

WATER QUALITY MEMORANDUM

Utah Coal Regulatory Program

September 29, 2015

TO: Internal File

THRU: Steve Christensen, Permit Supervisor 

FROM: Keenan Storrar, Hydrologist 

RE: First Quarter of 2015 Water Monitoring, Alton Coal Development LLC, Coal Hollow, C/025/0005, Task ID #4829

The Coal Hollow mine is an active surface mine. The permit application was approved on October 15, 2009 and a Permit was issued to Alton Coal Development, LLC (ACD) on November 8, 2010. Mining activity commenced in November 2010.

The water monitoring program for the Coal Hollow mine is described in Section 731.200 of the MRP. Water monitoring locations are listed in Table 7-5 and shown on Drawing 7-10. Monitoring protocols are described in Table 7-4 and the specific protocol(s) assigned for each location are listed in Table 7-5. Operational/Reclamation and Baseline monitoring parameters are listed for surface water on Table 7-6A and Table 7-6B, respectively, and for groundwater on Table 7-7A and 7-7B, respectively. Special Condition No. 4 of the mine Permit requires the Permittee to monitor for selenium where water leaves the mine site, during operational and reclamation phases.

The 85.88 acre Dame Lease IBC has been highwall mined in the near future. The highwall mined boreholes nearly undermined wells, springs, and seeps in the NE ¼ sec. 29, T39S., R5W, mostly east of the sink valley fault. The open pits to the west have started to cause well drawdown in the C3 and C4 series wells. The Division required weekly water monitoring of springs and wells in the Dame's Lease area beginning one month prior, during, and one month after highwall mining has ceased. The Permittee began monitoring the sites weekly in June, 2014 and completed the weekly monitoring in mid-August 2015.

This report was prepared from monitoring data queried from the UDOGM database. The data that support this report were collected and submitted to the database by Alton Coal Development (ACD).

Final approval of Underground mining was granted on June 19, 2015. Monitoring of these points should be included in the 2nd quarter of 2015 water monitoring.

1. Were data submitted for all required sites?

Springs YES NO

Eleven springs are monitored quarterly (Table 7-5). All of the spring locations except one (SP-3) are located in Sink Valley Wash (Drawing 7-10). Five springs are monitored for field parameters only: Sorensen Spring, SP-3, SP-16, SP-22 and SP-23. Six springs are monitored for field parameters and operational analyses: SP-4, SP-6, SP-8, SP-14, SP-20, and SP-33. Sorensen spring, SP-8, SP-14, SP-20,

and SP-22 have weekly measurements beginning one month prior to highwall mining and continuing until one month after highwall mining in the area, followed by monthly measurements for a period of six months. SP-3 is a control spring discharge measurement for the area.

All 11 springs were sampled during Q1 2015 the measured flow at each spring is as follows:

SAMPLE	SITE	Flow (gpm)
SORENSEN SPRING	Alluvial spring Sink Valley	0.24
SP-14	Alluvium - Sink Valley	0.636
SP-16	(Teal Spring) - Alluvium -Sink Valley	0.647
SP-19	(Sorenson Pond)- Alluvium - Sink Valley	0.047
SP-20	Alluvium - Sink Valley	8.11
SP-22	Alluvium - Sink Valley	1.11
SP-23	Alluvium - Sink Valley	0.18
SP-3	Pediment Alluvium - Lower Sink Valley Wash	0.37
SP-33	(Johnson Spring) - Alluvium - Sink Valley	14.96
SP-4	Alluvium/Fault? - Lower Sink Valley Wash	0.728
SP-6	Alluvium - seep in Sink Valley	< 5.
SP-8	Alluvial spring at Dames Ranch	18.6

Notes: Data were collected in mid-December, 2014

Streams YES NO

Ten stream sites are monitored quarterly. Operational analyses are performed for BLM-1, SW-2 (Kanab Creek below Robinson Creek); SW-3 (Kanab Creek above permit area); SW-4 and SW-5 Lower Robinson Creek [LRC] above permit area and above Kanab Creek, respectively); SW-6 (Sink Valley wash at permit boundary); SW-8 (Swapp Hollow Creek above permit area); and SW-9 (Sink Valley Wash below permit area). Field parameters only are measured at RID-1 (irrigation ditch in Robinson Creek) and SW-101 (LRC in permit area). BLM-1, SW-5, SW-6, and SW-9 are monitored quarterly for total and dissolved selenium.

