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WATER QUALITY MEMORANDUM

Utah Coal Regulatory Program

June 29, 2011

TO: Internal File

THRU: Jim Smith, Permit Supervisor DS 06/30/11

FROM: Steve Christensen, Environmental Scientist SIC

RE: 2010 Fourth Quarter Water Monitoring, West Ridge Resources, West Ridge Mine, Task ID #3673

The West Ridge Mine is currently operational in the Book Cliff Mountain range of Carbon County, UT. Water monitoring data is submitted quarterly to the Division EDI database. Beginning on page 7-34 of the approved Mining and Reclamation Plan (MRP), water monitoring protocols and sampling requirements are provided for surface water, ground water, monitoring wells and UPDES outfalls in Tables 7-1, 7-2, 7-3 and 7-4 respectively.

1. Was data submitted for all of the MRP required sites? YES ☒ NO ☐

Springs

The approved MRP outlines the monitoring of 10 springs. Four of the springs (SP-12, SP-13, SP-15 and SP-16) discharge from the lower slopes of West Ridge in Whitmore Canyon. Two springs (WR-1 and WR-2) discharge from the upper slope of West Ridge in Whitmore Canyon. One spring (SP-8) discharges in the upper drainage of C Canyon. Hanging Rock Spring (S-80) is located near the northwest corner of the permit area and discharges from the east slopes of Whitmore Canyon. Spring 101 monitors Little Spring at the bottom of West Ridge. Spring 102 is located within Spring Canyon.

Data was submitted for all ten of the spring monitoring sites. Three spring monitoring sites (S-80, SP-15 and WR-2) did produce a measurable flow this quarter.

Streams

The approved MRP outlines the monitoring of 12 stream sites. Grassy Trail Creek is the only perennial stream in the permit and adjacent areas. Operational sampling is required quarterly for six stream sites (ST-3, ST-8, ST-9, ST-10, ST-13 and ST-15). Sites ST-11 and ST-

12 were added to the water-monitoring program based upon field inspections conducted in 2005. The field inspections were conducted as part of a proposed lease expansion by the Permittee. At the time of the inspections, the Bear Canyon drainage had exhibited measurable flow. As a precaution, sites ST-11 and ST-12 were established within that drainage. Since that time (summer of 2005) neither site has produced appreciable/measurable flow. However, the sites remain as part of the surface water monitoring program and are inspected quarterly.

No observable flow was reported for stream monitoring sites ST-3, ST-6A, ST-7, ST-10, ST-11, ST-13 and ST-15. Stream monitoring site ST-12 could not be accessed due to snow conditions. Flows were obtained and data collected for stream monitoring sites ST-5, ST-6, ST-8 and ST-9.

Wells

Quarterly operational sampling is required for one groundwater-monitoring well (Site DH 86-2).

Monitoring well DH 86-2 was sampled during this quarter.

UPDES

Operational sampling is required monthly for two active UPDES sites (Permit # UT0025640). Site D001 is the mine sites primary sediment pond discharge to the ephemeral 'C' Canyon drainage. Site D002 is the mine-water discharge to the ephemeral 'C' Canyon drainage. Specific limitations and self-monitoring requirements as outlined in the UPDES permit are presented in the table below:

Effluent Characteristics	Effluent Limitations
Flow, MGD (million gallons per day)	1.0
Total Suspended Solids (TSS), ppm	70
Total Iron, ppm	1.3
Oil & Grease, ppm	10
Total Dissolved Solids (TDS), ppm	2,000
pH	9

Data was submitted for UPDES Outfalls 001 and 002.

2. Were all required parameters reported for each site? YES ☒ NO ☐

Surface Water Monitoring Sites: All required parameters were reported for each of the surface water monitoring sites that produced a measurable flow and were accessible.

Groundwater and Well Monitoring Sites: All required parameters were reported for the spring and well monitoring sites.

UPDES: All required water quality parameters were reported for Outfalls 001 and 002.

3. Were any irregularities found in the data? YES ☒ NO ☐

Surface Water Monitoring Sites-

Of the 12 surface water monitoring sites, ST-5, ST-6, ST-8 and ST-9 were the only ones that produced a measurable flow.

