

#4172
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WATER QUALITY MEMORANDUM

Utah Coal Regulatory Program

March 11, 2013

TO: Internal File

THRU: Steve Christensen, Permit Supervisor *SKC*

FROM: Ken Hoffman, Hydrologist *KH*

RE: Third Quarter of 2012 Water Monitoring, PacifiCorp, Deer Creek Mine.
C/015/0018, Task ID #4172

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

- 79-2 July - dissolved calcium, dissolved magnesium
- 79-28 July – dissolved calcium, dissolved magnesium, bicarbonate
- 79-29 July – bicarbonate
- 79-35 July – bicarbonate
- 80-48 July – water temperature
- 80-50 July – water temperature, dissolved calcium, dissolved magnesium
- 84-56 July – dissolved magnesium
- 89-60 July – dissolved calcium
- 89-67 July – water temperature
- 89-68 July – water temperature
- 91-72 July – bicarbonate
- Burnt Tree Spring July – dissolved magnesium
- EM Pond July – dissolved calcium, dissolved magnesium, total hardness
- Grant Spring July – conductivity, dissolved calcium, dissolved magnesium, total hardness
- MF 10 – July – dissolved calcium, cation-anion balance
- MF 213 July – conductivity, dissolved calcium, dissolved magnesium, total hardness

MF 219 July – water temperature, conductivity
MF 7 July – conductivity, dissolved sodium
MFR-10 July – conductivity
RR 15 July – conductivity
RR 23A July – conductivity, bicarbonate, total alkalinity
SP1-26 July – conductivity
Ted’s Tub July – dissolved calcium, dissolved magnesium, dissolved potassium
UJV 101 July – water temperature
UJV 213 July – dissolved calcium, total hardness, total dissolved solids

Streams YES NO

DCR04 July - flow
DCR06 July – flow
DCWR1 September – pH
RCF-1 September – cation-anion balance

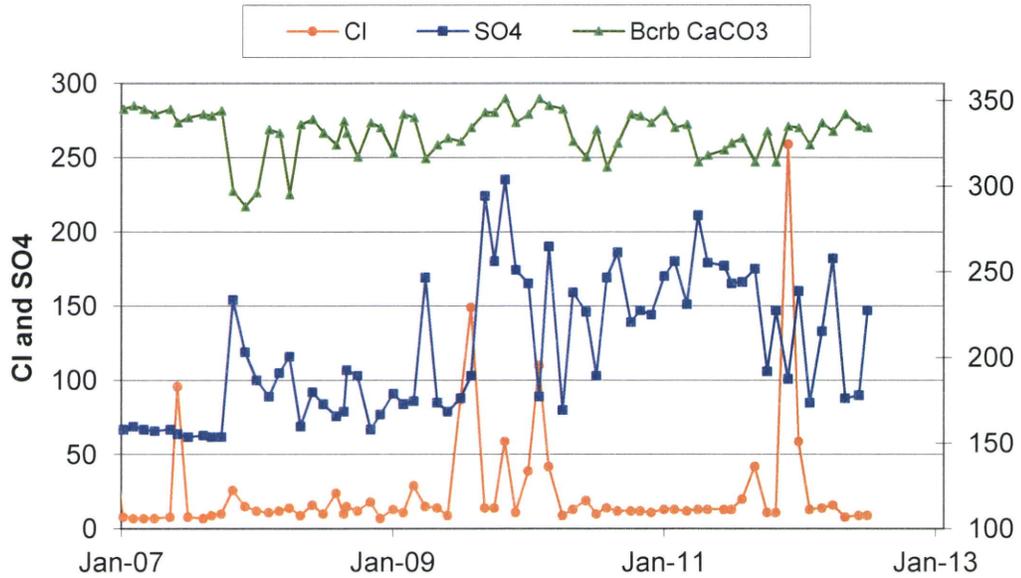
UPDES YES NO

During August and September 2012 no flow was present at UPDES-002 because the flow was being diverted to the Pacific Corp Power Plant. The power plant was concerned about possible poor water quality from Huntington Creek due to the 2012 Seeley Fire.

