

# WATER QUALITY MEMORANDUM

## Utah Coal Regulatory Program

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February 8<sup>th</sup>, 2017

TO: Internal File

THRU: Daron Haddock, Permit Supervisor

FROM: Steve Christensen Environmental Scientist 

RE: 2<sup>nd</sup> Quarter 2016, Water Monitoring, Consolidation Coal Company, LLC,  
Emery Deep Mine, C/015/0015, Task ID #5221

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 2<sup>nd</sup> and 3<sup>rd</sup> 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, all reported a measurable flow with accompanying data with the exception of SWMS-8, SWMS-9 and SWMS-10.

## 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 was not submitted for all of the required monitoring wells (see discussion below).

## 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 (SO<sub>4</sub>) concentrations (as opposed to previous total dissolved solids-TDS standard). The new standards are identified in the currently approved UPDES permit (effective July 1<sup>st</sup>, 2012). The modified standard established an allowable TDS concentration of 4,766 ppm (maximum monthly average) and SO<sub>4</sub> concentration of 3,366 ppm (maximum monthly average). The currently approved UPDES permit will expire on June 30<sup>th</sup>, 2017.

<b>UPDES Parameter</b>	<b>Established Limit</b>
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. None of the outfalls reported a discharge this quarter. The Permittee has indicated that the underground pump that had historically produced a discharge at Outfall 003 has been turned off. As a result, the outfall did not produce a discharge 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 did not provide all of the required data for monitoring wells for 2<sup>nd</sup> quarter 2016. Water quality data is required for monitoring wells RDA-2, RDA-4 and RDA-6. The wells are sampled annually. Based on the historic practice of the Permittee, the water quality for these wells was obtained in the 2<sup>nd</sup> quarter of the year. The data was not obtained for 2<sup>nd</sup> quarter 2016. However; upon review of the database, water quality data was submitted (with the exception of RDA-6) in the 3<sup>rd</sup> quarter of 2016. As the specific quarter in which the annual data is obtained from RDA-2, RDA-4 and RDA-6, the Division did not issue a notice of violation.

The required information was submitted for all of the remaining water monitoring wells.

### UPDES Monitoring Sites

None of the UPDES monitoring sites produced a flow this quarter.

**3. Were any irregularities found in the data?**

YES  NO

**Wells:**

Monitoring well T1-B reported an elevated carbonate concentration of 48 ppm (3.93 standard deviations from the mean of 4.0 ppm).

SM1-3 reported reductions in concentration for total hardness, dissolved magnesium and dissolved sodium 1<sup>st</sup> quarter 2016. These concentrations were within normal ranges for 2<sup>nd</sup> quarter 2016.

Monitoring well H-U continues to report declines in water elevation. It's unclear what is causing this drop in water level as mining has not been conducted since December 2010. Additionally, there is no known ground water utilization occurring in the area. Continued monitoring will be conducted. A drop of 65.9' has occurred in monitoring well H-U since 2<sup>nd</sup> quarter 2015.

Monitoring well R1-L has reported a depth to water of 462' the last four quarters.

Emery Well #1 reported an elevated dissolved sodium concentration and a reduced concentration for total alkalinity during the 3<sup>rd</sup> quarter of 2015. Both parameters reported concentrations within established historical ranges during the 4<sup>th</sup> quarter of 2015. An elevated concentration for field conductivity was reported 1<sup>st</sup> quarter 2016. A value of 2,420 umhos/cm was reported (5.08 standard deviations from the mean of 1248.46 umhos/cm). Dissolved magnesium was reported 2.00 standard deviations below the mean of 17.20 ppm with a value of 11.25 ppm. In the second quarter these concentrations were within normal range; however, an elevated field conductivity concentration was reported for 2<sup>nd</sup> quarter 2016.

**Springs/Streams:**

Spring SP-10 elevated concentrations for lab specific conductance and field conductivity.

Surface water monitoring sites SWMS-3, SWMS-4 and SWMS-5 reported elevated temperature readings for the 2<sup>nd</sup> quarter of 2016.

Surface water monitoring site SWMS-9 reported several concentrations outside of two standard deviations from the mean during the 4<sup>th</sup> 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 1<sup>st</sup> quarter of 2015. An increased chloride concentration was reported the previous quarter. The concentration returned to historic limits during the 4<sup>th</sup> quarter of 2015. A reduction in bicarbonate was reported 3<sup>rd</sup> quarter 2015 (137 mg/l reported versus 305.40 mg/l average). The site could not be accessed during the 4<sup>th</sup> quarter of 2015 due to snow/ice conditions.

Surface water monitoring site SWMS-9 reported several parameters during the 1<sup>st</sup> quarter of 2016 that were slightly outside of two standard deviations from the mean. Concentrations for chloride, sulfate, TDS, total cations, total anions and total magnesium noted slightly elevated values. SWMS-9 did not report a flow for 2<sup>nd</sup> quarter of 2016.

**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?**

NA

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

YES  NO