All required stream sites were monitored for this quarter.

Wells YES NO

Table 7-5 identifies 25 wells which will be monitored quarterly when accessible. Wells will be monitored for water elevation only except for six wells, which will be monitored for water elevation and operational parameters: Y-61 (artesian Sink Valley alluvium above mining), LR-45 (LRC alluvium below mining), LS-28, LS-85 (artesian Sink Valley alluvium below mining), SS-30 (Sink Valley alluvium below mining) and UR-70 (LRC alluvium above mining). Several wells are expected to be destroyed or rendered inoperable due to mining activities (MRP page 7-59). These wells are to be

monitored quarterly until they are destroyed or rendered inoperable. Wells C0-18 and C0-54 were destroyed Fourth Quarter of 2011. C9-15, C9-25, C9-40 were destroyed in Q3 of 2013, Y-38 in Q4 2013, and C7-20 in Q3 2014.

All groundwater wells were monitored during this quarter.

UPDES **YES [X] NO []**

Discharges from the Coal Hollow mine are authorized under UPDES General Permit for Coal Mining application number [UT0025992](#). The UPDES permit expires on July 31, 2018 and authorizes discharges from six outfalls: 001, 001B, 002, 003, 004, and 005. These outfalls correspond to sediment ponds 1, 1B, 2, 3 and 4 and discharge location 005. Sediment pond locations are shown on Drawing 5-25. The UPDES permit identifies monitoring frequency and required parameters, effluent limitations, and storm water requirements.

The Operator has submitted data electronically to the Division's water database this quarter. Special Condition No. 1 of the mine Permit requires the Operator to submit water quality data for the Coal Hollow Mine in an electronic format through the Electronic Data Input web site.

2. Were all required parameters reported for each site?

Springs **YES [X] NO []**

Streams **YES [X] NO []**

Stream samples were analyzed for the required operational monitoring parameters specified in the MRP. Special Condition No. 4 of the mine Permit requires the Permittee to monitor for selenium where water leaves the mine site, during operational and reclamation phases. All operational samples from stream sites are being analyzed for dissolved selenium, while only BLM-1, SW-5, SW-6, and SW-9 are required.

Wells **YES [X] NO []**

UPDES **YES [X] NO []**

The Operator has submitted data electronically to the Division's water database. In addition to the monitoring requirements established by the UPDES permit, Special Condition No. 4 of the mine Permit requires the Permittee to monitor for selenium where water leaves the mine site, during operational and reclamation phases.

3. Were irregularities found in the data?

Listed parameters are more than two standard deviations above the mean.

Springs **YES [] NO [X]**

Streams **YES [X] NO []**

See Total Selenium levels in Streams (Figure 2). There was a significant spike in levels early in 2014 that have since gone down. Chemtech-Ford had a difficult time processing Selenium Q4 2014.

Up to date graphs will be done for Q2 2015.

Wells **YES [X] NO []**

See Total Selenium levels in Wells (Figure 2). There was a significant spike in levels early in 2014 that have since gone down. Chemtech-Ford had a difficult time processing Selenium Q4 2014. Up to date graphs will be given Q2 2015.

Well 102 is rebounding, the lower values seen may be a seasonal/climatic pattern (Figure 1).

