

# WATER QUALITY MEMORANDUM

## Utah Coal Regulatory Program

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September 25, 2014

TO: Internal File

THRU: Daron Haddock, Permit Supervisor

FROM: Steve Christensen Environmental Scientist 

RE: 1<sup>st</sup> Quarter 2014, Water Monitoring, Consolidation Coal Company, LLC, Emery Deep Mine, C/015/0015, WQ14-1, Task ID #4538

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 a 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 report was received by the Division on October 7<sup>th</sup>, 2013.

**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 for only spring monitoring site SP-10.

Spring monitoring sites, SP-11, SP-13, SP-14 and SP-15 did not produce a measurable flow this quarter.

## **Streams**

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

All but one (SWMS-8) of the eight surface water monitoring sites reported a measurable flow and accompanying data.

## **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 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 (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. 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).

### **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.

### **Water Monitoring Wells**

The Permittee did not submit the required data for all wells. Issues with several wells must be addressed. (See discussion below #5)

### **UPDES Monitoring Sites**

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

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

The following samples were reported outside of two standard deviations from the mean for streams and:

Sample ID	Date	Type of Site	Parameter	Value	Average	STD. Deviations
SWMS-5	3/10/2014	Stream	SO4	2,139 ppm	922.18 ppm	2.06
SWMS-5	3/10/2014	Stream	TDS	3,892 ppm	1,729.92 ppm	2.27
SWMS-5	3/10/2014	Stream	T-Ca	301.7 ppm	163.99 ppm	2.01
SWMS-5	3/10/2014	Stream	T-Na	538.39 ppm	216.11 ppm	2.44
SWMS-5	3/10/2014	Stream	F-Cond	4,420 umhos/cm	1,666.98 umhos/cm	2.73
SWMS-9	3/06/2014	Stream	Cl	255 ppm	129.99 ppm	2.16
SWMS-9	3/06/2014	Stream	T-Hdns	2,472 ppm	1,228.64 ppm	2.59
SWMS-9	3/06/2014	Stream	TDS	5,123 ppm	2,520 ppm	2.30
SWMS-9	3/06/2014	Stream	T-Mg	418.79 ppm	189.37 ppm	2.51
SWMS-9	3/06/2014	Stream	D-Mg	418.79 ppm	203.18 ppm	2.70

The following irregularities were found with the monitoring well and UPDES data:

Sample ID	Date	Type of Site	Parameter	Value	Average	STD. Deviations
H-U	3/19/2014	Monitoring Well	Depth	106.8'	58.14'	4.05
T1-U	3/14/2014	Monitoring Well	Depth	43'	326.22'	2.60
Kemmerer-L	3/14/2014	Monitoring Well	D-Ca	21.56 ppm	4.11 ppm	6.33
Kemmerer-L	3/14/2014	Monitoring Well	Bcrb	226 ppm	140.73 ppm	9.90
Outfall 003	2/3/2014	UPDES outfall	T-Fe	1.73 ppm	0.43 ppm	2.24

Water monitoring well H-U continues to show a drop in water level. The water level in monitoring well H-U has developed a downward trend since November 24<sup>th</sup>, 2010. It's unclear as to what is causing the drop in water level.

On October 11<sup>th</sup>, 2012, the Division received a citizen complaint from Mr. Jon Sundstrom. Mr. Sundstrom is a property owner in the area directly adjacent to the Emery Deep Mine permit boundary (T 22 S, R 06 E, SE ¼ of Section 15). Mr. Sundstrom is concerned that mining activity at the Emery Deep Mine may be impacting state appropriated water rights on his property. Mr. Sundstrom indicated that depressions have been forming on his property. On November 27<sup>th</sup>, 2012, the Division conducted a field inspection of the Sundstrom property. Six monitoring locations were established at depression areas in order to determine if slumping/settling was occurring at the property. At this time, it's uncertain as to whether mining activity is producing impacts on the Sundstrom property. The Division continues monitor water levels in well H-U (located in closest proximity to the Sundstrom property).

### **UPDES Sites**

Historically outfalls 002, 004, 005, 006, 007, 008 and 009 do not produce a discharge. These outfalls did not report a flow again for this quarter. Outfalls 001 and 003 are the primary outlets for discharging the ground water encountered within the mine works.

However, only Outfall 003 reported a flow this quarter. Outfall 001 did not report a flow this quarter. The TSS values reported for Outfall 003 were well within the established UPDES limits of 70 ppm. Additionally, all reported concentrations for TDS were within the UPDES limit of 4,766 ppm. All reported concentrations for SO<sub>4</sub> were well below the established limit of 3,366 ppm.

One exceedance was reported for T-Fe (2.56 ppm). The limit for T-Fe per the approved UPDES permit is 1.4 ppm.

#### **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?**

**Kemmerer-L Well:** The Kemmerer-L well is a water quality well to be sampled quarterly. The water quality data has been consistently submitted to the Division; however, water level data has not. The Permittee has indicated that the well is “sealed off” and a water level reading cannot be obtained. Upon review of the historical data, water levels were obtained from the Kemmerer-L well from 1973 to mid-2010.

The Permittee must address how water levels were obtained in the past and why water levels cannot be obtained currently.

Two monitoring wells have been reported as dry or having some type of obstruction in them: RDA-6 and T1-U.

As required by the approved MRP, water quality data is to be obtained from RDA-6 annually (historically in 2<sup>nd</sup> quarter). However, the last water quality data reported to the Division was on June 16<sup>th</sup>, 2008. Since that time, the water level has dropped approximately 7 feet. The depth to water has been reported at 19 feet since March 18<sup>th</sup>, 2013.

Table VI-2, *Monitoring Well Completion Information* indicates that well RDA-6 was completed to a depth of 40’ with a screen interval between 15’-35’ below grade. The Permittee must address why water quality samples cannot be obtained from this well given the reported water level of 19’ (well within the screened interval).

As required by the approved MRP, monitoring well T1-U is to be monitored quarterly for water quality parameters. The well has been reported as “dry” (or more recently reported as having a depth to water of 43’), thus no water quality data has been provided to the Division. Upon review of Table VI-2, *Monitoring Well Completion Information*, the well completion depth and screened interval is “unknown”.

The Permittee must address whether or not it’s possible to obtain water quality data from this well (i.e. determine depth of completion).

If, for whatever reason, the integrity of the wells has been impacted and quality and/or quantity data is not obtainable from these locations, the Permittee must address if the wells can be repaired. If the wells cannot be repaired, the Permittee must address how their ground-water monitoring plan needs to be revised (i.e. eliminate the wells or replace them). An amendment to the approved Mining and Reclamation Plan (MRP) would be required.

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

YES  NO

See Discussion Item 5 above.

