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WATER QUALITY MEMORANDUM
Utah Coal Regulatory Program

December 7, 2011

TO: Internal File

THRU: Steve Christensen, Permit Supervisor SC

FROM: Ken Hoffman, Environmental Scientist KH

RE: 2011 First Quarter Water Monitoring, PacifiCorp, Deer Creek Mine. C/015/0018, Task ID #3749

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 First 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 ☐

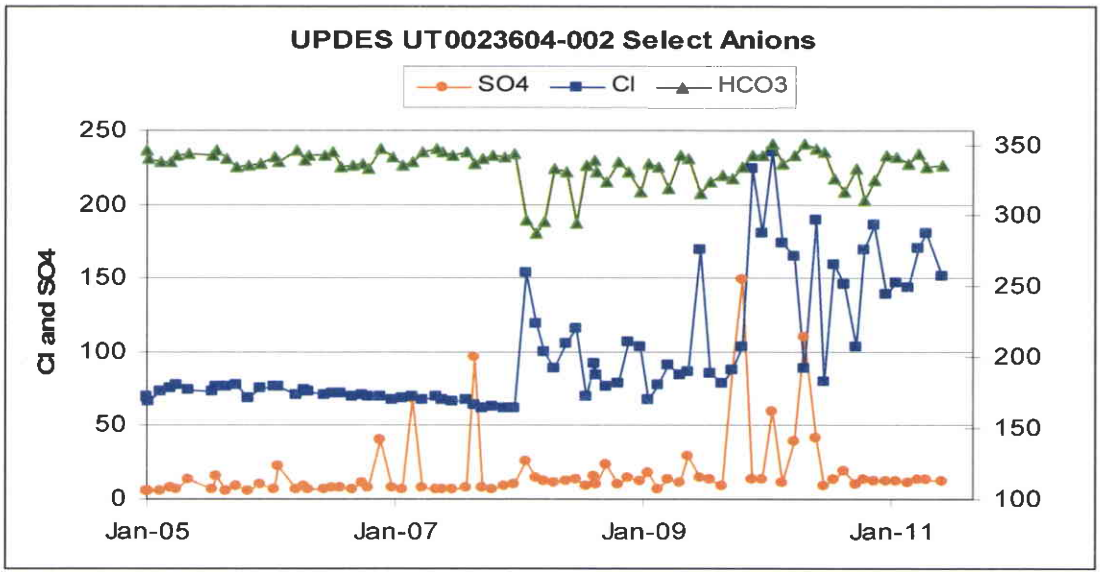
DCR04 January and February: flow
DCR06 January: flow
DCWR1 March; cation-anion balance
HCC02 March: field specific conductivity, potassium, sodium, total dissolved solids, and total anions*;
RCW4 March: field specific conductivity