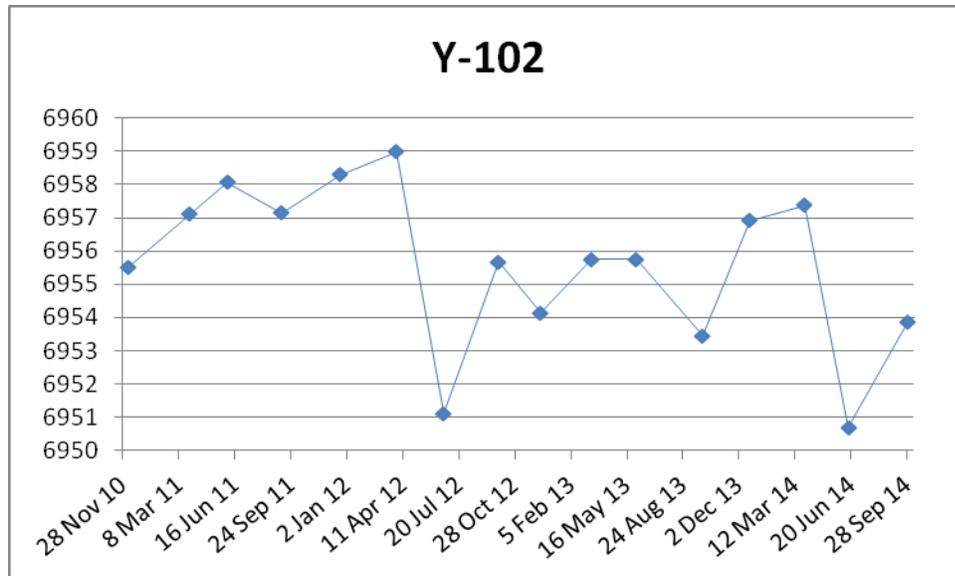
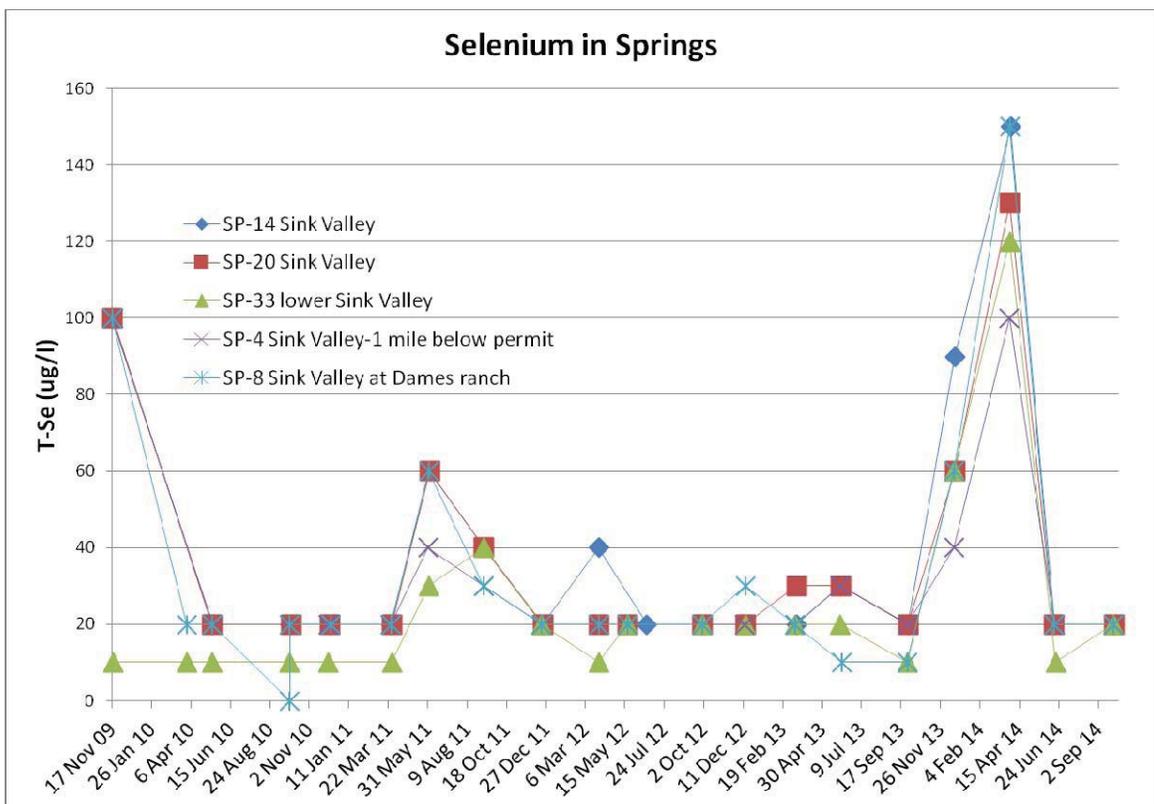