ST-5- Flow values at monitoring site ST-5 have been historically erratic. The primary source of flow at this ephemeral drainage monitoring site is the mine-water discharge and as a result, is subject to change as mining activity is altered underground. The reported flow at this site has been increasing steadily. Flow values have been outside of two standard deviations since 1st quarter 2010. As the flow at this site is generated primarily from the mine-water discharge, particular attention has been paid to the TSS and T-Fe values.

The reported TSS value for site ST-5 was <5 ppm which is significantly less than the concentration reported the previous quarter (16 ppm). T-Fe values continue to remain well below the UPDES limit of 1.3. The T-Fe value for this quarter was reported as 0.57 ppm.

ST-3- An increase in TDS and its associated components were reported the previous quarter. The elevated concentrations will be closely monitored in subsequent quarters to determine if a trend is emerging. No observable flow was reported for this quarter.

ST-8- A decrease in carbonate was reported last quarter. The reported value was 6 ppm. The carbonate concentration increased this quarter to a more representative concentration based on the data set (19 ppm).

ST-9- Elevated concentrations of SO4, Conductivity, Total Hardness and Total Cations were reported for this stream monitoring site. Continued monitoring will be conducted to

determine if a trend is emerging.

Groundwater Monitoring Sites-

SP-102- Spring monitoring site SP-102 has reported elevated concentrations/values for dissolved for TDS and its associated components for the 3rd consecutive quarter.

SP-12- Spring monitoring site SP-12 continues to report elevated concentrations for TDS and its associated components (D-Ca, D-Mg, D-Na, SO4, D-Ca). Elevated TDS concentrations have been reported at this site for the last 6 quarters with the exception of 1st quarter 2010 (no access due to snow conditions).

SP-13- Spring monitoring site SP-13 reported elevated concentrations for D-Ca, D-Na, T-Alk., T-hdns., T-Cats last quarter. The reported D-Na concentration for this quarter is still elevated, however the other parameters have returned to within normal range.

SP-8- Spring monitoring site SP-8 reported elevated concentrations of D-Na, T-Alk and T-Cats the 2nd quarter of 2010. Elevated concentrations for D-Mg and T-Hardness were reported the last quarter. Elevated concentrations of D-Mg and T-Alk were reported for this quarter.

UPDES Sites- (UPDES Permit #UT0025640)

Site D001- UPDES outfall D001 (primary sediment pond at mine site) did not report a discharge this quarter.

Site D002- UPDES Outfall 002 water quality data was obtained three times this quarter. All of the reported concentrations for TSS and TDS were below the compliance limits as established by the UPDES discharge permit. However, the October sample for T-Fe was 1.11 ppm (just under the 1.3 ppm standard established by the UPDES permit). Additionally, reported mine water discharge volumes continue to increase. A mine water discharge value of 1,428 gpm was reported for December sampling event. The 1,428 gpm value represents the highest recorded flow volume since the Permittee began measuring in 2001.

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

On page 7-35 of the approved MRP, the Permittee commits to collecting baseline samples "from each spring in the monitoring program during the low flow (fall) sampling and from each stream monitoring sites during low flow every five years beginning with the first mid-term review."

Baseline sampling of ground and surface water sites will be required during the 3rd quarter of 2011.

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

Continue to monitor the data irregularities cited above for any trends.

