

#3835
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WATER QUALITY MEMORANDUM

Utah Coal Regulatory Program

December 14, 2011

TO: Internal File

THRU: Steve Christensen, Permit Supervisor *SCC*

FROM: Ken Hoffman, Environmental Scientist *KH*

RE: 2011 Second Quarter Water Monitoring, PacifiCorp, Deer Creek Mine.
C/015/0018, Task ID #3835

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

Many sites were not accessible during the Second Quarter 2011.

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. An asterisk (*) indicates this is not a parameter specifically required by the MRP. Parameters in bold type were also more than two standard deviations from the mean during the previous quarter.

Streams YES NO

DCR01 May and June: flow; June: dissolved calcium

DCR04 April, May, and June: **flow**

DCR06 April, May, and June: flow

HCC01 June: nitrate

HCC02 June: nitrate

HCC04 June: nitrate

MF-A June: flow, total suspended solids, total iron

MF-B June: flow, total suspended solids, total iron

MFU-03 May and June: flow; June: chloride

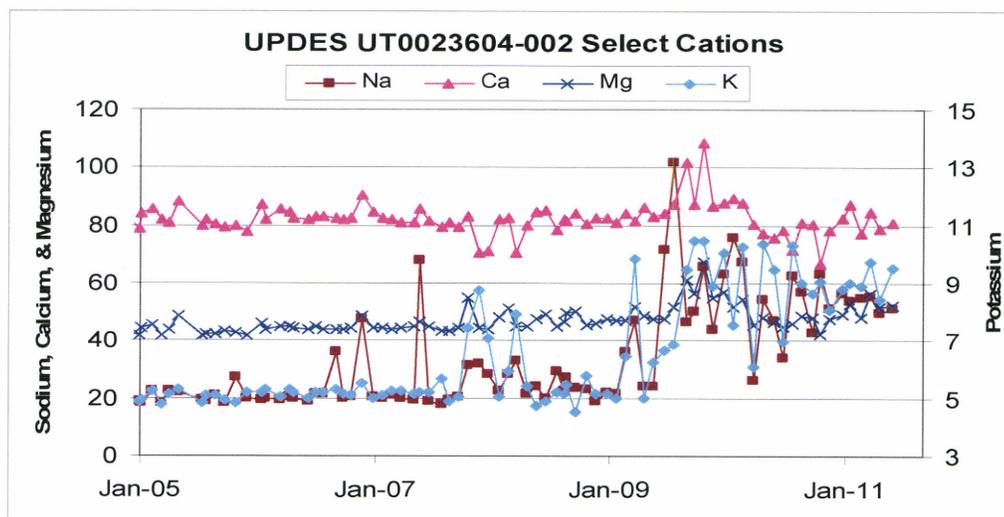
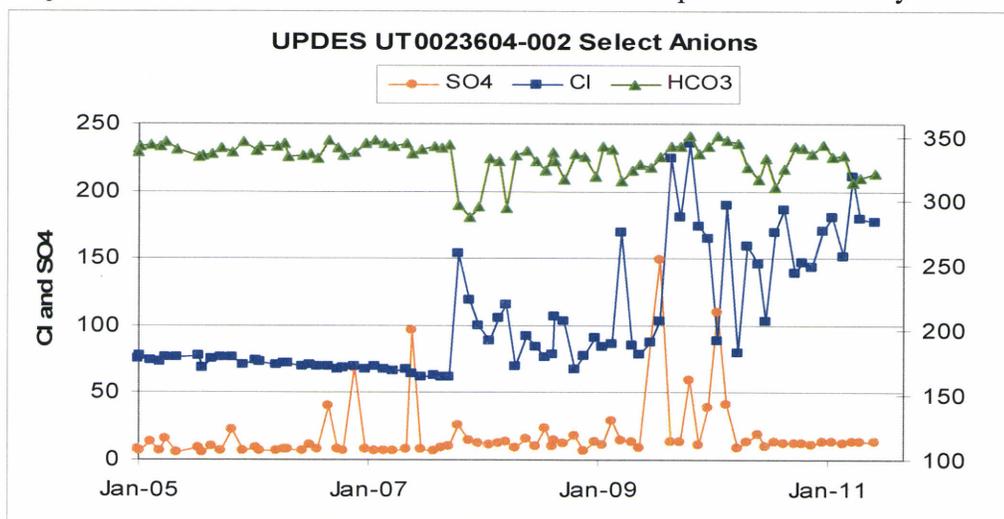
MHC 01 May and June: flow; June field specific conductivity, dissolved calcium, bicarbonate

