilitation efforts have been successful with monitoring wells RDA-6 and SM1-3. The wells are now being monitored as directed in the approved MRP.

Water levels are now being reported for the Kemmerer-L well. In recent quarters, water quality data had been reported from the well; however, depth to water was not. The Permittee indicated that the pressure gauge needed to be replaced in order to obtain a water level. Based on recently submitted data, it appears that the pressure gauge has been replaced. The Kemmerer-L monitoring well was reported as being inaccessible this quarter.

Monitoring well RDA-6 is a water quality identified in Table VI-17 of the MRP as a water quality data collection well (in addition to field parameters and water elevation). Until the 2nd quarter of 2015, the last water quality data obtained from this well was in June of 2008. RDA-6 was completed to a depth of 40’ with a screen interval between 15’-35’ below grade. The water level had been reported as 19’ below grade for approximately the last 2 years; however, based on discussions with the Permittee, water quality data could not be obtained due to lack of water. A water level was provided for 3rd and 4th quarter 2014 and the 1st quarter of 2015. Water quality data is obtained from this well in the 2nd quarter. The Permittee has indicated that the well has been rehabilitated (April 2015) and is now functioning properly. Water quality data was provided for 2nd quarter 2015. The next water quality sampling will occur in 2nd quarter of 2016. The monitoring well appears to be functioning as intended.

Monitoring well R1-L (quarterly water level only) had reported erratic water levels. The Permittee has indicated that the monitoring well is artesian in nature and thus produces negative water levels as a result of the pressure. Negative water levels depths are now being

reported indicative of the pressure in the monitoring well.

Monitoring well SM1-3 is identified in the approved MRP as a water quality data collection site. Water quality data reporting had stopped after the 2nd quarter of 2014. According to the Permittee, the well has been rehabilitated and water quality data has been reported since 2nd quarter of 2015.

However; issues remain with monitoring wells T1-U and USGS 4-1. These wells are being reported as “dry wells”. The Permittee needs to address the adequacy of the currently approved water monitoring plan in the absence of these wells.

A revision to the current Emery Deep MRP must be submitted in order to modify the approved water monitoring plan. The Permittee has indicated that it will be submitted to the Division in coming weeks.

6. Does the Mine Operator need to submit more information to fulfill this quarter’s monitoring requirements?

YES NO

See Discussion Item 5 above.