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# WATER QUALITY MEMORANDUM

## Utah Coal Regulatory Program

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June 22, 2011

TO: Internal File

THRU: James D. Smith, Permit Supervisor *JS 06/27/11*

FROM: Steve Christensen, Environmental Scientist *SC*

RE: 2010 4th Quarter Water Monitoring, Canyon Fuel Company (CFC), LLC, Dugout Mine, C/007/0039-WQ10-4, Task ID #3688

The Dugout Canyon Mine is currently operational in the Book Cliff Mountain range of Carbon County, UT. Water monitoring data is submitted quarterly to the Division EDI database. Beginning on page 7-40 of the approved Mining and Reclamation Plan (MRP), water monitoring protocols and sampling requirements are provided for surface water, ground water, monitoring wells and Utah Pollutant Discharge Elimination System (UPDES) outfalls. Tables 7-4 and Table 7-5 list the individual monitoring sites and their sampling protocols for ground water and surface water respectively.

**1. Was data submitted for all required sites?**

**Springs**      YES  NO

The approved MRP outlines the operational and post-mining monitoring of fourteen springs (200, 203, 227, 259 259A, 260, 321, 322, 324, SC-100, SC-116, SC-14, SC-65 and SP-200). The locations of these springs are depicted on Plate 7-1, Hydrologic Monitoring Stations. Groundwater discharge from the old Gilson coal seam workings is also monitored and identified as location MD-1.

*Data was submitted for all required spring monitoring sites.*

**Streams**      YES  NO

The approved MRP outlines the monitoring of thirteen stream sites (323, DC-1, DC-2, DC-3, DC-4, DC-5, FAN, PC-1A, PC-2, PC-3, RC-1, SS-1 and SS-2). Sites DC-4 and DC-5 are sampled during the first wet or dry year as conditions permit. The locations of these streams are depicted on Plate 7-1, Hydrologic Monitoring Stations.

*Data was submitted for stream monitoring sites with the exception of DC-4 and DC-5. Sampling of DC-4 and DC-5 occur during the first wet or dry year.*

**Wells**            **YES [X] NO [ ]**

The approved MRP outlines the sampling of three monitoring wells (GW-10-2, GW-11-2 and GW-24-1). Table 7-4 and Section 731.200 of the MRP specify that the Permittee will obtain quarterly water level measurements from the wells. Due to the ages of the wells and deterioration of the casing materials, water quality data is not collected.

Monitoring well GW-24-1 became blocked during the winter of 2000 and was last sampled in September of 1998. The well was removed from monitoring after the 4<sup>th</sup> quarter of 2004. Monitoring well G-11-2 was last monitored in October 2007. Since that time, the Permittee has reported that the well has appeared to have “caved in”. Monitoring well GW-10-2 is still functioning and actively monitored for water level.

Three additional monitoring wells (DH-1, DH-2 and DH-3) are monitored at the waste rock disposal site. Water levels are monitored quarterly.

*Water levels were obtained and reported for monitoring wells DH-1, DH-2, DH-3 and GW-10-2.*

**UPDES**            **YES [X] NO [ ]**

Operational monitoring is required monthly for six active UPDES outfalls (Permit No. UT0025593):

- **001**-Mine water discharge to Dugout Ck.,
- **002**-Sedimentation pond discharge to Dugout Ck. (disturbed area runoff),
- **003**-Storage water discharge to Dugout Ck. (30,000-gallon water tank discharge),
- **004**-Sedimentation pond (waste rock site) discharge to Grassy Trail Ck. Tributary,
- **005**-Pace Canyon fan portal breakout, mine water discharge to Pace Ck.
- **006**-Sediment trap culvert discharge to Pace Creek (disturbed area runoff from Pace Canyon Fan facility).

Specific effluent limitations and self-monitoring requirements as outlined in the UPDES permit are presented below:

<b>Effluent Characteristics</b>	<b>Effluent Limitations</b>
TDS, tons/day	1.0
Total Suspended Solids (TSS), ppm	70
Total Iron, ppm	1.1
Oil & Grease, ppm	10
Total Dissolved Solids (TDS), ppm	2,400
pH	9

3,000 parts per million (ppm) is the water quality standard for total dissolved solids (as

established by the Department of Water Quality) for both Pace Creek and Dugout Creek.

