FINAL
ADIT DISCHARGE MONITORING
TECHNICAL MEMORANDUM

CARPENTER-SNOW CREEK MINING DISTRICT NPL SITE
SUPPLEMENTAL STUDIES FOR THE REMEDIAL INVESTIGATION
CASCADE COUNTY, MONTANA

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Prepared for:

Montana Department of Environmental Quality
Remediation Division
P.O. Box 200901
Helena, Montana 59620

and

U.S. Environmental Protection Agency – Region 8
10 West 15th Street
Helena, Montana 59626

Prepared By:

Tetra Tech, Inc. (EMI Unit)
7 West 6th Avenue, Suite 612
Helena, Montana 59601
(406) 442-5588

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ACRONYMS AND ABBREVIATIONS

amsl	above mean sea level
CSCMD	Carpenter-Snow Creek Mining District
DEQ	Montana Department of Environmental Quality
EPA	U.S. Environmental Protection Agency
ESAT	Environmental Services Assistance Team
FS	Feasibility Study
gpm	Gallons per minute
GCM	GCM Services, Inc.
NPL	National Priorities List
PVC	Polyvinyl chloride
RI	Remedial Investigation
SAP	Sampling and Analysis Plan
Tetra Tech	Tetra Tech, Inc. (EMI Unit)
TechLaw	Tech Law, Inc.
USFS	U.S. Forest Service

1.0 INTRODUCTION

The Montana Department of Environmental Quality (DEQ), in cooperation with the U.S. Environmental Protection Agency (EPA) and the U.S. Forest Service (USFS), tasked Tetra Tech, Inc. (EMI Unit) (Tetra Tech) to continue monitoring started in 2012 and 2013 and perform additional field work supporting the Feasibility Study (FS) at the Carpenter-Snow Creek Mining District (CSCMD) National Priorities List (NPL) Site. Tetra Tech completed a draft Remedial Investigation (RI) in 2015. The CSCMD Site is in Cascade County in an area starting from approximately four miles northeast of Neihart, Montana, trending southwest through town and ending just southwest of Neihart.

Mine tailings, waste rock, and mine influenced water are present in tailings, soil, surface water, sediment, and groundwater throughout the CSCMD Site. Previous investigations show that the waste rock and tailings contain elevated concentrations of heavy metals and arsenic that may pose a risk to ecological receptors and to human recreational and residential users. Remediation of the CSCMD Site will be necessary if concentrations of contaminants in tailings, soil, surface water, sediment, and groundwater pose unacceptable risks to human health or ecological receptors.

Tetra Tech prepared this technical memorandum for the DEQ under Contract Number 414038, Task Order 9, to present the flow monitoring and water quality data from nine mines at the CSCMD Site. In 2014, water quality samples were collected year round from the Silver Dyke, Compromise (shaft), Dacotah, Lower Rebellion, Yellow Jacket, Big Seven, Broadwater, Evening Star, and Lexington mine adits. Mine influenced water flows were continuously monitored at the Silver Dyke adit, the vertical shaft at the Compromise mine, the Dacotah adit, and the Lower Rebellion adit. Flow monitoring at the Yellow Jacket adit began at the end of November 2014. The sampling and flow monitoring locations are shown on Figure 1-1.

The remainder of this technical memorandum contains:

- The Site history for the areas inspected,
- The methods used for flow monitoring and water sampling,
- The flows and parameters measured during the monitoring,

- The analytical results of the sampled adit water, and
- The deviations made from the 2014 Sampling and Analysis Plan (SAP).

2.0 SITE HISTORY

All of the surface water, sampling and monitoring locations are within the CSCMD Site boundary. The CSCMD Site was a major silver producer in Montana and the primary producer in Cascade County, producing about $16 million in silver between 1882 and 1929 (Sahinen 1935; GCM Services, Inc. [GCM] 1991). The first claim in the Neihart mining district was made in July 1881. Development slowed during the mid- to late-1880s, then began to increase after construction of the Great Falls smelter and the Belt Mountain branch of the Great Northern Railroad, in 1891, that connected Neihart with Great Falls.

In 2014, Tetra Tech was tasked with monitoring the flow at the Silver Dyke adit, Compromise shaft, Dacotah adit, Lower Rebellion adit, and Yellow Jacket adit. Flow was monitored continually throughout the year at the Silver Dyke adit, Compromise shaft, and Lower Rebellion adit. Flow at the Dacotah adit was monitored continually until monitoring and sampling were discontinued in November. The flow meter from the Dacotah adit was reinstalled at the Yellow Jacket adit in November. Water samples and field parameters were collected from the Silver Dyke, Compromise (shaft), Dacotah, Lower Rebellion, Yellow Jacket, Big Seven, Broadwater, Evening Star, and Lexington mine adits. Water samples were collected biweekly during the field season (May 2014 through October 2014) and monthly during the rest of the year. During peak runoff at the end of May 2014 and beginning of June 2014, water samples were collected once a week.

In 2013, Tetra Tech continuously monitored adit flow and collected water samples and field parameters from the Silver Dyke, Lower Rebellion, Dacotah, and Compromise adits. Water samples and field parameters were also collected from the Broadwater, Evening Star, and Big Seven mine adits in 2013. The results are in a technical memorandum titled “Adit Discharge Monitoring” (Tetra Tech, 2014a). In addition to Tetra Tech’s monitoring and sampling, EPA Environmental Services Assistances Team (ESAT) collected water samples from multiple adits

throughout the Site since 2011. The results are in the annual Sampling Activities Reports (Tech Law Inc. [TechLaw] 2012, 2013, 2014, 2015).

Silver Dyke Mine

During its operation, the Silver Dyke was the largest producer of ore in the Neihart mining district, with silver production second only to Silver Bow County (Schafer 1935). The ore body consisted of an altered quartz porphyry and gneiss breccia surrounded by a granite gneiss on one side and an unchanged porphyry on the other. The ore body was configured in an elliptical shape with a maximum length of 600 feet and width of 400 feet and was mined to a depth of approximately 150 feet (Schafer 1935).

Beginning in 1921, 1 million tons of ore were blocked out and a 500-ton flotation mill was constructed. In 1926, the capacity of the mill was increased to 950 tons. Because of clayey nature of the ore and its sticky properties, the open pit mining departed from the usual glory hole practice. Two pairs of vertical raises were extended upward from adits below the current glory hole and ore was loaded out from below. After the initial raises were completed, the pit was extended by blasting drill holes from above the mine. The Silver Dyke operated until 1929, when the blocked-out ore was depleted and no new deposits could be found. Water is flowing continually from an adit at an elevation of 6,830 feet above mean sea level (amsl) on the southwest side of the Silver Dyke Complex. The adit drainage is the primary source of water in Sih'mem Creek, a tributary to Carpenter Creek.

The Silver Dyke adit flow was measured from a 6-inch polyvinyl chloride (PVC) pipe that drains from the collapsed adit. Water quality parameters at the Silver Dyke were constantly monitored using a multi-parameter sonde beginning in May and lasting throughout the 2014 field season.

Compromise Mine

The Compromise claim is in the town of Neihart and extends across Main Street near its northern end. The claim is part of the Moulton group. The claim was located on March 15, 1884 by John Wilson. The first development was a 400-foot long adit driven northward toward

the main Moulton claim. Sometime before 1930, an additional adit on the Compromise claim was driven on the Moulton vein and extended into the Moulton claim.

Around 1945, a 150-foot shaft was sunk at a point southeast from the portal of the main adit. A drift was driven northward for several hundred feet on the 120-foot level of this shaft. No known additional work was completed on the mine.

Water flows continually from a vertical shaft. The elevation of the shaft is 5,750 feet amsl. The water from the shaft flows down Compromise Gulch into Neihart and continues under Highway 89 to intersect with Belt Creek. In 2012, a small dam was constructed and PVC pipe installed to consolidate and monitor the flow from the shaft.

Dacotah Mine

The Dacotah mine is approximately 1 mile northeast of Neihart at the head of Rock Creek. The mine was located in 1883 and consists of three patented claims and one unpatented claim. It was leased by the Neihart Mining Co. in 1891 and operated intermittently until 1897, when the main adit caved in about 300 feet from the portal opening. The mine was reopened and operated in 1911 and 1912 by Charles Whitcomb & Co. The mine was reopened again in 1924 and operated until 1926.

The mine remained closed until 1942 when Carrol Bennett organized the Bennett Mining Co. and reopened the Florence mill to process about 60 tons of ore a day from the Dacotah. The mine and mill were operated continuously until the latter part of 1945. The mine was reopened again in 1946 and operated until May 1949. No records of further operation have been found.

Water flows continually from a collapsed adit on the west side of the mine. The elevation of the adit is 6,570 feet amsl. The adit discharge is a contributing source of Rock Creek and eventually comes in contact with the Moulton mine farther down the drainage. A small dam was constructed with a PVC pipe to consolidate and monitor flow from the adit. Water quality parameters at the Dacotah were constantly monitored from May 2014 through the end of the field season using a multi-parameter sonde.

Lower Rebellion Mine

The Rebellion claim is part of the Benton group of 15 patented claims. The Lower Rebellion mine refers to the lower of two adits on the claim. The mine is in the upper Snow Creek Valley, approximately 2 miles northeast of Neihart. The Benton group is made up of claims that were located from 1886 to 1890. The claims were later acquired by the Benton Group Mining Co.

There was considerable development on the mine in 1891 and 1892. Records indicate the mine's ore value was largely in silver with some gold. Lead ore was found in multiple areas in the ore body but was generally low value.

Water flows continually from the adit. The elevation of the adit is 7,010 feet amsl. The adit discharge is a contributing source of Snow Creek that eventually joins Carpenter Creek. In 2012, a small dam was constructed to consolidate the flow to a PVC pipe to monitor flow from the adit.

The Yellow Jacket Adit

The Yellow Jacket mine is in the Rock Creek drainage just north of the town of Neihart, 1 mile east of Belt Creek.

Water flows continuously from the Yellow Jacket adit. The water from the adit flows west into Rock Creek and continues under Highway 89 to intersect Belt Creek. In the fall of 2014, a small dam was constructed with a 6-inch PVC pipe to consolidate and monitor the flow from the Yellow Jacket adit.

Big Seven Mine

The Big Seven mine is in the upper Snow Creek Valley, approximately 2 miles northeast of Neihart. The mine consists of a group of 11 patented and 2 unpatented claims. Most of the claims at the mine were located in the early 1890s. The mine was initially operated by Big Seven Mining Company and later by D.L.S. Barker and the Montana Silver Queen Mining Company. The company was incorporated in 1935 and combined with the Lexington Mining Company in 1940. The Lexington Mining Company operated the mine until 1943, when it

received a substantial remodel and was leased to the Montana Leasing Company. The Montana Leasing Company operated the mine until 1946.

