

WATER QUALITY MEMORANDUM Utah Coal Regulatory Program

June 3, 2010

TO: Internal File

THRU: Daron R. Haddock, Permit Supervisor *DRH*

FROM: April A. Abate, Environmental Scientist II *AAA 6-8-2010*

RE: 2009 Fourth Quarter Water Monitoring, Canyon Fuel Company, LLC, SUFCO Mine, C/041/0002, WQ09-4, Task ID #3443

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 as per Table 7-2. 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 during the 4th quarter of 2009. Springs that were not flowing included the locations in Box Canyon and the East Fork of Box Canyon. Other spring locations that reported no flow this quarter included: the spring-fed pool (sample ID 89), Spring 057A, and Spring M-SP02.

Streams

The MRP requires the Permittee to monitor 20 streams during the fourth quarter as per Table 7-2.

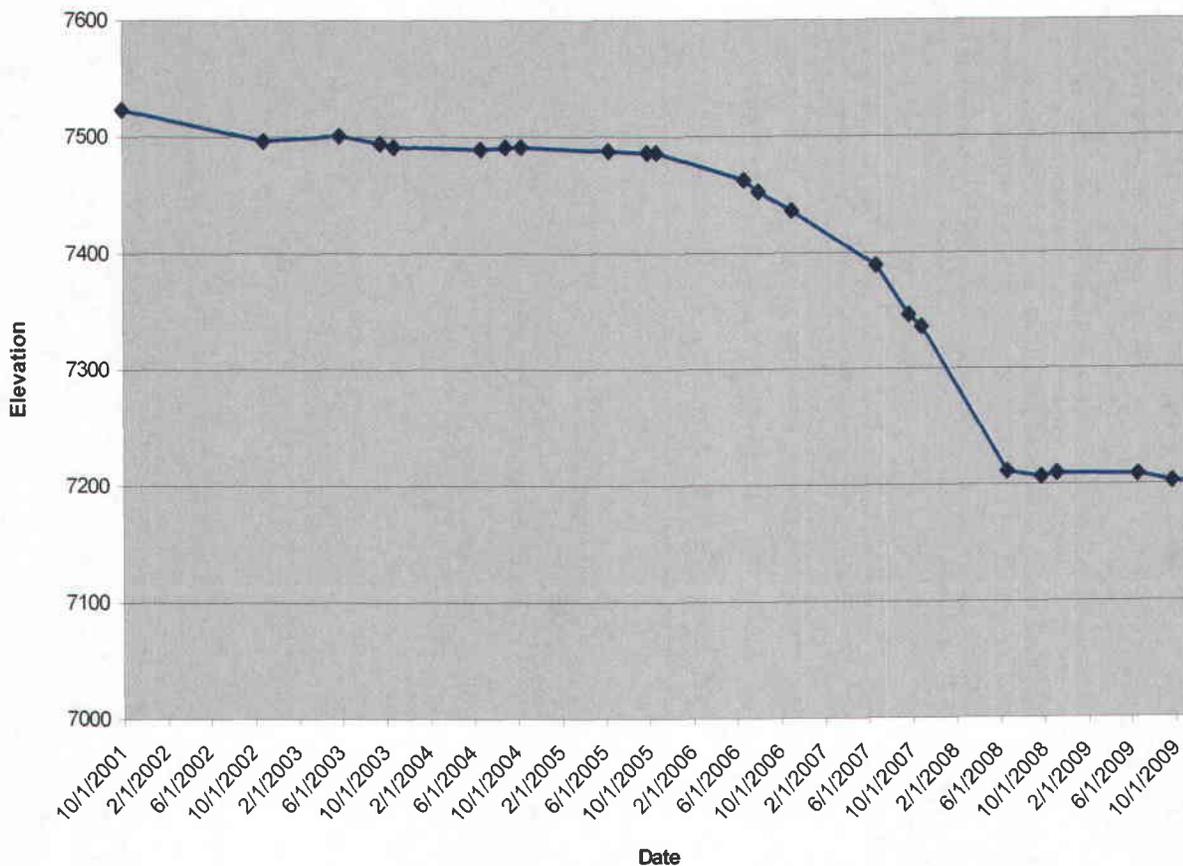
The Permittee submitted all required samples for the stream sites. Flow was not present at stream locations FP-1, FP-2, USFS 109, USFS 110, and PINES 106 at Box Canyon and the East Fork of Box Canyon areas. However, the samples at the confluence of these canyons (Stream samples PINES 407 and PINES 408) did report flow this quarter. In addition, stream sample locations Link-001, M-STR4, PINES 302 did not report flow.

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. Groundwater elevations for well 01-08-1 have been submitted since 2001 monitoring the groundwater in the SITLA Muddy Lease tract. As can be seen in the chart, there was a decline in groundwater elevations of approximately 275 feet evident from the period between October 2005 and June 2008 while this area was being actively mined. Groundwater levels have begun to stabilize but it is not apparent as of yet if groundwater elevations will rebound to pre-mining levels.

Groundwater Elevation for Well 01-8-1



Monitoring data for four additional wells not listed in the MRP associated with the waste rock disposal site are listed in the database include: WRDS-B3, WRDS-B5, WRDS-

B6, WRDS-B8, WRDS-B9. WRDS-B6 and WRDS-B8 were sampled for analytical parameters during the fourth quarter of 2009.

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 003A, 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

In general, there were several field specific conductivity measurements and dissolved oxygen readings that were outside of two standard deviations. A possible cause for this may be that the instrument was malfunctioning or not calibrated properly. For example, fourth quarter stream sample results for SUFCO 006 and SUFCO 007 had the exact same temperature and dissolved oxygen results. Stream sample SUFCO 007 was reported as frozen. Could the colder temperature of the water or ice have an effect on the instrument probes?

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.

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	84
PINES 100	Na/(Na + Cl)	> 50%	48
SUFCO 041	Conductivity/Cations	>90 & < 110	88
	Mg/(Ca + Mg)	< 40 %	44
SUFCO-042	Conductivity/Cations	>90 & < 110	84
	Mg/(Ca + Mg)	< 40 %	46
SUFCO-046	Conductivity/Cations	>90 & < 110	79
SUFCO-47A	Conductivity/Cations	>90 & < 110	81
	Na/(Na + Cl)	> 50%	47
PINES 403	Conductivity/Cations	>90 & < 110	83
	Na/(Na + Cl)	> 50%	49
	Mg/(Ca + Mg)	< 40 %	41
WRDS-B6	Conductivity/Cations	>90 & < 110	75
	TDS/Conductivity	>0.55 - <0.75	0.85
	Na/(Na + Cl)	> 50%	23
	Mg/(Ca + Mg)	< 40 %	47
WRDS-B8	Na/(Na + Cl)	> 50%	41
	Mg/(Ca + Mg)	< 40 %	29

Stream sample PINES 403 in Lower Box Canyon and Waste rock well WRDS-B6 had the most parameters outside of standard values. TDS and conductivity values in WRDS-B6 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 Permittee should evaluate the conductivity, temperature and dissolved oxygen instrument they are using prior to using it in field to insure that proper calibration and quality checks are routinely performed.

As a general comment, the existing water monitoring plan in the MRP contains several outdated references to sampling protocols that were performed in the 1990s. The Division recommends that the water monitoring plan be updated in the near future that is more reflective of current sampling protocols (i.e. addressing the U.S. Forest Service sampling locations in the MRP).