*UPDES outfalls 001, 002, 003 and 005 reported discharges for this quarter. Outfalls 004 and 006 did not report a discharge this quarter.*

**2. Were all required parameters reported for each site?**

**Springs**      YES  NO

*All required data was reported for the spring monitoring sites that had a measurable flow. No observable flow was reported for spring monitoring sites 200, 227, 259, 259A, 260, SC-100 and SC-14.*

**Streams**      YES  NO

*All required data was reported for the stream monitoring sites that had a measurable flow. No observable flow was reported for DC-1, DC-2, DC-3, PC-2 and RC-1.*

**Wells**      YES  NO

*All required parameters were reported for monitoring wells DH-1, DH-2, DH-3 and GW-10-2.*

**UPDES**      YES  NO

*All required parameters were reported for the UPDES outfalls that reported a discharge (001,002, 003 and 005). Outfalls 004 and 006 did not report a discharge this quarter.*

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

**Springs**      YES  NO

Springs SC-116 and SC-65 both reported elevated pH values. The pH values were outside of two standard deviations from the mean.

Springs 321 and 203 reported elevated temperature readings. The temperature readings were outside of two standard deviations from the mean.

**Streams**      YES  NO

Stream monitoring sites DC-1, DC-2, DC-3, PC-2 and RC-1 did not report an observable flow this quarter.

Monitoring site DC-2 had reported several elevated concentrations for total dissolved solids and its components during the 2<sup>nd</sup> quarter of 2010. However; no observable flow was reported for the 3<sup>rd</sup> quarter and again for this quarter. Continued monitoring will be conducted in order to detect a possible trend.

The FAN monitoring site below the Pace Canyon Fan portal had reported elevated concentrations for chloride and sulfate in the 4<sup>th</sup> quarter of 2009. Since that time, the chloride and sulfate levels have stabilized and returned to within two standard deviations of historic values.

Site PC-2 began developing an upward trend in TDS and its components in the 3<sup>rd</sup> quarter of 2009. However, since that time the reported concentrations for TDS and its components have been within historical trends as established by the data set.

**Wells**            **YES [X] NO [ ]**

Water level readings obtained from wells DH-1, DH-2, DH-3 and GW-10-2 were reported this quarter.

Monitoring well GW-10-2 has shown a drop in water level for the last three consecutive quarters. The reported depth to water this quarter was outside of two standard deviations from the mean with a reported depth to water value of 766.92'. The average for the water level depth is 742.21' based on quarterly water level monitoring since 1998.

**UPDES**            **YES [X] NO [ ]**

UPDES outfalls 001, 002, 003 and 005 reported flows this quarter.

Outfalls 001, 002 and 003 reported concentrations that were within the water quality limits as established by their UPDES permit.

However, Outfall 005 (mine water discharge from the Pace Canyon Fan Facility to Pace Creek) reported several concentrations that were outside the established water quality criteria. Total iron (T-Fe) was reported outside the 1.1 part-per-million (ppm) range for two sampling events. Additionally, total dissolved solid (TDS) concentrations were reported outside of the established 2,400 ppm threshold four times.

Representatives from the Dugout Canyon Mine informed the Division that they had experienced an upset condition. Due to a mine fire that required immediate attention, the Gilson 8 Panel had to be sealed off prematurely. The result was an increase in TDS and T-Fe that could not be avoided. The Permittee is currently in the process of altering the underground mine-water treatment system as well as exploring a possible surface water treatment facility in the event that

underground efforts fail. The Division of Water Quality has been informed as well and has determined that the spike in TDS and T-Fe was not a result of negligence, but rather due to the mine fire.

Continued monitoring of the mine discharge into Pace Creek will be conducted.

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

The resampling of baseline data will next be performed in July 2014. In addition, one water sample will be collected at each spring sampling point during low flow period every fifth year, during the year, preceding re-permitting. These samples will be obtained for the analysis of baseline parameters (See Table 7-4).

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

Continued monitoring of the monitoring sites exhibiting irregular data trends.