The last records for the mine date to 1977, when the status of the mine was listed as inactive. The last owner/operator is listed as the Montana Silver Queen Mining Co.

Water flows continually from the adit. The elevation of the adit is 7,085 amsl. The water from the adit flows into Snow Creek that eventually joins Carpenter Creek. No devices were constructed to monitor flow at the Big Seven, but water samples were collected.

Broadwater Mine

The Broadwater mine is located in a drainage toward the south end of the Neihart Slope. The mine initially consisted of five mining claims: the St. Julien, Minnehaha, Maud S, Montana Belle, and Dickens. Some of the claims were initially located in 1881. The Broadwater was mined for silver, lead, and zinc, and was a major producer of silver in the Neihart mining district. Its ownership changed many times over its 98-year operation.

Ore from the Broadwater mine was sent to several different facilities in the area for processing. In 1906, a tramway was constructed to convey ore to a 250-ton mill in Neihart. In 1940, the owners of the Broadwater mine constructed a 70-ton flotation mill on the New Idea mining claim in Neihart to process ore from the Broadwater and other mines in the area. The mill capacity was upgraded in 1941 to 80 tons. Ore production was reported at the mine until 1979, and the latest development at the mine was reported in 1981.

Water flows continually from an adit on the south end of the mine. The elevation of the adit is 6,038 feet amsl. This water is a contributing source of an unnamed creek that enters wetlands of Belt Creek near the Neihart Community Center. Flow at the Broadwater was monitored using a weir in 2012 but was discontinued because the water is fairly clean in comparison to the other adits within the CSCMD Site. In 2014, water samples were collected.

Evening Star Mine and Mill

The Evening Star mine and mill is north of Neihart on the east site of Belt Creek directly below the Florence mine. The Evening Star was located in 1884 and records indicate it was mined in conjunction with the London mine. The claim was patented in 1920 and worked intermittently until 1939. The mill was remodeled in 1944, and again in 1969. The last work at the mine was the construction of office and shop buildings in 1969.

Water flows continually from the Evening Star adit. The elevation of the adit is 5,620 amsl. The water from the adit flows west into a culvert and continues under Highway 89 to intersect with Belt Creek. No devices to monitor flow were constructed at the Evening Star, but water samples were collected.

Lexington Mine

The Lexington mine is in the upper Snow Creek Valley, approximately 2 miles northeast of Neihart, on the north side of Neihart Baldy. The mine was operated beginning in 1891 by the Lexington Consolidated Mining Co. and mined for silver and lead (Robertson, 1951). The five patented claims in the Lexington group changed hands several times eventually leading to ownership by the Lexington Silver Lead Mines, Inc. No records mention when the mine ceased operation, but the workings were noted as being inaccessible as early as 1949.

Water flows continually from the adit. The water from the adit is a contributing source of Snow Creek that eventually joins Carpenter Creek. No devices were constructed to monitor flow at this site, but water samples were collected.

3.0 METHODS

The flow and water quality of adit discharges was monitored by building dams, installing continuous flow and parameter monitoring equipment, and collecting adit water samples. The field procedures were completed as specified in the SAP (Tetra Tech 2014b).

3.1 FLOW AND WATER QUALITY MONITORING

Mine influenced water flows were continuously measured at the Lower Rebellion, Compromise, and Dacotah mines using small concrete dams to confine the flows into 6-inch PVC pipes. The mine water discharge at the Silver Dyke already drained from a 6-inch PVC pipe. In November of 2014, a 6-inch pipe was installed at the Yellow Jacket adit. A small concrete dam was constructed like the dams at the Lower Rebellion, Compromise, and Dacotah mine adit discharges. Teledyne ISCO 2150 Area Velocity Modules are mounted into the PVC pipes at each mine to measure and record the flow at 15-minute intervals. The flows at the Silver Dyke, Lower Rebellion, Compromise (shaft), and Dacotah adits have been measured since April 2013. The units recorded velocity and depth of water in the pipe. A minimum accurate flow was determined based on the inaccuracy of recorded velocity and flow readings less than 1 inch, as indicated by the manufacturer. The minimum accurate flow was calculated by finding the average velocity at a water level of 1 inch from the recorded Silver Dyke data; the reading was found to be 7.3 gallons per minute (gpm). Any average weekly average flow value under this minimum calculated flow is noted as being less than 7.3 gpm.

Additionally, multi-parameter sondes were used to collect water quality parameters at 15-minute intervals from May 8 to September 15, 2014 at the Silver Dyke adit and from May 8 to November 4, 2014 at the Dacotah adit. YSI multi-parameter sondes were used at the Silver Dyke and Dacotah adits from May 8, 2014 to July 16, 2014 when the YSI sondes were replaced with Hanna sondes. Measured water quality data and flow data are in Appendices A and B respectively.

Precipitation data at the Silver Dyke, Lower Rebellion, and Broadwater adits were collected and logged, using a Davis Instruments Rain Collector II, since May 2013. Data for these devices were logged only during measureable precipitation events. The precipitation data logs are in Appendix C.

3.2 FLOW CALCULATIONS

Flow rates at the Compromise shaft, Dacotah adit, Lower Rebellion adit, Silver Dyke adit, and the Yellow Jacket adit were calculated with data collected from the ISCO 2150 Area Velocity Modules. The Flowlink 5.1 software was used in conjunction with the area velocity method to calculate flow in a partially filled pipe. Weekly and total averages were calculated for each mine.

3.3 WATER SAMPLING

Surface water at the Lexington adit was collected once in February of 2014 and monthly from mid-June through October 2014. At each of the other eight mines, samples were collected monthly from January through March 2014, then sampled bi-weekly in April and May 2014. From mid-May to mid-June 2014, samples were taken once a week to capture effects from higher adit flows from the spring runoff. After the runoff, bi-weekly sampling resumed at the end of June and continued until the end of October 2014. Final samples were collected in November 2014 and December 2014 at the Silver Dyke, Big Seven, Lower Rebellion, Broadwater, Compromise, Yellow Jacket, and Evening Star adits. Samples at the Dacotah adit were collected until the end of November 2014. Additional opportunistic samples were collected from a new seep at the road above the Big Seven adit flow twice in June of 2014.

At locations where flow was being recorded, samples were collected from the PVC pipes where the consolidated flow left the mines. At other locations, samples were collected as close to the original mine opening as access allowed. Adit and shaft water sample collection began on January 29, 2014. The last samples that will be discussed in this memorandum were collected on December 23, 2014.

The samples were collected in accordance with the 2014 SAP by submerging the sample bottles in the flow. Samples to be analyzed for total and dissolved metals were preserved with Nitric Acid. Samples were transported on ice in a cooler and shipped with a chain of custody to the EPA Contract Laboratory Program (CLP) Regional Laboratory in Golden, Colorado for analysis. All samples were analyzed for CLP Total Metals (EPA Method SOW ISM01.3) and selected

anions (EPA Method 300.0); every other sample set included a sample for dissolved metals (EPA Method SOW ISM01.3) in accordance with the 2014 SAP. The complete ESAT analytical results are in Appendix D.

3.4 DEVIATIONS FROM THE 2014 SAP

The SAP noted that the Dacotah adit flow would be monitored until December 2014 (Tetra Tech, 2014b). However, sampling was discontinued in November of 2014. The ISCO 2150 Area Velocity Module was removed from the Dacotah adit on November 21, 2014 and reinstalled at the Moulton/Yellow Jacket adit on November 25, 2014. In the 2014 SAP, it was noted that a 6-inch PVC pipe would be installed at the Evening Star mine for the installation of the ISCO 2150 Area Velocity Module. However, the Yellow Jacket mine was selected to install the ISCO 2150 Module because of an identified data gap. A dam was constructed at the Yellow Jacket adit using concrete to channel the flow into an installed 6-inch PVC pipe.

In the 2014 SAP, flow was to be continuously monitored at the Silver Dyke adit; however, during the period when the Aquafix unit was installed at the adit (September 15 through October 29, 2014), adit flow was not recorded with the ISCO 2150 Area Velocity Module.

4.0 SILVER DYKE ADIT RESULTS

4.1 ADIT FLOW

The 2014 calculated average flow rate at the Silver Dyke adit was 25 gpm. The weekly and total average flows are in Table 4-1 and on Figure 4-1.

The adit flow peaked in late May at 154 gpm. The flow steadily decreased until mid-August when the flow increased through September which corresponds with heavy rainfall that fell in the area in late August. The flow was not monitored from September 15 through late October because the Aquafix system was operating at the Silver Dyke adit during that time. The high flows measured from the end of May into June correspond with widespread runoff from snow melt observed throughout the drainage.

Precipitation data was collected throughout the majority of the flow monitoring period. The precipitation data logs are in Appendix C.

4.2 ADIT WATER MONITORING AND SAMPLING RESULTS

Water samples were collected and sent to the ESAT laboratory to be analyzed for Total Recoverable Metals (EPA Method 200.1) and anions (EPA Method 300.0). Twenty-three samples were analyzed for total metals and select anions, of which 11 were also analyzed for dissolved metals (EPA Method SOW ISM01.3). The first sample was collected on January 29, 2014 and the last on December 22, 2014. The analytical results are in Table 4-2. The complete ESAT analytical results are in Appendix D.

Adit water quality parameters were continuously monitored at the Silver Dyke at 15-minute intervals using an YSI multi-parameter sonde from May 8 until July 16 when the YSI sonde was replaced with a Hanna sonde that was used to monitor the adit water through September 15. There were small data gaps (no more than a few hours) when equipment was being cleaned and batteries were being replaced. The complete water quality parameter data are in Appendix A. The weekly average water quality parameters along with weekly average flow are in Table 4-3. Additional water quality field parameters were taken when the Hanna Sonde was not installed at the Silver Dyke when a sample was collected. These additional parameters are in Table 4-3.

5.0 COMPROMISE SHAFT RESULTS

5.1 SHAFT FLOW

The calculated total average flow rate at the Compromise shaft for 2014 was 11 gpm. The weekly and total average flows are in Table 4-1 and on Figure 5-1.

The shaft flow was relatively low in late April, peaked in early May at 29 gpm, and steadily decreased through late October. The flow rates in late April and late October are similar and represent low flow periods. The high flows throughout the month of May correspond with widespread runoff from snow melt observed throughout the drainage.

