

WATER QUALITY MEMORANDUM

Utah Coal Regulatory Program

April 13, 2009

TO: Internal File

THRU: Jim Smith, Permit Supervisor

FROM: April A. Abate, Environmental Scientist II (Signature)
4-13-2009

RE: 2008 Fourth Quarter Water Monitoring, Canyon Fuel Company, LLC, SUFCO Mine, C/041/0002, WQ08-4, Task ID #3211

The SUFCO Mine is an operating longwall mine. Current operations are in the Quitchupah and Muddy Tracts. Water monitoring requirements can be found in Section 7.3.1.2 of the MRP, especially Tables 7-2, 7-3, 7-4, 7-5, and 7-5A. Page 7-48 contains the important statement that (non Box-Canyon, non-UPDES) "monitoring sites are sampled three times per year," meaning the second, third, and fourth quarters.

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

Springs

The MRP requires the Permittee to monitor 25 springs during the fourth quarter. Some require full laboratory analysis according to Table 7-4, while others simply require field measurements.

The Permittee submitted all required samples for the spring sites.

Streams

The MRP requires the Permittee to monitor 20 streams during the fourth quarter.

The Permittee submitted all required samples for the stream sites. One additional sample USFS-110 is listed in the database. This sample area represents the Upper Main Fork of Box Canyon Creek. This monitoring point is not listed in the MRP but data is provided by the operator on a voluntary basis.

Wells

The MRP requires the Permittee to monitor water levels for 4 wells during the fourth quarter.

The Permittee submitted all required samples for the wells. Monitoring data for four additional wells associated with the waste rock disposal site are listed in the database from wells WRDS-B3, WRDS-B5, WRDS-B6, WRDS-B8, WRDS-B9. These wells are also not listed in the MRP.

UPDES

The UPDES Permit/MRP require bi-weekly monitoring of 3 outfalls: 001, mine water discharge to Spring Canyon; 002, sedimentation pond discharge to Spring Canyon; and 003, the mine water discharge to the North Fork of Quitcupah Creek.

The Permittee submitted all required samples for the UPDES sites. Outfall 001 reported no flow this quarter.

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

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

Parameters Outside of Two Standard Deviations from the Mean

Several parameters fell outside of two standard deviations from the mean encountered for select stream samples. Some of the samples showed a decrease in temperature that appeared to correlate with an increase in the levels of dissolved oxygen. The parameters for SUFCO 006 stream samples were slightly on the alkaline side, showing elevated levels of dissolved calcium, magnesium and sodium and bicarbonate. However, the pH level was below 9.0 (the pH standard considered allowable based on UPDES permit guidelines) and the cations/anion ratio was within the normal 5% range.

Previous reports have chronicled a decline in water levels at Well 01-8-1 since SUFCO first began to monitor it in 2001. This well is screened in the Upper Hiawatha coal seam, the actively mined seam. As can be seen on the attached graph, a water level drop of approximately 275 feet was evident from the period between October 2005 and June 2008. Water levels appear to be equilibrating based on the past 3 rounds of data collection. Most other wells monitored at the SUFCO mine dropped less than 10' over a period of ten or more years. This is an expected result of underground coal mining, and water levels will equilibrate when mining is ceased.

The surface water standard generally accepted by the Department of Water Quality for Total dissolved solids (TDS) is considered 1,200 but can vary between watershed and stream reach. All stream and spring samples monitored during the 4th quarter were well below this standard.

Sulfate levels in stream sample 047A at the East Spring Canyon below the mine have showed levels of sulfate exceeding the EPA secondary standard. Sulfate is not toxic to plants or animals (even at very high concentration), but has a cathartic effect on humans in concentrations over 500 mg/L. For this reason, the EPA has set the secondary standard for sulfate as 250 mg/L. In addition to that, dissolved sodium levels at this sample location were outside two standard deviations and higher than normal during this quarter.

Reliability Checks

Many routine reliability checks fell outside of standard values:

Site	Reliability Check	Value Should Be...	Value is...
SUFCO 47	Conductivity/Cations	>90 & < 110	86.2
SUFCO 47	Na/(Na + Cl)	> 50%	46
SUFCO 007	Na/(Na + Cl)	> 50%	48
SUFCO 041	Mg/(Ca + Mg)	< 40 %	43
SUFCO 042	Mg/(Ca + Mg)	< 40 %	44
SUFCO 047A	Na/(Na + Cl)	> 50%	44
PINES 403	Na/(Na + Cl)	> 50%	48
WRDS-B6	TDS/Conductivity	>0.55 & <0.75	80
WRDS-B6	Conductivity/Cations	>90 & < 110	75
WRDS-B6	Na/(Na + Cl)	> 50%	23
WRDS-B6	Mg/(Ca + Mg)	< 40 %	46

Waste rock well WRDS-B6 had the most parameters outside of standard values. TDS and conductivity values in this well were very high. This is the well located in the center of the waste rock piles where you would expect to see higher TDS and conductivity values.

These inconsistencies do not necessarily mean that a sample is wrong, but it does indicate that something is unusual. An analysis and explanation of the inconsistencies by the Permittee would help to increase the Division's confidence in the samples. The Permittee should work with the lab to make sure that samples pass all quality checks so that the reliability of the samples does not come into question. The Permittee can learn more about these reliability checks and some of the geological and other factors that could influence them by reading Chapter 4 of *Water Quality Data: Analysis and Interpretation* by Arthur W. Hounslow.

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 operator should evaluate the data from waste rock well site: WRDS-B6 to determine if any improvements to the water quality in that area can be made.