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. YES ☐ NO ☒

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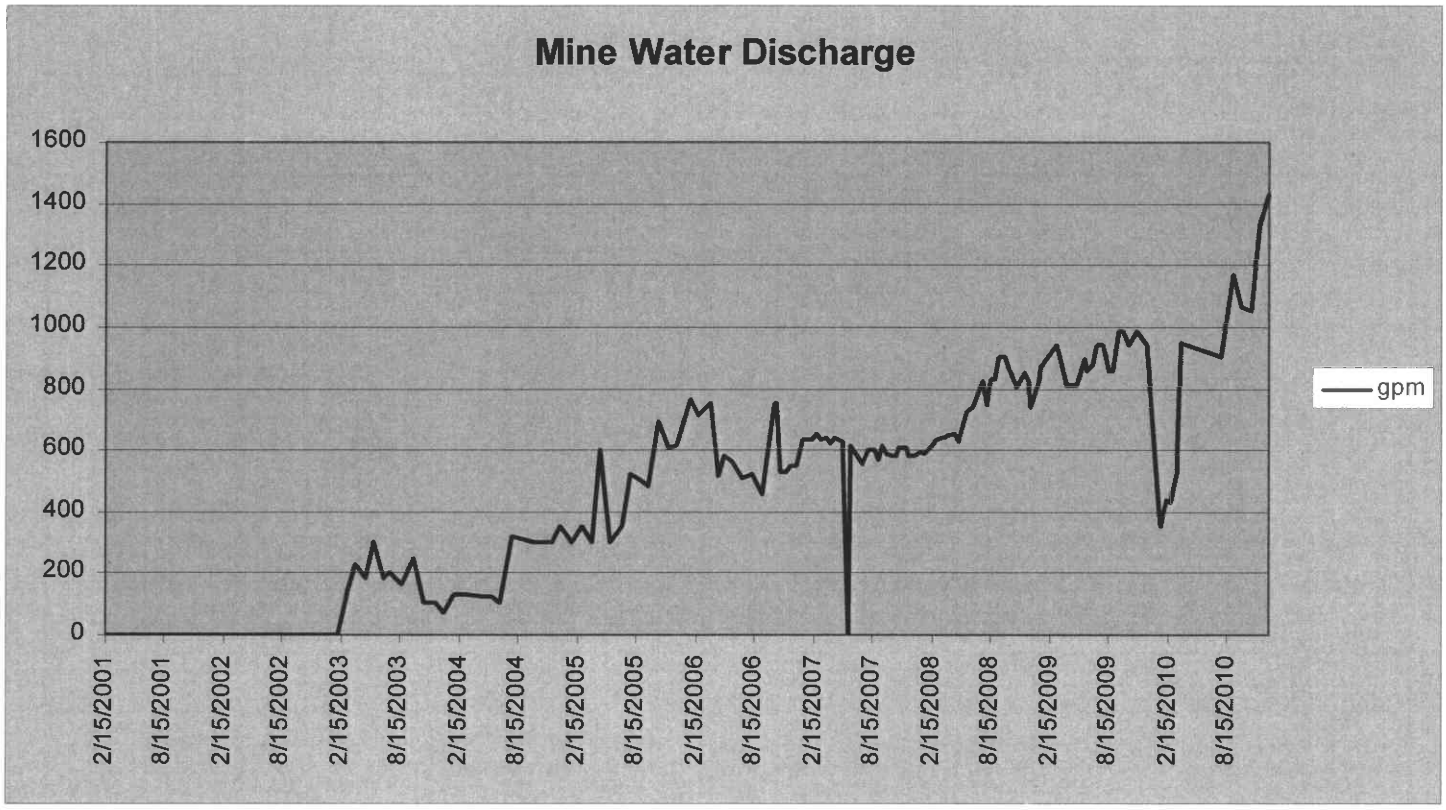
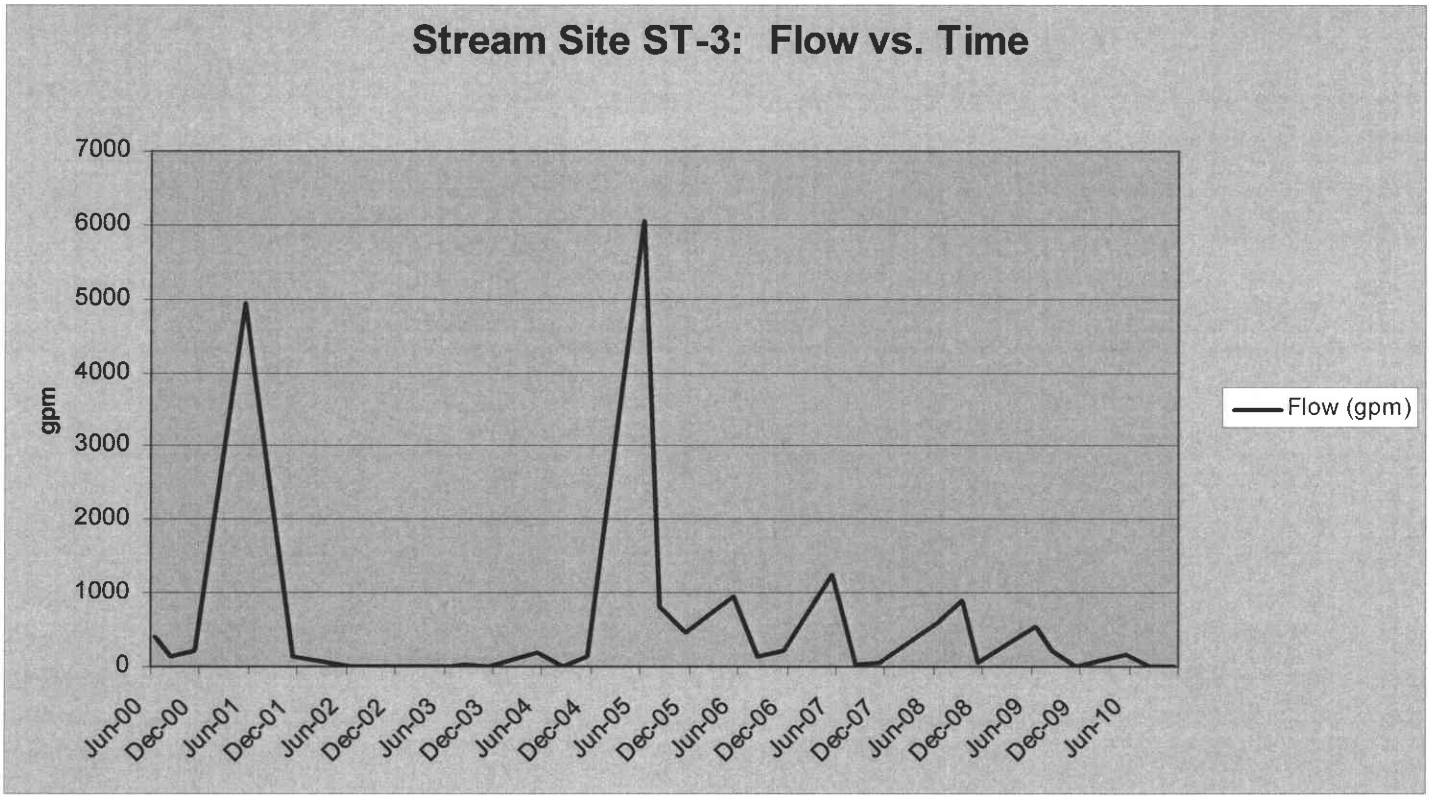