5.2 SAMPLING RESULTS

Water samples were collected and sent to the ESAT laboratory to be analyzed for Total Recoverable Metals (EPA Method 200.1) and anions (EPA Method 300.0). Twenty-three samples were collected from the adit and analyzed for metals and select anions, 12 of which were also analyzed for dissolved metals (EPA Method SOW ISM01.3). The first sample was collected on January 30, 2014 and the last on December 22, 2014. The analytical results for the Compromise shaft are in Table 5-1. The complete ESAT analytical results are in Appendix D. Field water quality parameters were taken when a sample was collected and are compiled in Table 5-2. Dissolved oxygen readings on June 5 and June 12, 2014 may not be accurate; they do not follow the same general trend as the rest of the dissolved oxygen parameters collected at the other sampling dates. There are several potential reasons why the readings may not be accurate: the probe may have been faulty, not calibrated correctly, or not submerged completely. After June 12, 2014, readings resumed consistency in the expected range.

6.0 DACOTAH ADIT RESULTS

6.1 ADIT FLOW

The 2014 calculated average flow rate at the Dacotah adit was 16 gpm. The weekly and total average flows are in Table 4-1 and on Figure 6-1.

The adit flow was relatively low in late April, peaked in early May, decreased quickly through the month of May. The flow increased again throughout September, October, and November. The high flows at the beginning of May correspond with widespread runoff from snow melt observed throughout the drainage. The high flows at the end of 2014 were felt to be irregular. There could be several factors that would have affected this increase in the measured flow, but field personnel did not observe any problems. The data may not be an accurate portrayal of the flow.

6.2 ADIT WATER MONITORING AND SAMPLING RESULTS

Water samples were collected and sent to the ESAT laboratory to be analyzed for Total Recoverable Metals (EPA Method 200.1) and anions (EPA Method 300.0). Twenty-two samples were collected from the adit throughout the year, until sampling was discontinued after the November sampling. Samples were analyzed for metals and select anions, of which 10 were also analyzed for dissolved metals (EPA Method SOW ISM01.3). The first sample was collected on January 29, 2014 and the last on November 21, 2014. The analytical results are in Table 6-1. The complete ESAT analytical results are in Appendix D.

Adit water quality parameters were continuously monitored at the Dacotah at 15-minute intervals for the duration of the adit monitoring. There is a data gap starting October 1, 2014 through the removal of the sonde on November 4, 2014 when the pH probe malfunctioned. The complete parameter data are in Appendix A. The weekly average water quality parameters and weekly average flow are in Table 6-2.

7.0 LOWER REBELLION ADIT RESULTS

7.1 ADIT FLOW

The 2014 calculated average flow rate at the Lower Rebellion adit was 71 gpm. The weekly and total average flows are in Table 4-1 and on Figure 7-1.

The adit flow peaked at the end of May at 205 gpm, and steadily decreased before a smaller peak flow at the beginning of September which corresponds with heavy rainfall that fell in the area in late August. The high flows that were measured throughout May and into June correspond with widespread runoff from snow melt observed throughout the drainage.

Precipitation data was collected throughout the majority of the flow monitoring period. The precipitation data logs are in Appendix C.

7.2 ADIT WATER MONITORING AND SAMPLING RESULTS

Water samples were collected and sent to the ESAT laboratory to be analyzed for Total Recoverable Metals (EPA Method 200.1) and anions (EPA Method 300.0). Twenty-three samples were collected from the adit in 2014. Samples were analyzed for metals and select anions, of which 11 were also analyzed for dissolved metals (EPA Method SOW ISM01.3). The first sample was collected on January 30, 2014 and the last on December 22, 2014. The analytical results are in Table 7-1. The complete ESAT analytical results are in Appendix D. Field water quality parameters were taken when a sample was collected and are compiled in Table 7-2. Field water quality parameters were taken where the adit drainage crosses the Lower Rebellion road. These parameters are in Table 7-2. Dissolved oxygen readings on June 5, 2014 may not be accurate; they do not follow the same general trend as the rest of the dissolved oxygen parameters from the other sampling dates. There are several potential reasons why the readings may not be accurate: the probe may have been faulty, not calibrated correctly, or not submerged completely. After June 5, 2014, readings resumed consistency in the expected range.

8.0 YELLOW JACKET ADIT RESULTS

8.1 ADIT FLOW

The 2150 ISCO flow meter was installed in November after the removal of the meter at the Dacotah Adit. Flow monitoring at the Yellow Jacket adit will continue in 2015. The calculated average flow rate for November 25, 2014 through December 31, 2014 was less than the calculated accurate minimum flow rate of 7.3 gpm described in Section 3.1. The weekly and total average flows are in Table 4-1.

8.2 ADIT WATER MONITORING AND SAMPLING RESULTS

Water samples were collected and sent to the ESAT laboratory to be analyzed for Total Recoverable Metals (EPA Method 200.1) and anions (EPA Method 300.0). Twenty-three samples were collected from the adit in 2014. Samples were analyzed for metals and select

anions, of which 11 were also analyzed for dissolved metals (EPA Method SOW ISM01.3). The first sample was collected on January 30, 2014 and the last on December 22, 2014. The analytical results are in Table 8-1. The complete ESAT analytical results are in Appendix D. Field water quality parameters were taken when a sample was collected and are compiled in Table 8-2. Dissolved oxygen readings on June 5 and June 12, 2014 may not be accurate; they do not follow the same general trend as the rest of the dissolved oxygen parameters collected at the other sampling dates. There are several potential reasons why the readings may not be accurate: the probe may have been faulty, not calibrated correctly, or not submerged completely. After June 12, 2014, readings resumed consistency in the expected range.

9.0 BIG SEVEN ADIT RESULTS

Water samples were collected and sent to the ESAT laboratory to be analyzed for Total Recoverable Metals (EPA Method 200.1) and anions (EPA Method 300.0). Twenty-two samples were collected from the adit in 2014 and were analyzed for metals and select anions. Eleven of the samples were also analyzed for dissolved metals (EPA Method SOW ISM01.3). The first sample was collected on February 20, 2014 and the last on December 23, 2014. The analytical results are in Table 9-1. Two opportunistic samples were collected from the seep along the road above the Big Seven adit discharge in June 2014 as shown in Figure 1-1. The analytical results for these samples are in Table 9-1. The complete ESAT analytical results are in Appendix D. Field water quality parameters were taken when each grab sample was collected. These parameters are provided in Table 9-2. Dissolved oxygen readings on June 5 and June 12, 2014 may not be accurate; they do not follow the same general trend as the rest of the dissolved oxygen parameters collected at the other sampling dates. There are several potential reasons why the readings may not be accurate: the probe may have been faulty, not calibrated correctly, or not submerged completely. After June 12, 2014, readings resumed consistency in the expected range in the expected range.

10.0 BROADWATER ADIT RESULTS

Water samples were collected and sent to the ESAT laboratory to be analyzed for Total Recoverable Metals (EPA Method 200.1) and anions (EPA Method 300.0). Twenty-three samples were analyzed for metals and select anions, of which 11 were also analyzed for dissolved metals (EPA Method SOW ISM01.3). The first sample was collected on January 29, 2014 and the last on December 22, 2014. The analytical results are in Table 10-1. The complete ESAT analytical results are in Appendix D. Field water quality parameters were taken when each grab sample was collected. These parameters are provided in Table 10-2. Dissolved oxygen readings on June 12, 2014 may not be accurate; they do not follow the same general trend as the rest of the dissolved oxygen parameters from the other sampling dates. There are several potential reasons why the readings may not be accurate: the probe may have been faulty, not calibrated correctly, or not submerged completely. After June 12, 2014, readings resumed consistency in the expected range. Precipitation data was collected throughout the majority of the flow monitoring period. The precipitation data logs are in Appendix C.

11.0 EVENING STAR ADIT RESULTS

Water samples were collected and sent to the ESAT laboratory to be analyzed for Total Recoverable Metals (EPA Method 200.1) and anions (EPA Method 300.0). Twenty-three samples were analyzed for metals and select anions, of which 11 were also analyzed for dissolved metals (EPA Method SOW ISM01.3). The first sample was collected on January 30, 2014 and the last on December 22, 2014. The analytical results are in Table 11-1. The complete ESAT analytical results are in Appendix D. Field water quality parameters were taken when each grab sample was collected and are provided in Table 11-2. Dissolved oxygen readings on June 5 and June 12, 2014 may not be accurate; they do not follow the same general trend as the rest of the dissolved oxygen parameters from the other sampling dates. There are several potential reasons why the readings may not be accurate: the probe may have been faulty, not calibrated correctly, or not submerged completely. After June 12, 2014, readings resumed consistency in the expected range.

12.0 LEXINGTON ADIT RESULTS

Water samples were collected and sent to the ESAT laboratory to be analyzed for Total Recoverable Metals (EPA Method 200.1) and anions (EPA Method 300.0). Thirteen samples were collected from the Lexington adit in 2014. Samples were collected in February and from mid-June and through October. All 13 samples were analyzed for metals and select anions, of which 6 were also analyzed for dissolved metals (EPA Method SOW ISM01.3). The first sample was collected on February 20, 2014 and the last on October 30, 2014. The analytical results are in Table 12-1. The complete ESAT analytical results are in Appendix D. Field water quality parameters were taken when each grab sample was collected and are provided in Table 12-2. Dissolved oxygen readings on June 12, 2014 may not be accurate; they do not follow the same general trend as the rest of the dissolved oxygen parameters from the other sampling dates. There are several potential reasons why the readings may not be accurate: the probe may have been faulty, not calibrated correctly, or not submerged completely. After June 12, 2014, readings resumed consistency in the expected range.

13.0 CONCLUSIONS

Flow, water quality parameters, and metals concentrations were measured at the Silver Dyke, Compromise, Dacotah, Moulton/Yellow Jacket, and Lower Rebellion mines during 2014. The average flows and pHs for the monitoring period were:

- An average flow of 25 gpm and an average pH of 4.51 for the Silver Dyke adit;
- An average flow of 11 gpm and an average pH of 7.04 for the Compromise shaft;
- An average flow of 16 gpm and an average pH of 3.07 for the Dacotah adit;
- An average flow of 71 gpm and an average pH of 5.08 for the Lower Rebellion adit;
- Less than the minimum calculated accurate flow rate of less than 7.3 gpm and an average pH of 7.49 at the Yellow Jacket adit;
- An average pH of 5.82 at the Big Seven adit;
- An average pH of 7.08 at the Broadwater adit;
- An average pH of 7.00 at the Evening Star adit; and
- An average pH of 7.06 at the Lexington adit.

Water samples and field parameters were collected from mine influenced water discharge from the Big Seven, Lexington, Evening Star, and Broadwater mines during the 2014 field season. Additional monitoring at seven of the nine sites will continue through 2015 not including the Lexington and Dacotah mines.

