

WATER QUALITY MEMORANDUM

Utah Coal Regulatory Program

December 31, 2013

TO: Internal File

THRU: Steve Christensen, Permit Supervisor



FROM: Ken Hoffman, Hydrologist *KH*

RE: First Quarter of 2013 Water Monitoring, PacifiCorp, Deer Creek Mine.
C/015/0018, Task ID #4273

The Deer Creek Mine monitoring plan is described in Appendix A of Volume 9 of the MRP.

1. **Were data submitted for all of the MRP required sites?** YES NO
2. **Were all required parameters reported for each site?** YES NO
3. **Were any irregularities found in the data?**

Listed parameters were more than two standard deviations from the mean.

Springs YES NO

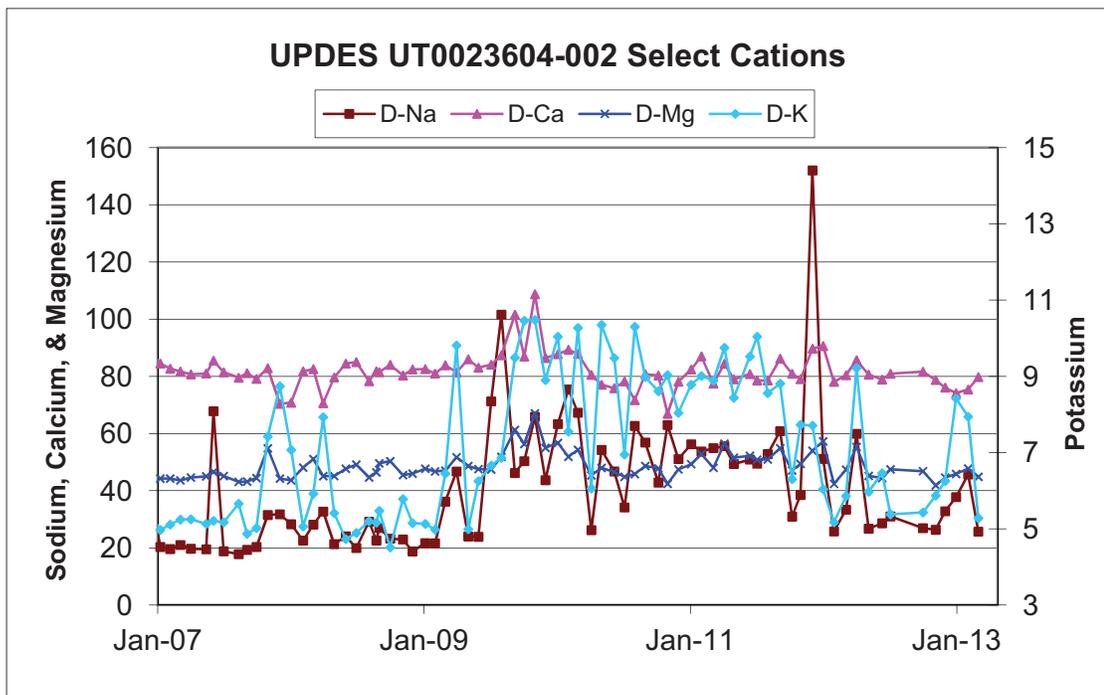
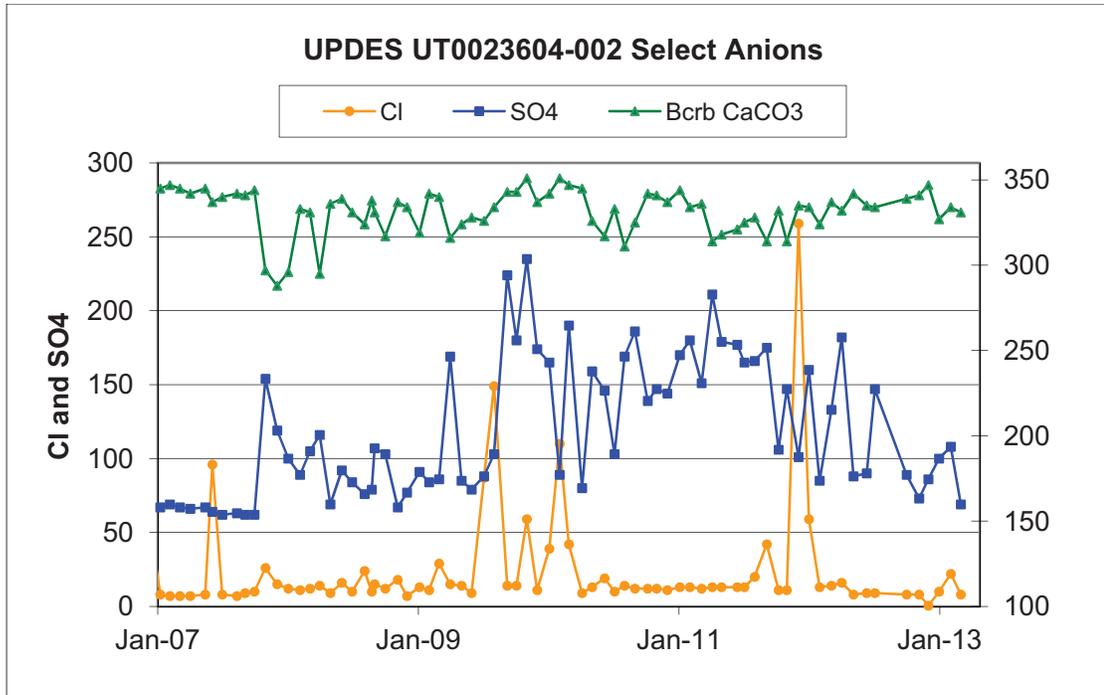
Newua meter-3 March field conductivity