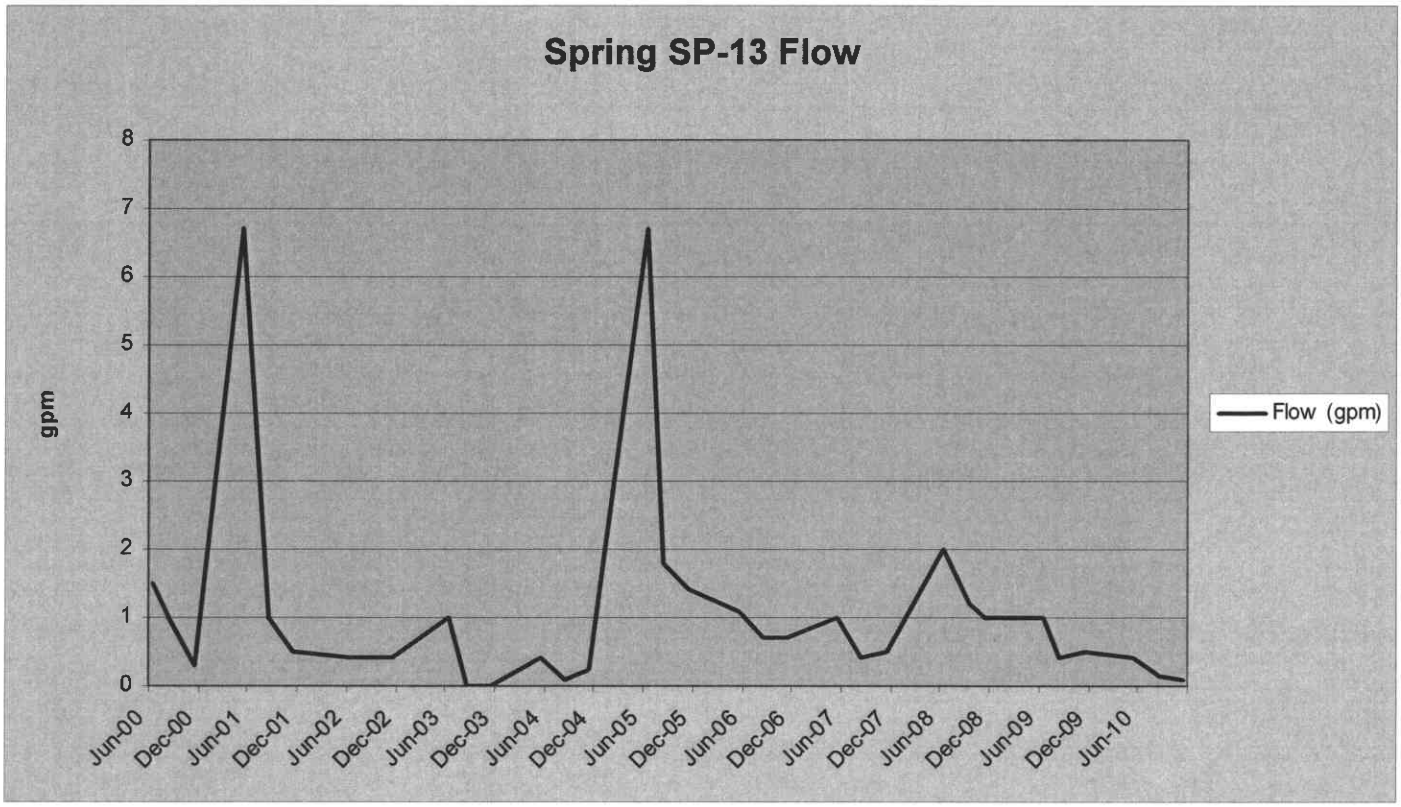
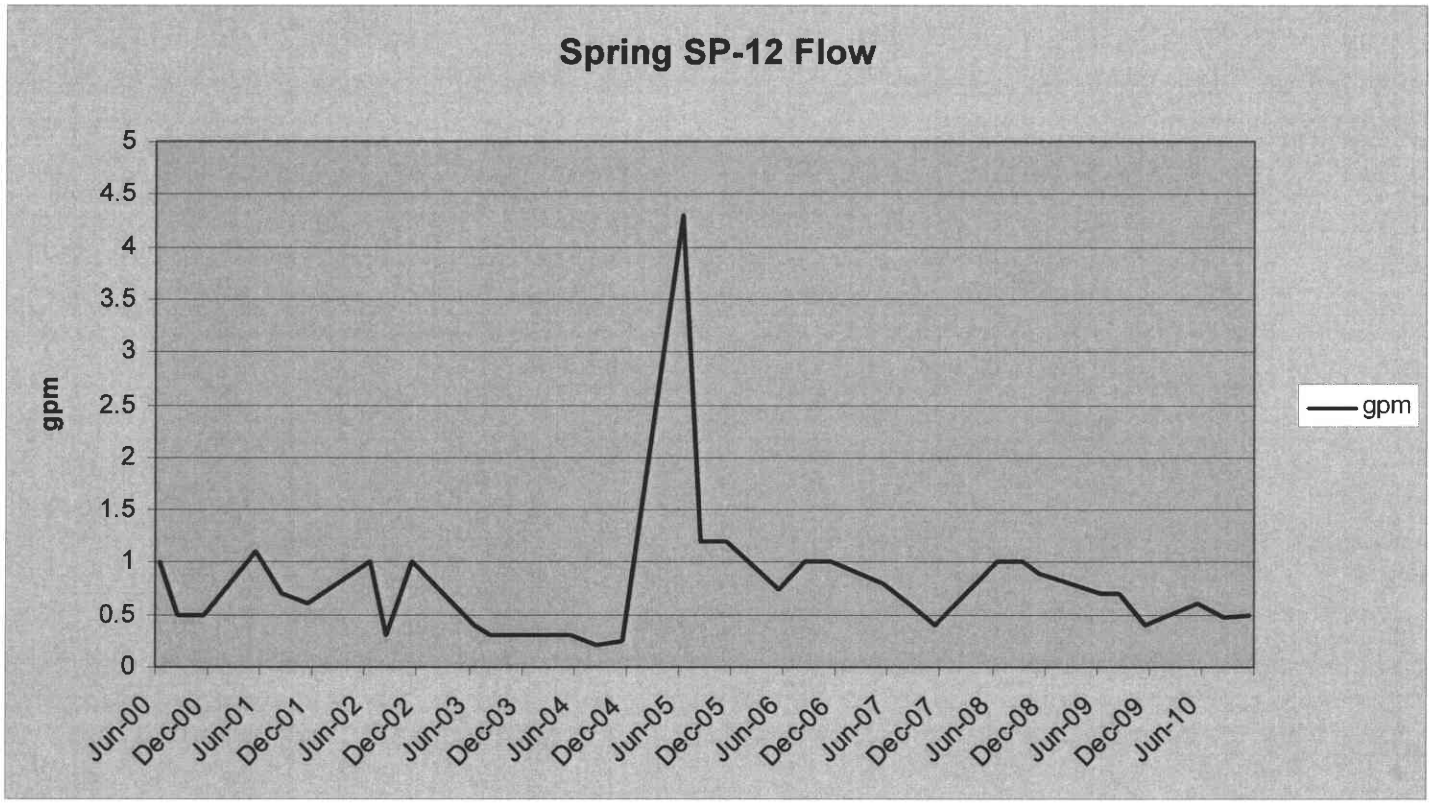