14.0 REFERENCES

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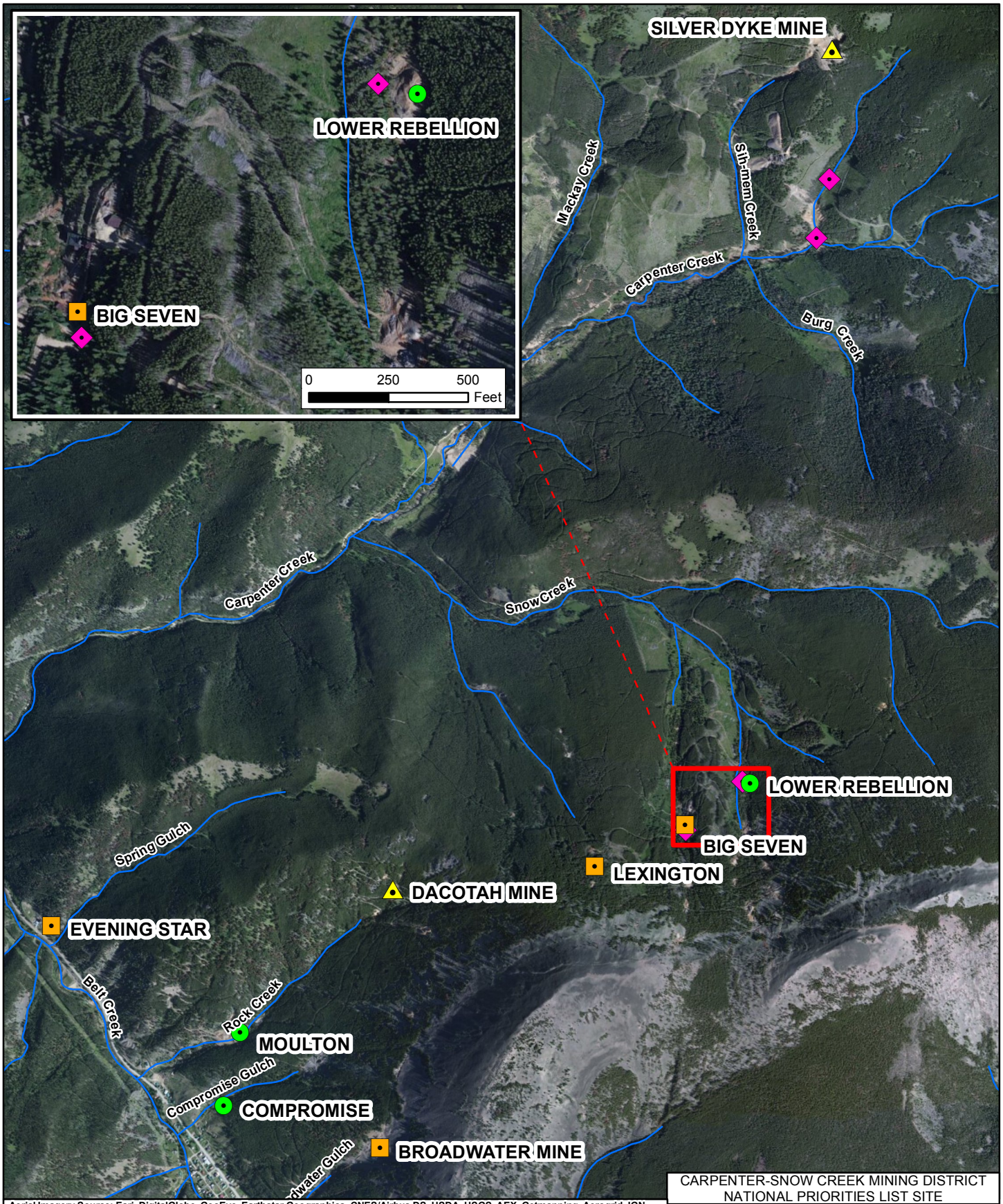
FIGURES



Aerial Imagery Source: Esri, DigitalGlobe, GeoEye, Earthstar Geographics, CNES/Airbus DS, USDA, USGS, AEX, Getmapping, Aerogrid, IGN,

LEGEND

- STREAM
- CONTINUOUS FLOW MONITORING, SPOT WATER QUALITY PARAMETERS, GRAB SAMPLES
- CONTINUOUS FLOW MONITORING, GRAB SAMPLES
- GRAB SAMPLES
- OPPORTUNISTIC SAMPLES

N

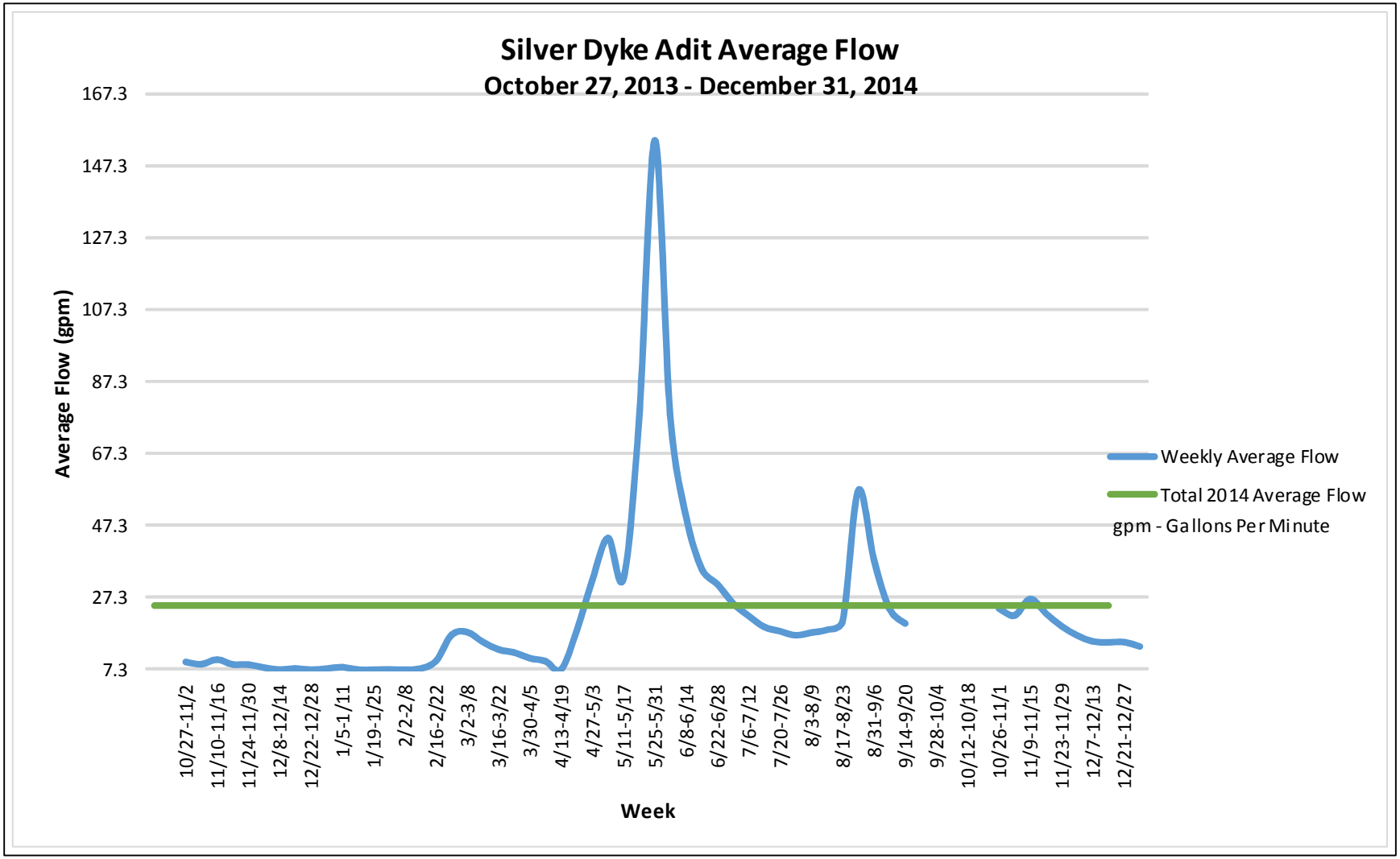
0 1,000 2,000 3,000 Feet

CARPENTER-SNOW CREEK MINING DISTRICT
NATIONAL PRIORITIES LIST SITE

FIGURE 1-1
SURFACE WATER SAMPLING AND MONITORING LOCATIONS

TETRA TECH

GIS MAP BY DOUG HEROLD TTEMI-HELENA - Figure_1-1_Surface_Water_Sampling_Monitoring_040815.mxd