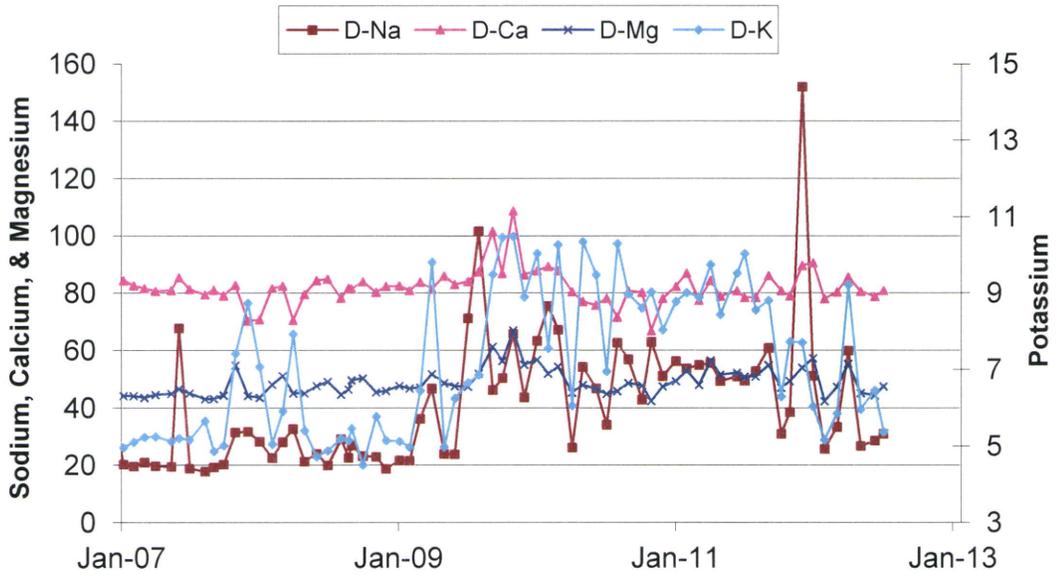
UPDES-002 July – cation-anion balance

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 fluctuated upwards in recent years