Figure 1. Well Y-102: Alluvial well in upper Sink Valley to the east of pit 9 in permit area.



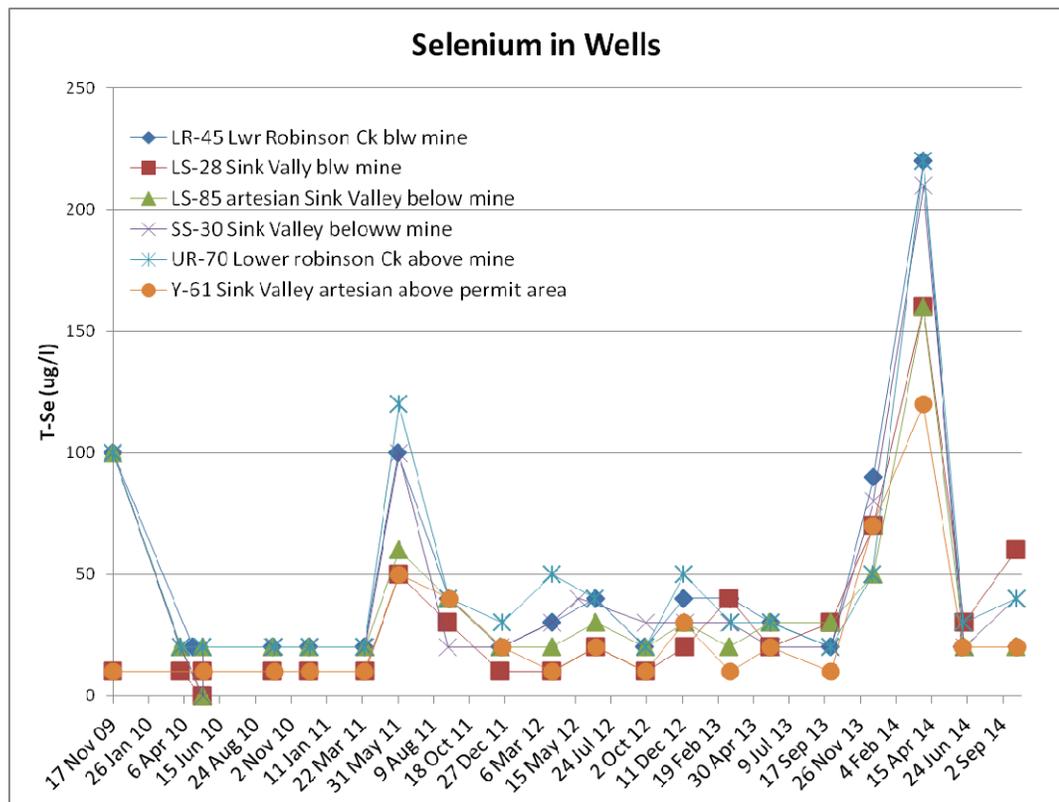
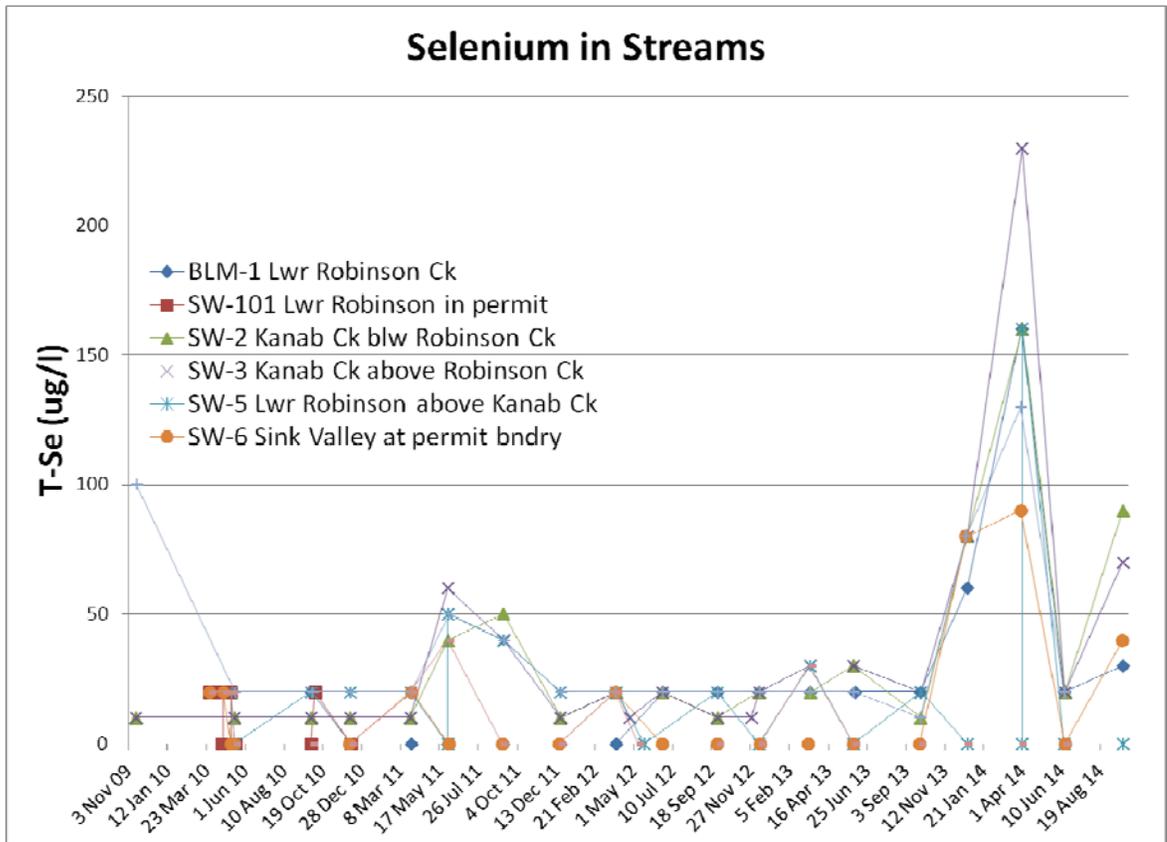


Figure 2. Elevated Selenium levels at Spring, Stream, and Well sampling locations in Q2 2014.

UPDES **YES [] NO [X]**

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

Re-sampling for baseline parameters is due every five years during the third or first quarter. Baseline parameters for surface water and groundwater monitoring are listed in Table 7-6B and Table 7-7B, respectively. Assuming that the five-year baseline resampling will coincide with permit renewal, the next baseline resampling is due during third or fourth quarter 2015.

5. Based on your review, what further actions, if any, do you recommend? YES [] NO [X]

None, however tracking the water elevation in well Y-102 would be worth continued examination. Continue to monitor elevated selenium in springs, streams, and wells. Graph the water levels of wells down gradient of the mine including: SS wells, LS wells, Y-63, C2, C3, C4 wells and LR-45. Also graph the discharge of any springs that may be down gradient.

Write a code in R to quickly graph this data.

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

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

None