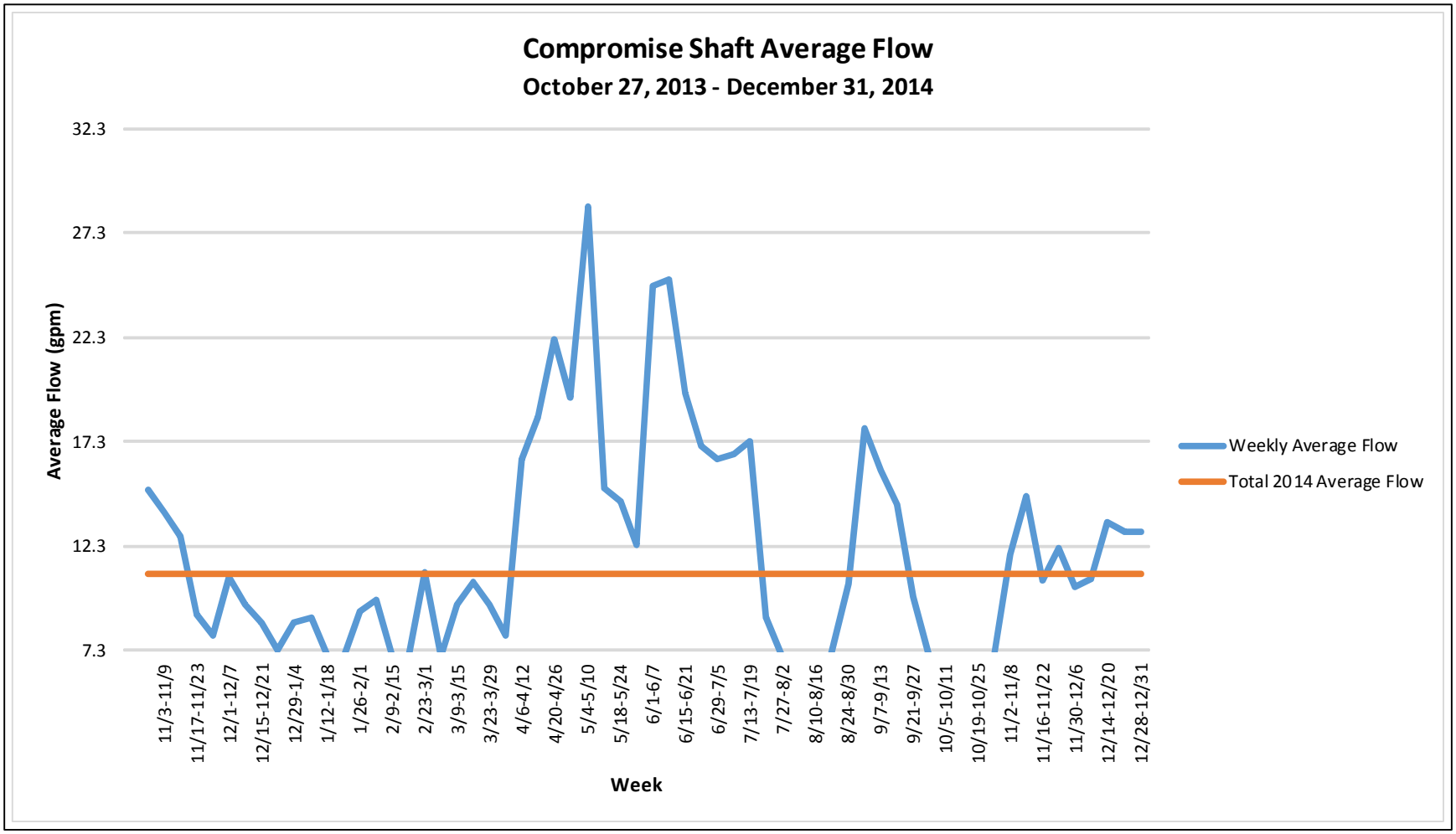


CARPENTER-SNOW CREEK MINING DISTRICT
NATIONAL PRIORITIES LIST SITE

FIGURE 4-1
SILVER DYKE ADIT
AVERAGE FLOW

TETRA TECH

CAD DRAWING BY DOUG HEROLD TTEMI-HELENA - Figure_4-1_Silver Dyke Average Flow.dwg - 04/28/2015

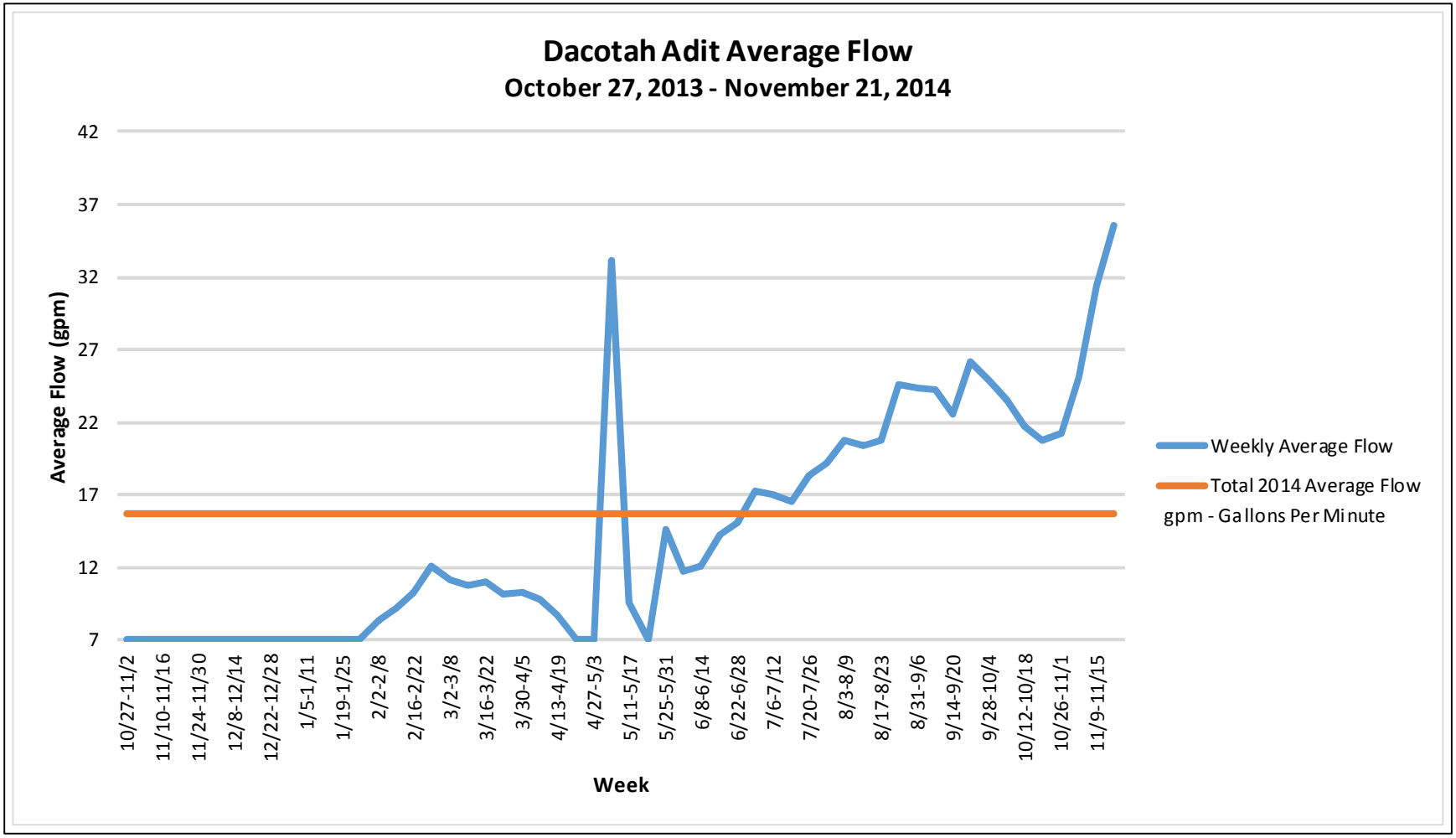


CARPENTER-SNOW CREEK MINING DISTRICT
NATIONAL PRIORITIES LIST SITE

FIGURE 5-1
COMPROMISE SHAFT
AVERAGE FLOW

TETRA TECH

CAD DRAWING BY DOUG HEROLD TTEMI-HELENA - Figure_5-1_Compromise Average Flow.dwg - 04/28/2015

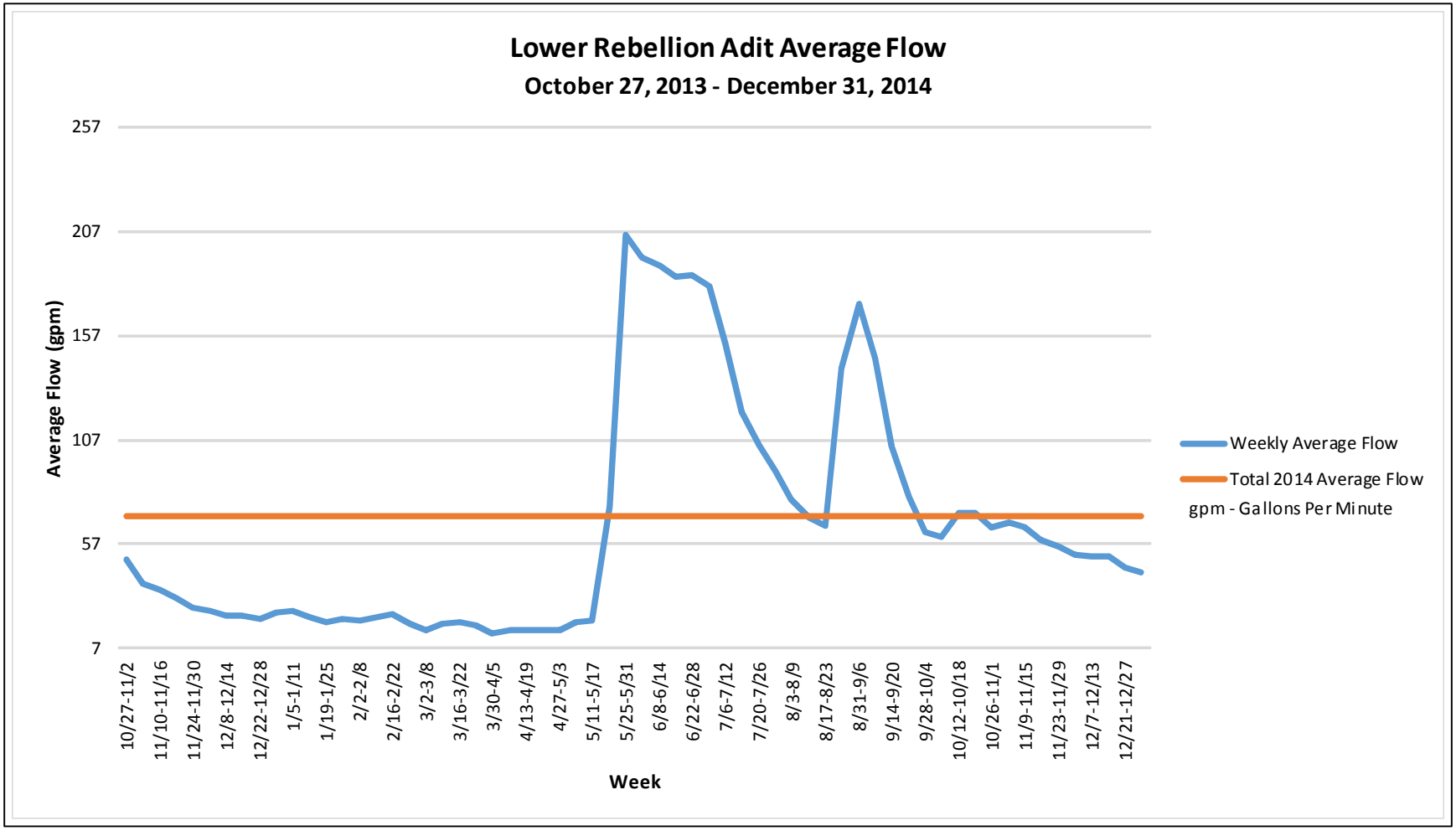


CARPENTER-SNOW CREEK MINING DISTRICT
NATIONAL PRIORITIES LIST SITE

FIGURE 6-1
DACHOTAH ADIT
AVERAGE FLOW

TETRA TECH

CAD DRAWING BY DOUG HEROLD TTEMI-HELENA - Figure_6-1_Dacotah Average Flow.dwg - 04/28/2015