Mine Water Discharge
1600
1400
1200
1000
800
600
400
200
0
2/15/2001
8/15/2001
2/15/2002
8/15/2002
2/15/2003
8/15/2003
2/15/2004
8/15/2004
2/15/2005
8/15/2005
2/15/2006
8/15/2006
2/15/2007
8/15/2007
2/15/2008
8/15/2008
2/15/2009
8/15/2009
2/15/2010
8/15/2010
gpm


Stream Site ST-3: Flow vs. Time
gpm
7000
6000
5000
4000
3000
2000
1000
0
Jun-00
Dec-00
Jun-01
Dec-01
Jun-02
Dec-02
Jun-03
Dec-03
Jun-04
Dec-04
Jun-05
Dec-05
Jun-06
Dec-06
Jun-07
Dec-07
Jun-08
Dec-08
Jun-09
Dec-09
Jun-10
Flow (gpm)


Spring SP-13 Flow
gpm
8
7
6
5
4
3
2
1
0
Jun-00
Dec-00
Jun-01
Dec-01
Jun-02
Dec-02
Jun-03
Dec-03
Jun-04
Dec-04
Jun-05
Dec-05
Jun-06
Dec-06
Jun-07
Dec-07
Jun-08
Dec-08
Jun-09
Dec-09
Jun-10
Flow (gpm)


Spring SP-12 Flow
gpm
5
4.5
4
3.5
3
2.5
2
1.5
1
0.5
0
Jun-00
Dec-00
Jun-01
Dec-01
Jun-02
Dec-02
Jun-03
Dec-03
Jun-04
Dec-04
Jun-05
Dec-05
Jun-06
Dec-06
Jun-07
Dec-07
Jun-08
Dec-08
Jun-09
Dec-09
Jun-10
gpm