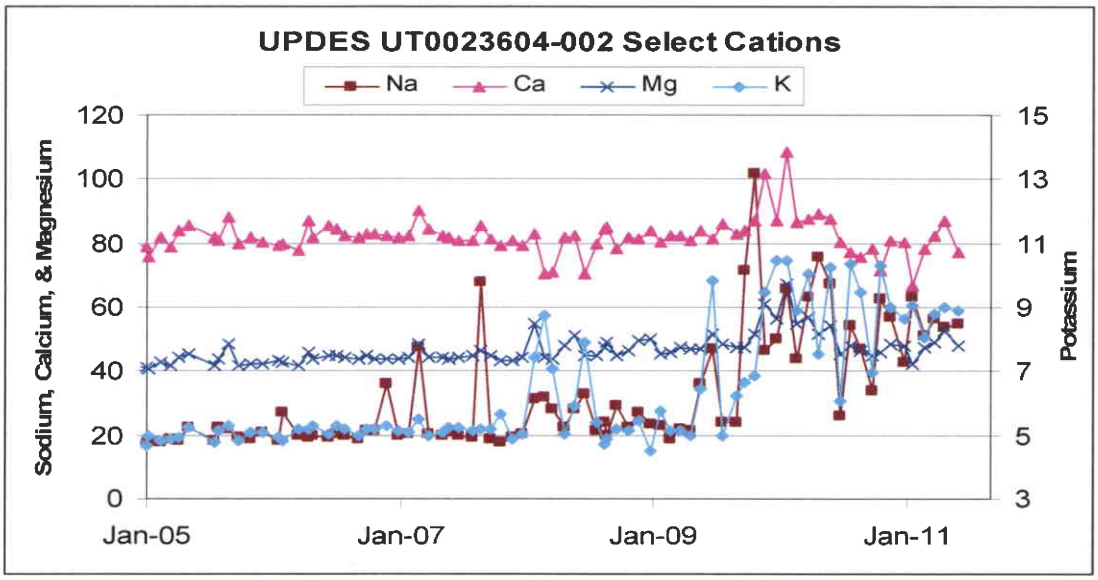
UPDES YES ☒ NO ☐

UT0023604-001 January: field specific conductivity, potassium, sodium, chloride, laboratory specific conductivity*, total dissolved solids, total cation*, total anion*;

UT0023604-001 February: potassium;

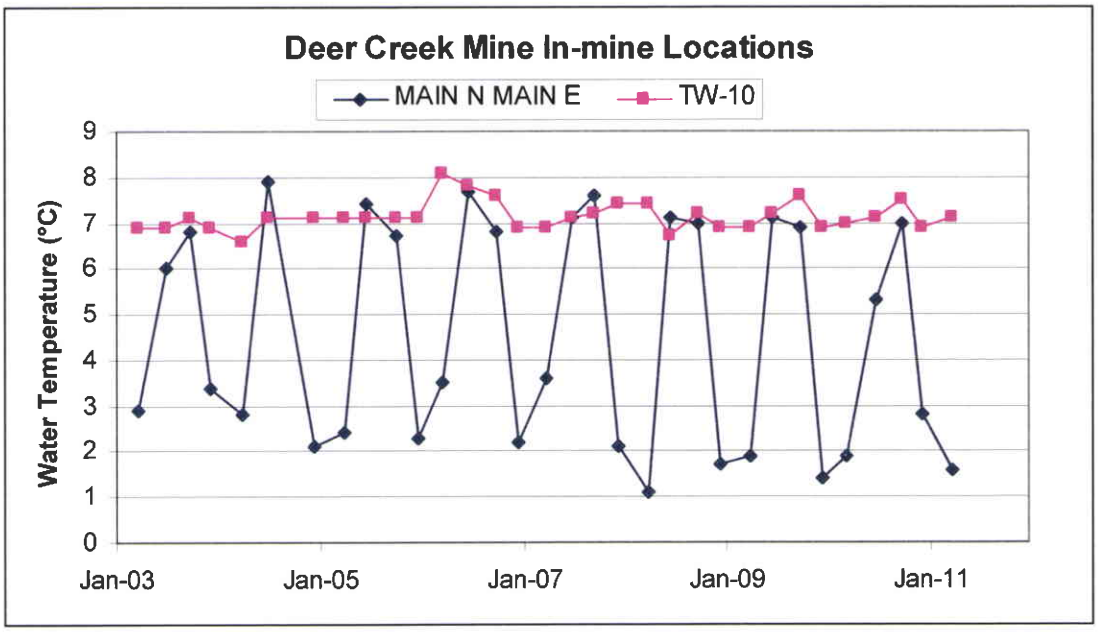
Recently, potassium values have frequently been outside two standard deviations from the mean at UT0023604-002, but – as can be seen on the following charts – with the exception of bicarbonate, major ion concentrations have tended to fluctuated upwards in recent years.





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.