CARPENTER-SNOW CREEK MINING DISTRICT
NATIONAL PRIORITIES LIST SITE

FIGURE 7-1
LOWER REBELLION ADIT
AVERAGE FLOW

TETRA TECH

CAD DRAWING BY DOUG HEROLD TTEMI-HELENA - Figure_7-1_Lower Rebellion Average Flow.dwg - 04/28/2015

TABLES

TABLE 4-1
ADIT FLOW WEEKLY AVERAGES

Year	Week	Silver Dyke Average Flow (gpm)	Compromise Average Flow (gpm)	Dacotah Average Flow (gpm)	Lower Rebellion Average Flow (gpm)	Yellow Jacket Average Flow (gpm)
2013	10/27-11/2	9	15	<7.3	50	NM
	11/3-11/9	9	14	<7.3	39	NM
	11/10-11/16	10	13	<7.3	35	NM
	11/17-11/23	9	9	<7.3	31	NM
	11/24-11/30	9	8	<7.3	27	NM
	12/1-12/7	8	11	<7.3	25	NM
	12/8-12/14	<7.3	9	<7.3	23	NM
	12/15-12/21	8	9	<7.3	23	NM
	12/22-12/28	7	<7.3	<7.3	21	NM
	12/29-1/4	8	9	<7.3	25	NM
2014	1/5-1/11	8	9	<7.3	25	NM
	1/12-1/18	<7.3	<7.3	<7.3	22	NM
	1/19-1/25	<7.3	<7.3	<7.3	20	NM
	1/26-2/1	7	9	<7.3	21	NM
	2/2-2/8	<7.3	10	<7.3	21	NM
	2/9-2/15	8	<7.3	<7.3	22	NM
	2/16-2/22	10	<7.3	<7.3	23	NM
	2/23-3/1	17	11	10	19	NM
	3/2-3/8	18	<7.3	10	16	NM
	3/9-3/15	15	9	10	19	NM
	3/16-3/22	13	11	10	20	NM
	3/23-3/29	12	10	8	18	NM
	3/30-4/5	10	8	10	15	NM
	4/6-4/12	10	16	10	16	NM
	4/13-4/19	<7.3	19	8	16	NM
	4/20-4/26	18	22	<7.3	16	NM
	4/27-5/3	32	19	8	16	NM
	5/4-5/10	44	29	12	20	NM
	5/11-5/17	33	15	10	21	NM
	5/18-5/24	78	14	<7.3	75	NM
	5/25-5/31	154	12	15	205	NM
	6/1-6/7	77	25	12	195	NM
	6/8-6/14	50	25	12	191	NM
	6/15-6/21	35	20	15	186	NM
	6/22-6/28	31	17	15	186	NM
	6/29-7/5	26	17	18	181	NM
	7/6-7/12	22	17	17	153	NM
	7/13-7/19	19	17	16	121	NM
	7/20-7/26	18	9	18	104	NM
	7/27-8/2	17	<7.3	20	92	NM
	8/3-8/9	18	<7.3	21	79	NM
	8/10-8/16	18	<7.3	21	70	NM
	8/17-8/23	21	<7.3	21	66	NM
	8/24-8/30	57	11	25	142	NM
	8/31-9/6	38	18	25	173	NM
	9/7-9/13	24	16	25	146	NM
	9/14-9/20	20	14	23	105	NM
	9/21-9/27	NM	10	26	80	NM
	9/28-10/4	NM	<7.3	25	63	NM
	10/5-10/11	NM	<7.3	24	61	NM
	10/12-10/18	NM	<7.3	22	72	NM
	10/19-10/25	NM	<7.3	21	72	NM
	10/26-11/1	24	<7.3	22	65	NM
	11/2-11/8	22	12	25	68	NM
	11/9-11/15	27	15	32	65	NM
	11/16-11/22	23	11	36	59	NM
	11/23-11/29	19	12	NM	56	<7.3*
	11/30-12/6	17	10	NM	53	<7.3
	12/7-12/13	15	11	NM	51	<7.3
	12/14-12/20	15	13	NM	52	<7.3
	12/21-12/27	15	13	NM	46	<7.3
	12/28-12/31	14	13	NM	44	<7.3
Total 2014 Average		25	11	16	71	<7.3

Notes:

* Hanna multi-parameter sonde was moved from the Dacotah Adit on 11/1/2014 to the Yellow Jacket Adit at the Moulton Mine on 11/25/14.

gpm gallons per minute

At a water level of 1 inch (0.083 ft), the accuracy of the flow measurement is uncertain. An average velocity at 1 inch was determined and used to calculate an accurate minimum flow detectable by the meter.

<7.3 Minimum calculated accurate flow. All weekly average flows under 7.3gpm are noted as <7.3gpm.