UPDES UT0023604-002 Select Anions



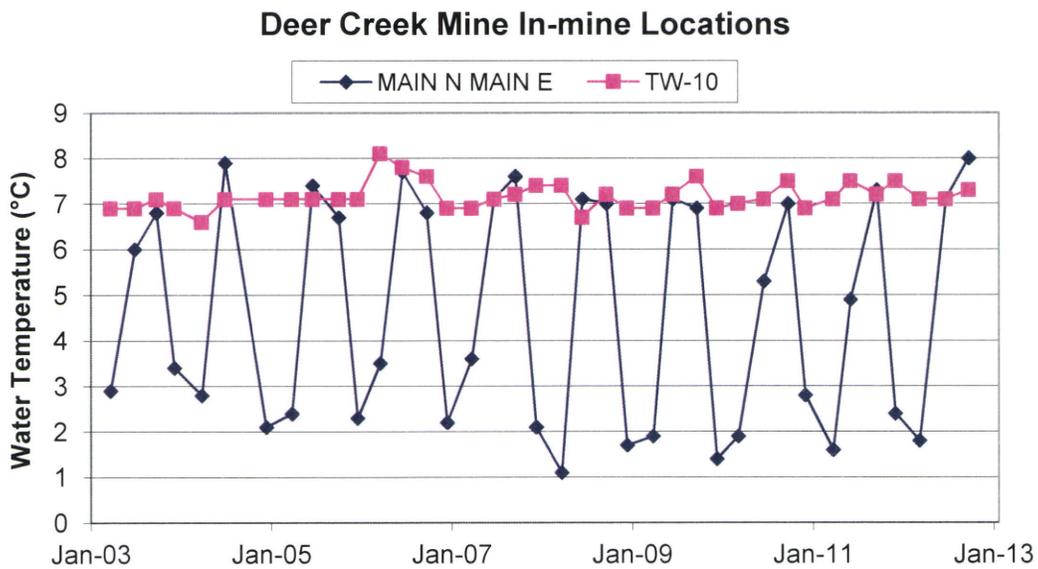
UPDES UT0023604-002 Select Cations



In-mine

YES NO

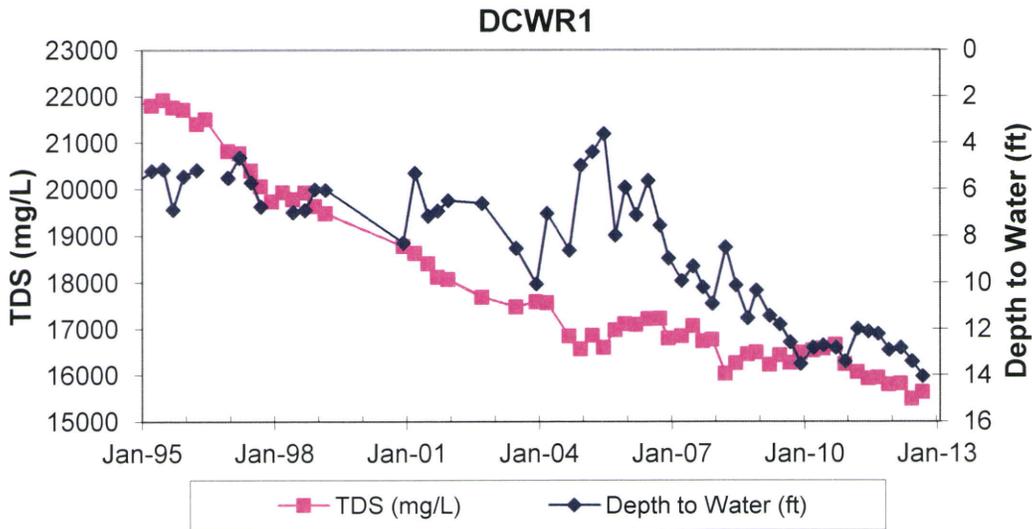
The water temperature at Main North Main East varies seasonally year-after-year (see following chart), indicating that this in-mine source is most likely fed by infiltration of surface water rather than draining surrounding strata. The temperature at TW-10 shows some seasonal variation but it is not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



Wells

YES NO

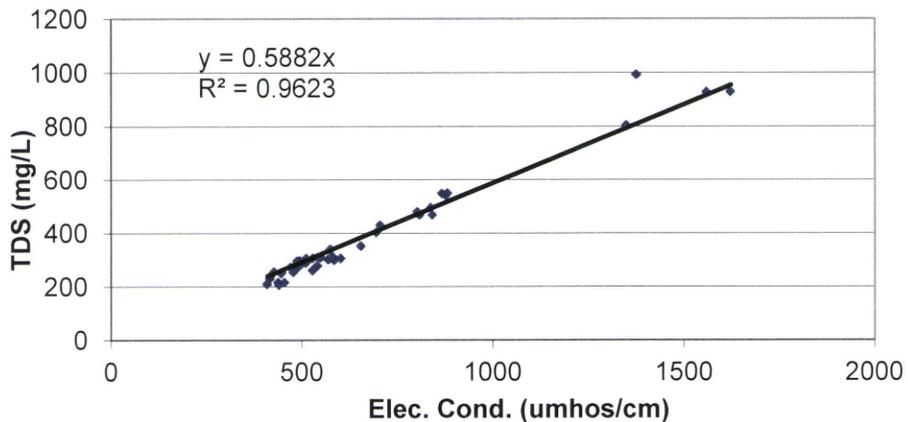
Although it hasn't been flagged as varying from the mean by more than two standard deviations, water level at DCWR1 has been dropping since 2006 (following a small rise in 2004-2005). TDS was dropping at a similar rate, but now appears to have stabilized. These changes are probably from factors other 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.



TDS/field electric conductivity ratios – all sites

The TDS/field electric conductivity ratio typically falls between 0.52 and 0.76 for dissolved solids concentrations found in natural waters. As the following chart shows, data for these two parameters submitted for the Third Quarter of 2012 at the Deer Creek Mine generally result in a ratio that falls within this range: DCWR1 is not included in the trendline calculation.

**Elec. Cond. vs. TDS 3rd Quarter of 2012
 (Excluding DCWR1)**



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.