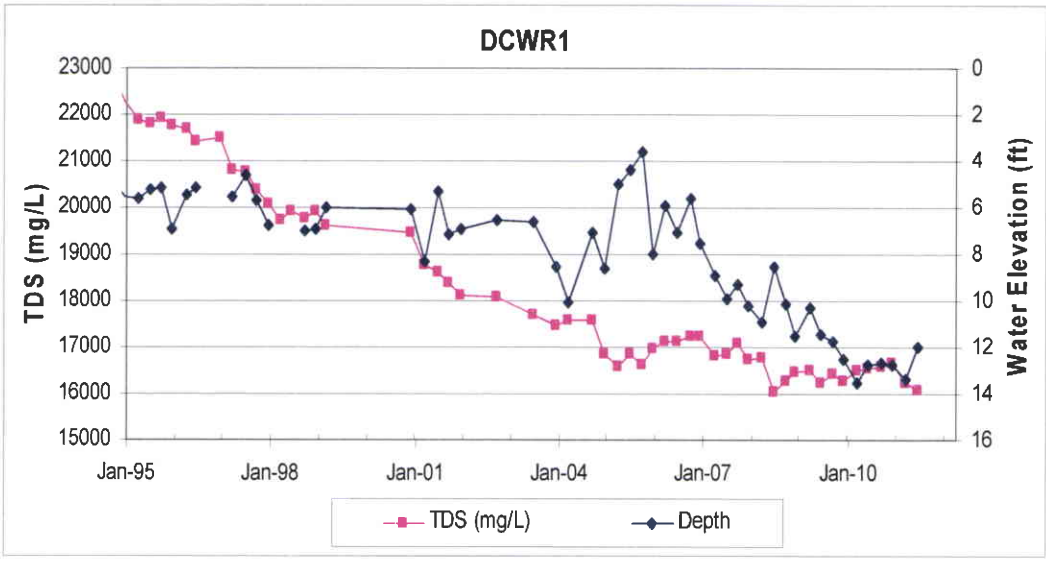


Springs YES ☒ NO ☐

Mine Site 4: chloride

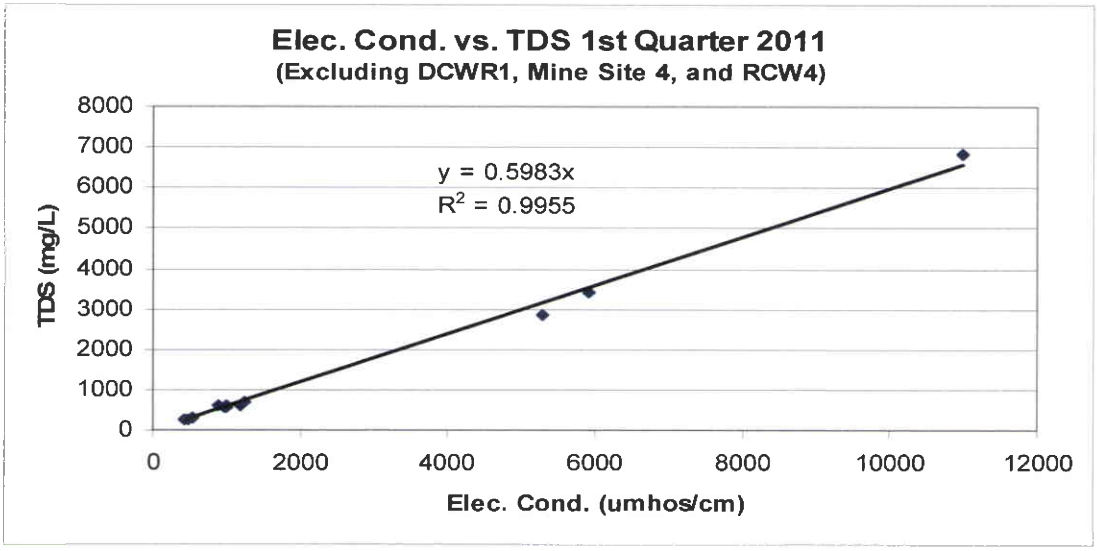
Wells YES ☐ NO ☒

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 0.55 and 0.76 for dissolved solids concentrations found in natural waters. As the following chart shows, data for these two parameters submitted for the First Quarter 2011 at the Deer Creek Mine generally result in a ratio that falls within this range: DCWR1, Mine Site 4, and RCW4 are not included in the trendline calculation.



DCWR1 (TDS/field electric conductivity = 0.922), Mine Site 4 (0.921), and RCW4 (0.727) lie outside the upper end of the range. The comparison of the 2nd, 3rd, and 4th Quarter 2010 and 1st Quarter 2011 values in the following table indicate Mine Site 4 and DCWR1 have consistently high values for the TDS/ field electric conductivity ratio.

	Quarter					
	2nd 2010	3rd 2010	4th 2010	1st 2011		
	TDS/ EC.	TDS/ EC.	TDS/ EC.	EC (field) µmhos/ cm	TDS (mg/L)	TDS/ EC.
RCW4	0.635	0.763	0.773	1574	1145	0.727
MINE SITE 4	0.898	0.87	0.973	2660	2449	0.921
DCWR1	0.943	0.968	0.95	17430	16069	0.922

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.