< Less than

NM Not Measured

TABLE 4-2
SILVER DYKE ADIT ANALYTICAL RESULTS FOR 2014

Sample ID		CCSD-AD-L-030	CCSD-AD-L-031	CCSD-AD-L-032	CCSD-AD-L-032	CCSD-AD-L-033	CCSD-AD-L-034	CCSD-AD-L-034	CCSD-AD-L-034D	CCSD-AD-L-034D	CCSD-AD-L-035	CCSD-AD-L-036	CCSD-AD-L-036	CCSD-AD-L-037	CCSD-AD-L-038	CCSD-AD-L-038	CCSD-AD-L-039	CCSD-AD-L-040	CCSD-AD-L-040	CCSD-AD-L-041	CCSD-AD-L-042	CCSD-AD-L-042	CCSD-AD-L-043	CCSD-AD-L-044	CCSD-AD-L-044	CCSD-AD-L-045	CCSD-AD-L-046	CCSD-AD-L-046	CCSD-AD-L-047	CCSD-AD-L-048	CCSD-AD-L-048	CCSD-AD-L-049	CCSD-AD-L-050	CCSD-AD-L-050	CCSD-AD-L-051	CCSD-AD-L-052	CCSD-AD-L-052	
Date		1/29/2014	2/20/2014	3/31/2014	3/31/2014	4/16/2014	5/1/2014	5/1/2014	5/1/2014	5/1/2014	5/14/2014	5/21/2014	5/21/2014	5/30/2014	6/5/2014	6/5/2014	6/12/2014	6/18/2014	6/18/2014	6/27/2014	7/10/2014	7/10/2014	7/23/2014	8/5/2014	8/5/2014	8/21/2014	9/3/2014	9/3/2014	9/18/2014	10/1/2014	10/1/2014	10/14/2014	10/30/2014	10/30/2014	12/5/2014	12/22/2014	12/22/2014	
Analysis		Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Dissolved Metals	Total Metals	Dissolved Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Dissolved Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	
Aluminum	(µg/L)	1080 D	1210 D	1170 D	1230 D	1610 D	1610 D	1660 D	1590 D	1590 D	1840 D	2200	2340 D	2300 D	1280	1590 D	1120 D	816 D	1010 D	910 D	685 D	930 D	948 D	792 D	940 D	912 D	1070 D	1130 D	1510 D	1480 D	1540 D	1250 D	1190 D	1300 D	1240 D	1190 D	1310 D
Antimony	(µg/L)	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<2.50 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<2.50 U	<5.00 U	<5.00 U	<5.00 U	<2.50 U	<2.50 U	<2.50 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<2.50 U	<5.00 U	<2.50 U
Arsenic	(µg/L)	7.87 JD	7.12 JD	<5.00 U	<5.00 U	2.56 JD	<5.00 U	<5.00 U	<5.00 U	<5.00 U	3.36 JD	<5.00 U	<5.00 U	<5.00 U	4.52 JD	4.10 JD	3.48 JD	<5.00 U	<5.00 U	5.51 JD	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	5.56 JD	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	4.88 JD	<5.00 U	<2.50 U
Barium	(µg/L)	<50.0 U	<50.0 U	<50.0 U	<50.0 U	<25.0 U	<50.0 U	<50.0 U	<50.0 U	<50.0 U	<25.0 U	<50.0 U	<50.0 U	<50.0 U	<25.0 U	<25.0 U	<25.0 U	<50.0 U	<50.0 U	<50.0 U	<50.0 U	<50.0 U	<50.0 U	<50.0 U	<50.0 U	<50.0 U	<50.0 U	<50.0 U	<50.0 U	<50.0 U	<50.0 U	<50.0 U	<50.0 U	<50.0 U	<25.0 U	<50.0 U	<25.0 U
Beryllium	(µg/L)	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<20.0 U	<20.0 U	<20.0 U	<10.0 U	<10.0 U	<10.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<10.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<10.0 U	<10.0 U	<10.0 U
Cadmium	(µg/L)	734 D	698 D	713 D	727 D	746 D	660 D	683 D	654 D	671 D	501 D	620 D	648 D	626 D	609 D	610 D	616 D	647 D	609 D	634 D	619 D	636 D	641 D	660 D	645 D	650 D	728 D	653 D	762 D	765 D	746 D	764 D	722 D	749 D	700 D	710 D	715 D
Calcium	(µg/L)	358000 D	364000 D	343000 D	357000 D	343000 D	284000 D	278000 D	282000 D	281000 D	261000 D	262000	261000 D	291000 D	329000	311000 D	334000 D	338000 D	358000 D	345000 D	346000 D	343000 D	346000 D	338000 D	341000 D	327000 D	299000 D	301000 D	321000 D	317000 D	321000 D	333000 D	335000 D	344000 D	346000 D	337000 D	364000 D
Chloride	(µg/L)	9300 JD	9300 JD	NM	87300 JD	<50000 U	NM	9400 JD	NM	8400 JD	7200 JD	NM	800 J	800 J	NM	7700 JD	<50000 U	NM	7220 JD	7100 JD	NM	7220 JD	5600 JD	NM	5600 JD	5600 JD	NM	5900 JD	<5000 U	NM	11000 JD	10900 JD	NM	<5000 U	<5000 U	NM	<5000 UJ
Chromium	(µg/L)	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<5.00 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<5.00 U	<10.0 U	<10.0 U	<10.0 U	<5.00 U	<5.00 U	<5.00 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 UJ	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<5.00 U	<10.0 U	<5.00 U
Cobalt	(µg/L)	254 D	240 D	258 D	268 D	266 D	210 D	218 D	201 D	213 D	173 D	188 D	206 D	208 D	222 D	212 D	229 D	245 D	230 D	226 D	215 D	212 D	211 D	226 D	218 D	220 D	244 D	211 D	261 D	261 JD	246 D	266 D	248 D	235 D	243 D	246 D	247 D
Copper	(µg/L)	5200 D	4830 D	5140 D	5400 D	9620 D	9670 D	9580 D	9460 D	9790 D	6820 D	9630 D	9990 D	6140 D	4470 D	4070 D	3270 D	3140 D	2770 D	2400 D	2170 D	2220 D	2430 D	2760 D	2530 D	2750 D	5190 D	4420 D	9110 D	8620 D	8250 D	7470 D	6040 D	5410 D	4980 D	4900 D	4940 D
Hardness	(µg/L)	NM	NM	1410000 D	NM	NM	1190000 D	NM	1180000 D	NM	NM	1100000	NM	NM	1330000	NM	NM	1380000 D	NM	NM	1420000 D	NM	NM	1370000 D	NM	NM	1240000 D	NM	NM	1350000 D	NM	1400000 D	NM	NM	1390000 D	NM	
Iron	(µg/L)	38900 D	36000 D	29800 D	33200 D	28000 D	25500 D	29400 D	25800 D	29600 D	33200 D	29800	34200 D	44300 D	44300	46900 D	50000 D	48600 D	52800 D	51200 D	48200 D	50600 D	51300 D	45300 D	49100 D	47300 D	39800 D	43100 D	39900 D	31600 D	36100 D	38200 D	36300 D	39500 D	39900 D	35300 D	40800 D
Lead	(µg/L)	713 D	726 D	604 D	665 D	782 D	811 D	833 D	793 D	804 D	1130 D	1100 D	1080 D	1000 D	819 D	999 D	872 D	804 D	812 D	966 D	729 D	956 D	855 D	704 D	820 D	816 D	793 D	836 D	778 D	638 D	695 D	734 D	635 D	779 D	774 D	727 D	780 D
Magnesium	(µg/L)	137000 D	139000 D	133000 D	138000 D	142000 D	117000 D	115000 D	116000 D	117000 D	106000 D	107000	111000 D	119000 D	123000	124000 D	129000 D	131000 D	138000 D	134000 D	135000 D	134000 D	134000 D	129000 D	132000 D	128000 D	120000 D	122000 D	137000 D	137000 D	137000 D	139000 D	138000 D	141000 D	138000 D	134000 D	146000 D
Manganese	(µg/L)	135000 D	133000 D	133000 D	136000 D	137000 D	114000 D	116000 D	114000 D	117000 D	101000 D	81500	108000 D	113000 D	87100	117000 D	126000 D	125000 D	129000 D	134000 D	132000 D	134000 D	130000 D	129000 D	129000 D	134000 D	129000 D	128000 D	154000 D	141000 D	151000 D	146000 D	143000 D	148000 D	135000 D	135000 D	145000 D
Nickel	(µg/L)	295 D	267 D	281 D	287 D	298 D	244 D	250 D	241 D	251 D	204 D	224 D	240 D	237 U	248 D	234 D	243 D	274 D	257 D	246 D	242 D	225 D	230 D	254 D	234 D	245 D	272 JD	233 D	295 D	291 JD	274 D	303 D	290 D	254 D	274 D	275 D	279 D
Potassium	(µg/L)	5000 D	4850 JD	4930 JD	5530 D	5220 D	4740 JD	5210 JD	4360 JD	4890 JD	4880 JD	4650	4570 JD	4670 JD	4970	4600 JD	4700 JD	4900 JD	5120 D	5610 JD	5180 JD	5240 JD	1.63	4810 JD	4980 JD	7030 JD	4490 JD	5210 JD	4920 JD	4670 JD	4430 JD	4700 JD	4940 JD	5990 JD	4980 JD	4850 JD	5690 D
Selenium	(µg/L)	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<5.00 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	5.95 JD	<10.0 U	<10.0 U	<10.0 U	<5.00 U	5.59 JD	6.84 JD	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	11.4 JD	<10.0 U	9.54 JD	10.5 JD	6.71 JD
Silver	(µg/L)	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<2.50 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<2.50 U	<5.00 U	<5.00 U	<5.00 U	<2.50 U	<2.50 U	<2.50 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	8.26 JD	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<2.50 U	<5.00 U	<2.50 U
Sodium	(µg/L)	7100 D	7210 D	7150 D	7650 D	7440 D	5950 JD	6220 JD	5890 JD	6020 JD	5770 D	5680	5780 D	6260 D	6670	6400 D	6800 D	7000 D	7350 D	7360 JD	7190 JD	7170 JD	7210 D	6880 D	7040 D	7130 JD	6170 JD	6420 JD	6690 JD	6740 D	6540 JD	6900 JD	7160 JD	7260 JD	7130 D	6970 D	7550 D
Sulfate as SO4	(µg/L)	1960000 JD	2010000 D	NM	1860000 D	1760000 D	NM	1700000 D	NM	1650000 D	1670000 D	NM	165000	183000	NM	1910000 D	1670000 D	NM	2030000 D	2100000 D	NM	2120000 D	1920000 D	NM	1980000 D	1930000 D	NM	1850000 D	1890000 D	NM	1910000 D	1960000 D	NM	1940000 D	1900000 D	NM	1950000 JD
Thallium	(µg/L)	<5.00 U	5.91 JD	<5.00 U	<5.00 U	<2.50 U	<5.00 U	44.7 D	<5.00 U	15.9 D	6.06 D	<5.00 U	<5.00 U	<5.00 U	<2.50 U	<2.50 U	4.91 JD	<5.00 U	15.1 D	<5.00 U	<5.00 U	10.3 D	5.62 JD	<5.00 U	6.64 JD	<5.00 U	<5.00 U	9.33 JD	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<2.50 U	<5.00 U	<2.50 U
Vanadium	(µg/L)	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<10.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<10.0 U	<20.0 U	<20.0 U	<20.0 U	<10.0 U	<10.0 U	<10.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 UJ	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<10.0 U	<20.0 U	<10.0 U
Zinc	(µg/L)	142000 D	139000 D	141000 D	145000 D	136000 D	117000 D	119000 D	117000 D	120000 D	107000 D	104000	112000 D	116000 D	113000	125000 D	134000 D	135000 D	139000 D	139000 D	138000 D	139000 D	140000 D	140000 D	139000 D	139000 D	133000 D	131000 D	152000 D	145000 D	148000 D	143000 D	143000 D	149000 D	140000 D	139000 D	147000 D

Notes:

CCSD	Carpenter Creek Silver Dyke	D	The reported value is from a dilution
AD	Adit Discharge	U	Element was analyzed for but not detected above the Method Detection Limit
L	Laboratory	J	Estimated because quality control criteria were not met
D	D in the sample name is a duplicate	B	Value was less than the Contract Required Detection Limit but greater than the Instrument Detection Limit
µg/L	micrograms per liter	NM	Not Measured
<	less than the detection limit		

Table 4-3
Weekly Water Quality and Flow Averages for Silver Dyke Adit in 2014

Week in 2014	Temperature ºC	pH	ORP mV	SpCond µS/cm	DOsat %	DO mg/L	Flow gpm
5/4-5/10	7.25*	3.81*	340.9*	2166.2*	31.70*	3.80*	44
5/11-5/17	7.32	4.21	305.9	2101.5	33.70	4.03	33
5/18-5/24	7.57	4.07	314.0	1969.8	33.32	3.97	78
5/25-5/31	8.35	4.29	273.2	2065.5	25.34	2.96	154
6/1-6/7	8.57	4.96	221.2	2516.2	21.52	2.49	77
6/8-6/14	8.72	5.06	217.4	2620.7	20.95	2.42	50
6/15-6/21	8.78	5.23	210.6	2678.4	21.14	2.44	35
6/22-6/28	8.84	5.22	217.5	2686.8	21.94	2.52	31
6/29-7/5	8.88	5.23	212.1	2705.6	23.17	2.66	26
7/6-7/12	9.06	5.19	212.2	2689.1	23.89	2.73	22
7/13-7/19	9.22	5.34	176.1	2225.7	19.23	2.05	19
7/20-7/26	9.37	4.99	156.5	1823.4	10.33	0.93	18
7/27-8/2	9.41	4.35	189.3	1872.4	8.33	0.75	17
8/3-8/9	9.47	4.24	193.8	2379.7	2.55	0.23	18
8/10-8/16	9.45	4.04	200.4	3102.0	0.64	0.06	18
8/17-8/23	9.14	3.82	214.1	2968.1	0.18	0.02	21
8/24-8/30	9.04	3.53	276.5	2104.8	0.05	0.00	57
8/31-9/6	8.95	3.47	329.8	2768.2	0.00	0.00	38
9/7-9/13	8.66	3.19	376.5	2757.9	0.00	0.00	24
9/14-9/20	8.61**	2.62**	463.3**	2383.6**	0.00**	0.00*	20
AVERAGE	8.73	4.51***	255.06	2429.28	15.68	1.79	25***

Field Parameters Taken at Time of Grab Sample**						
Sample Date	Time	Temp ºC	pH	ORP mV	SpCond µs/cm	DO mg/L
10/1/2014	1610	8.70	4.62	254.0	2766	3.70
10/14/2014	1030	8.70	5.11	46.0	2772	3.70
10/30/2014	1610	8.73	5.50	109.4	2704	4.19
12/5/2014	1210	8.50	5.28	66.8	2740	4.50
12/22/2014	1200	8.49	5.34	85.4	2444	4.04

Notes:

* On 5/8 the Sonde was installed at the Silver Dyke. Water Quality Parameters are representative from 5/8 to 9/15
On 7/16 a new Sonde was installed.
On 8/19 DO Measurements were 0.00 with very few fluctuations above 0.00 for the rest of the installation period
** On 9/15 the Aquafix was installed at the Silver Dyke, the Sonde was moved. Field Parameters were taken with grab samples after this date
***Flow Average based on data from the entire year, not just the weeks represented in this table. pH average based on average of weekly averages and field parameter measurements

ORP	Oxidation Reduction Potential	mV	millivolts
SpCond	Specific Conductivity	µS/cm	microSiemens per centimeter
DOsat	Dissolved Oxygen saturated	mg/L	milligrams per liter
DO	Dissolved Oxygen	gpm	gallons per minute
ºC	degrees Celcius	%	percent