Streams YES NO

DCR04 January, February - flow
DCR06 January, February – flow
HCC01 March – field conductivity

UPDES YES NO

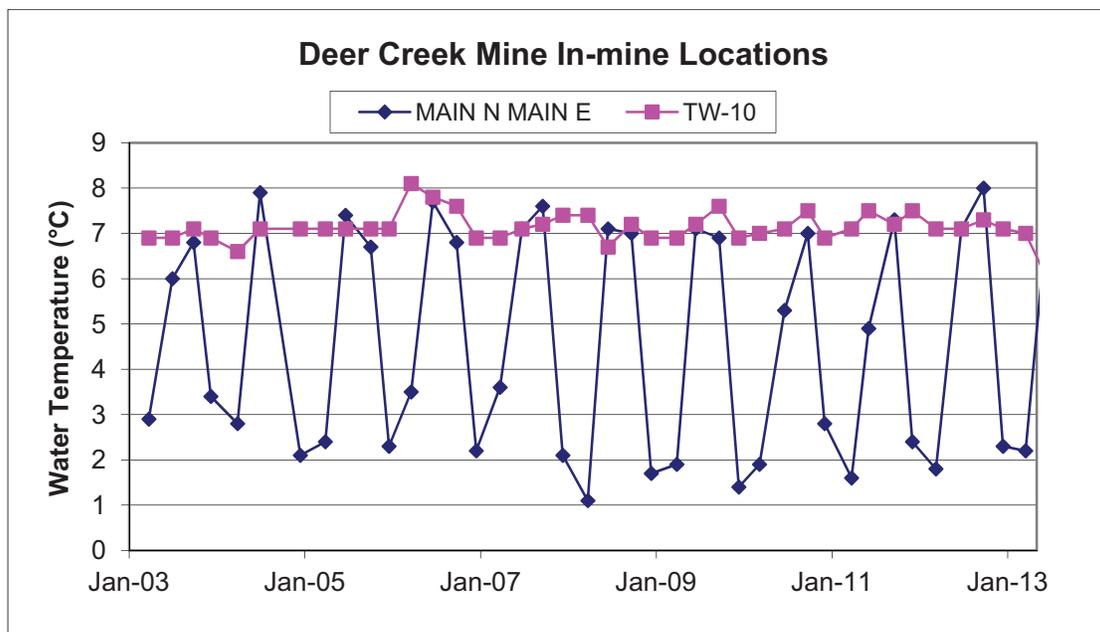
The cation-anion balance was more than two standard deviations from the mean at UPDES-002 during July. Recently, potassium values have frequently been outside two standard deviations from the mean at UT0023604-002, but – as can be seen on the following charts – with the exception of bicarbonate and dissolved potassium, major ion concentrations have tended to fluctuate upwards in recent years.



In-mine

YES NO

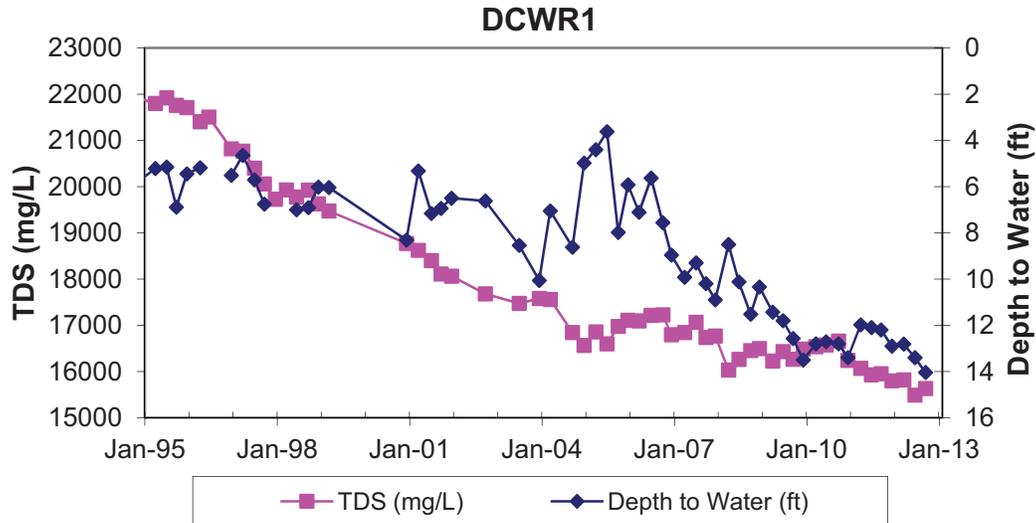
Dissolved sodium was more than two standard deviations from the mean at TW-10 during March. The water temperature at Main North Main East varies seasonally year-after-year (see following chart), indicating that this in-mine source is most likely fed by infiltration of surface water rather than draining surrounding strata. The temperature at TW-10 shows some seasonal variation but it is not as definitive as at Main North Main East.



Wells

YES NO

Although it hasn't been flagged as varying from the mean by more than two standard deviations, water level at DCWR1 has been dropping since 2006 (following a small rise in 2004-2005). TDS was dropping at a similar rate, but now appears to have stabilized. These changes are probably from factors other than disposal of waste rock at this site: a similar drop in water level is seen at WCWR1 at the Cottonwood/Wilberg Mine Waste Rock Disposal Site.



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

Baseline analyses were performed in 2001, 2006 and 2011 and are to be repeated every 5 years. Baseline analyses will next be conducted in 2016.

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

There is no indication of trends or extremes in any of the parameter values. No further action recommended at this time.

6. Does the Mine Operator need to submit more information to fulfill this quarter's monitoring requirements? YES NO

7. Follow-up from last quarter, if necessary.

None.

8. Did the Mine Operator submit all the missing and/or irregular data (datum)?

NA.