RCF-1 June: flow, total suspended solids, total iron
 RCF3 June: flow, pH, total suspended solids.
 RCLF1 June: flow
 RCLF2 June: flow
 RCW4 June: flow, total suspended solids, dissolved sodium, bicarbonate, total alkalinity, total iron

UPDES

YES NO

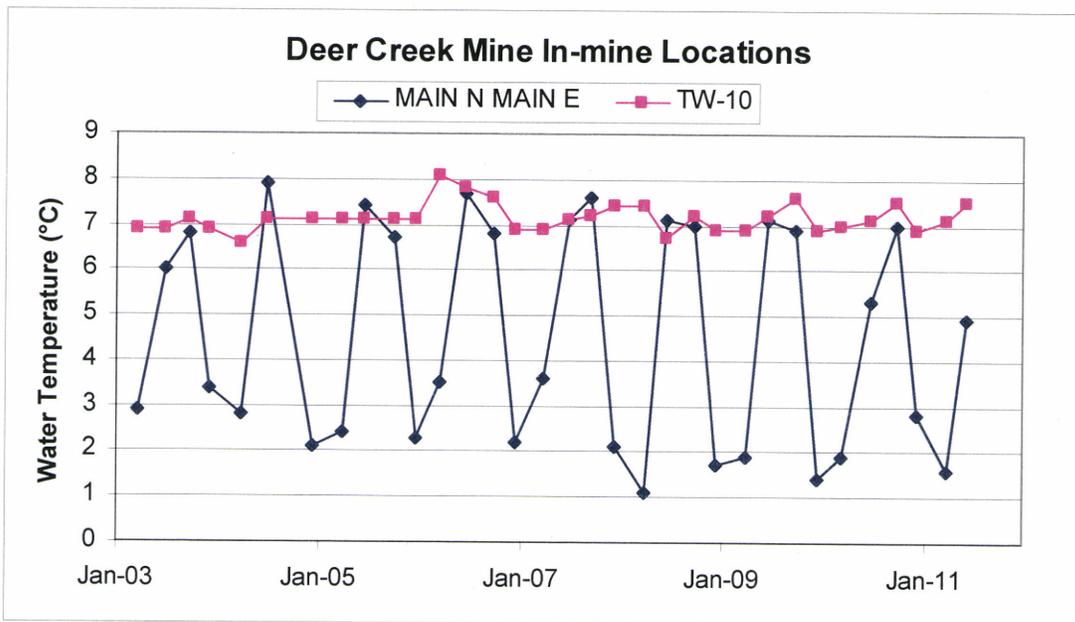
Recently, potassium values have frequently been outside two standard deviations from the mean at UT0023604-002, but – as can be seen on the following charts – with the exception of bicarbonate, major ion concentrations have tended to fluctuated upwards in recent years.



In-mine

YES NO

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.



Springs

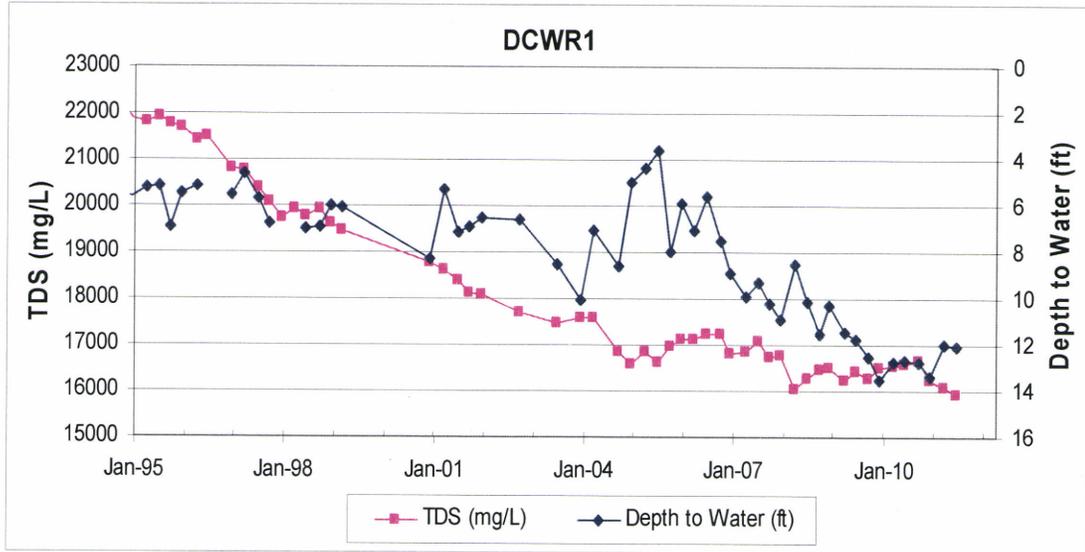
YES NO

Wells

YES NO

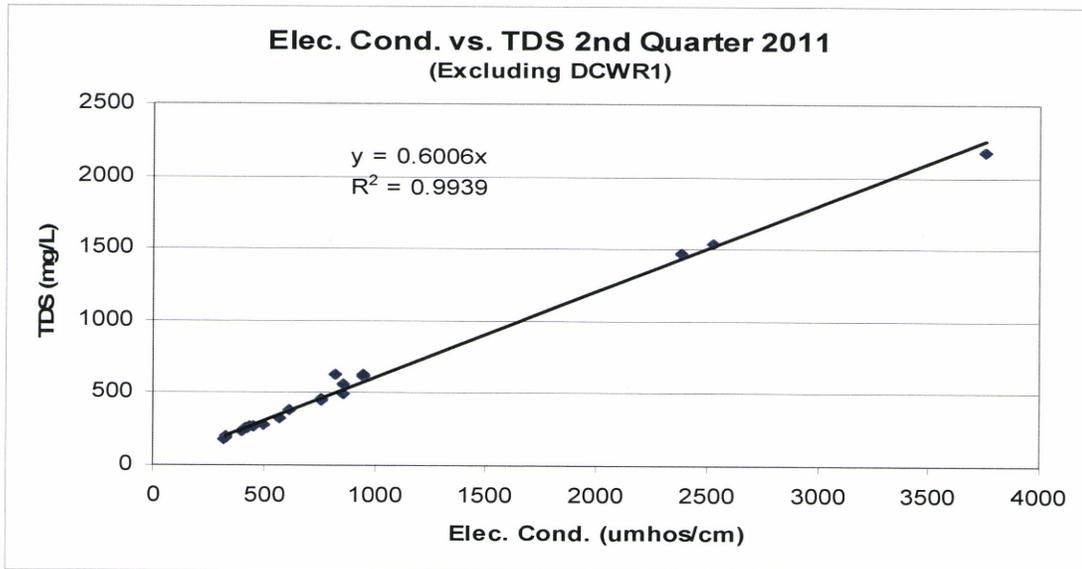
CCCW-1A: depth to water

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.



TDS/field electric conductivity ratios – all sites

The TDS/field electric conductivity ratio typically falls between 0.55 and 0.76 for dissolved solids concentrations found in natural waters. As the following chart shows, data for these two parameters submitted for the Second Quarter 2011 at the Deer Creek Mine generally result in a ratio that falls within this range: DCWR1 is not included in the trendline calculation.



DCWR1 (TDS/field electric conductivity = 0.876) lies outside the upper end of the range. The comparison of the 3rd and 4th Quarter 2010 and 1st and 2nd Quarter 2011 values in the following table indicates DCWR1 has consistently high values for the TDS/ field electric conductivity ratio.

| | Quarter | | | | | |
|-------|----------|----------|----------|--------------------------|------------|----------|
| | 3rd 2010 | 4th 2010 | 1st 2011 | 2nd 2011 | | |
| | TDS/ EC. | TDS/ EC. | TDS/ EC. | EC (field) μ mhos/cm | TDS (mg/L) | TDS/ EC. |
| DCWR1 | 0.968 | 0.95 | 0.922 | 18180 | 15930 | 0.876 |

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

Baseline analyses were performed in 2001 and 2006 and are to be repeated every 5 years. Baseline analyses are currently being conducted in 2011.

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.