TABLE 5-1
COMPROMISE SHAFT ANALYTICAL RESULTS FOR 2014

Sample ID		NSCO-AD-L-012	NSCO-AD-L-013	NSCO-AD-L-014	NSCO-AD-L-014	NSCO-AD-L-015	NSCO-AD-L-016	NSCO-AD-L-016	NSCO-AD-L-017	NSCO-AD-L-018	NSCO-AD-L-018	NSCO-AD-L-019	NSCO-AD-L-020	NSCO-AD-L-020	NSCO-AD-L-021	NSCO-AD-L-022	NSCO-AD-L-022	NSCO-AD-L-023	NSCO-AD-L-024	NSCO-AD-L-024	NSCO-AD-L-025	NSCO-AD-L-026	NSCO-AD-L-026	NSCO-AD-L-027	NSCO-AD-L-028	NSCO-AD-L-028	NSCO-AD-L-029	NSCO-AD-L-30	NSCO-AD-L-30	NSCO-AD-L-300	NSCO-AD-L-300	NSCO-AD-L-31	NSCO-AD-L-32	NSCO-AD-L-32	NSCO-AD-L-33	NSCO-AD-L-34	NSCO-AD-L-34
Date		1/30/2014	2/20/2014	3/31/2014	3/31/2014	4/16/2014	4/28/2014	4/28/2014	5/14/2014	5/21/2014	5/21/2014	5/30/2014	6/5/2014	6/5/2014	6/12/2014	6/18/2014	6/18/2014	6/27/2014	7/10/2014	7/10/2014	7/23/2014	8/5/2014	8/5/2014	8/21/2014	9/3/2014	9/3/2014	9/18/2014	10/1/2014	10/1/2014	10/1/2014	10/1/2014	10/14/2014	10/30/2014	10/30/2014	11/25/2014	12/22/2014	12/22/2014
Analysis		Total Metals	Total Metals	Dissolved Metals	Total Metals	Dissolved Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Dissolved Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals
Aluminum	(µg/L)	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	41.8 J	24.4 J	20.6 J	21.8 J	20.6 J	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	20.3 J	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	28.2 J	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	24.8 J	26.8 J
Antimony	(µg/L)	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<5.00 U	<2.50 U	<0.500 U	<2.50 U
Arsenic	(µg/L)	3.18 JD	<2.50 U	1.01 J	<2.50 U	<2.50 U	1.25 J	<2.50 U	2.82 JD	1.33 J	<2.50 U	<2.50 U	2.53 JD	<2.50 U	<2.50 U	1.25 J	<2.50 U	<2.50 U	1.43 J	<2.50 U	<2.50 U	1.01 J	<2.50 U	<2.50 U	1.44 J	<2.50 U	<2.50 U	1.02 J	<2.50 U	1.01 J	<2.50 U	<2.50 U	1.07 J	<5.00 U	<2.50 U	1.08 J	<2.50 U
Barium	(µg/L)	<25.0 U	<25.0 U	11.1	<25.0 U	<25.0 U	12.8	<25.0 U	<25.0 U	10.3 J	<25.0 U	<25.0 U	<25.0 U	<25.0 U	<25.0 U	10.6	<25.0 U	<25.0 U	12.9	<25.0 U	<25.0 U	12.3	<25.0 U	<25.0 U	13.1	<25.0 U	<25.0 U	11.9	<25.0 U	12.2	<25.0 U	<25.0 U	12.2	<50.0 U	<25.0 U	9.39 J	<25.0 U
Beryllium	(µg/L)	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U
Cadmium	(µg/L)	3.94 D	3.80 D	3.72	3.75 D	4.35 D	13.8	13.5 D	11.5 D	7.42	8.57 D	8.01 D	7.64 D	6.96 D	7.17 D	6.37	6.52 D	5.38 D	5.20	4.79 D	4.88 D	4.80	4.63 D	4.09 D	6.86	4.90 D	4.94 D	4.80	4.72 D	4.91	4.61 D	4.41 D	4.98	7.78 D	4.46 D	3.75	3.62 D
Calcium	(µg/L)	59600	60000	58200	61700	58500	64400	65200	62800	59500	60300	58000	57800	55600	59100	57700	57400	59000	56900	56800	57600	56300	55100	55000	53500	53300	57300	54500	54200	54700	55100	56200	57100	56800	56700	55100	57600
Chloride	(µg/L)	8700 JD	8700 JD	NM	8900 JD	8900 JD	NM	8900 JD	7400 JD	NM	7300 JD	7300 JD	NM	7200 JD	5400 JD	NM	<5000 U	6500 JD	NM	7000 JD	<5000 U	NM	<5000 U	800 J	NM	800 J	<5000 U	NM	10400 JD	NM	10300 JD	10300 JD	NM	<5000 U	<500 U	NM	<500 U
Chromium	(µg/L)	<5.00 U	<5.00 U	2.01	<5.00 U	<5.00 U	2.91	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<1.00 UJ	<5.00 U	<5.00 U	<1.00 U	<10.0 U	<5.00 U	<1.00 U	<5.00 U
Cobalt	(µg/L)	20.2 D	20.7 D	20.5	21.8 D	21.4 D	25.6	25.5 D	24.3 D	17.7	22.6 D	20.6 D	21.5 D	20.8 D	22.3 D	20.3	21.2 D	18.6 D	17.7	18.3 D	18.5 D	17.6	18.2 D	17.5 D	19.2	16.6 D	19.3 D	19.8	19.1 D	18.5 J	19.5 D	18.8 D	16.9	35.5 D	18.9 D	18.6	19.8 D
Copper	(µg/L)	<2.50 U	<2.50 U	1.16	<2.50 U	<2.50 U	3.29	5.43 D	2.64 JD	1.01	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	1.06	<2.50 U	<2.50 U	0.842 J	<2.50 U	<2.50 U	0.943 J	<2.50 U	<2.50 U	0.834 J	<2.50 U	<2.50 U	1.64	<2.50 U	1.49 J	<2.50 U	<2.50 U	1.45	<5.00 U	<2.50 U	1.53	<2.50 U
Hardness	(µg/L)	NM	NM	290000	NM	NM	321000	NM	NM	303000	NM	NM	291000	NM	NM	293000	NM	NM	288000	NM	NM	284000	NM	NM	269000	NM	NM	276000	NM	278000	NM	NM	288000	NM	NM	277000	NM
Iron	(µg/L)	6110	4130	3860	4760	4520	3510	5430	5430	3280	5120	5240	3990	4970	4400	3910	4420	3980	4030	4880	4340	3410	3910	5550	3940	4750	4150	3420	3710	3500	3790	4320	3730	4260	4180	3820	5060
Lead	(µg/L)	63.7 D	11.5 D	2.52	18.1 D	33.1 D	0.626	62.9 D	61.6 D	1.47	52.3 D	52.1 D	14.2 D	54.6 D	19.6 D	1.26	22.6 D	13.9 D	1.49	34.3 D	16.4 D	0.214	12.5 D	42.3 D	3.50 J	35.9 D	19.6 D	1.58	11.5 D	1.31	11.6 D	22 D	1.36	43.7 D	18.8 D	0.160 J	29.2 D
Magnesium	(µg/L)	36000	36200	35000	36600	35600	38800	39600	38700	37600	37500	35800	35700	34900	36700	36200	35400	36900	35400	35600	35700	34800	34100	34400	33000	32700	35300	34100	33500	34400	33800	34700	35300	34800	35000	33800	35100
Manganese	(µg/L)	16400	16600	16400	16800	15700	22000	22000	20100	18500	18700	17600	17200	17000	17500	17100	17200	16800	16200	16300	16300	16100	16100	15300	16100	15800	16900	16100	16000	16200	16200	16100	16100	16000	15700	15100	15900
Nickel	(µg/L)	67.2 D	68.0 D	69.3	71.2 D	70.4 D	78.8	79.5 D	82.6 D	60.2	72.8 D	69.2 D	70.7 D	68.9 D	70.6 D	68	67.4 D	59.9 D	58.8	60.2 D	60.6 D	57.1	59.9 D	57.2 D	60.9	55.6 D	64.2 D	64.2	63.5 D	60.9 J	62.4 D	65.4 D	53.2	114 D	63.8 D	60.9	64.1 D
Potassium	(µg/L)	2030	2050	2060	2130	2050	2090	2170	2160	2120	2120	2080	2000	1990	2090	2060	1990	2090	2020	2040	2100	1960	2060	2130	1910	1990	2050	1950	1890	2000	1890	1970	2030	2030	1990	1930	2020
Selenium	(µg/L)	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<10.0 U	<5.00 U	<1.00 U	<5.00 U
Silver	(µg/L)	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<5.00 U	<2.50 U	<0.500 U	<2.50 U
Sodium	(µg/L)	2970	2980	2980	3160	3050	3150	3230	3190	3170	3110	3050	2990	2940	3080	3060	2990	3130	3010	3060	3020	2920	2890	3070	2770	2840	3010	2950	2750	3010	2760	2960	3070	3010	2930	2860	2950
Sulfate as SO4	(µg/L)	270000 JD	269000 D	NM	257000 D	251000 D	NM	307000 D	314000 D	NM	290000 D	271000 D	NM	259000 D	252000 D	NM	262000 D	270000 D	NM	261000 D	250000 D	NM	251000 D	235000	NM	255000 E	247000 D	NM	223000 D	NM	222000 D	227000 D	NM	227000 D	250000	NM	260000 J
Thallium	(µg/L)	7.80 D	8.07 D	6.47	7.46 D	12.7 D	7.55	8.11 D	7.76 D	7.18	11.5 D	12.2 D	7.72 D	7.81 JD	6.53 D	8.19	6.27 D	6.85 D	7.79	7.63 D	6.68 D	6.87	6.56 D	6.16 D	8.27 J	5.92 D	7.92 D	6.68	6.58 D	6.75	6.75 D	7.36 D	7.64	15.1 D	12.2 D	7.37	7.20 D
Vanadium	(µg/L)	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<2.00 UJ	<10.0 U	<10.0 U	<2.00 U	<20.0 U	<10.0 U	<2.00 U	<10.0 U
Zinc	(µg/L)	3980	3930	4080	4110	3840	7540	7330	6540	5910	5790	5240	5150	4960	5060	5150	4830	4660	4530	4390	4300	4390	4090	3930	4890	4240	4410	4500	4210	4560	4250	4110	4470	4040	3970	3770	3920

Notes:

NSCO	Neihart Slope Compromise	D	The reported value is from a dilution
AD	Adit Discharge	U	Element was analyzed for but not detected above the Method Detection Limit
L	Laboratory	J	Estimated because quality control criteria were not met
D	D in the sample name is a duplicate	B	Value was less than the Contract Required Detection Limit but greater than the Instrument Detection Limit
µg/L	micrograms per liter	NM	Not Measured
<	less than the detection limit		

TABLE 5-2
COMPOMISE SHAFT WATER QUALITY PARAMETERS

Field Parameters Taken at Time of Grab Sample						
Sample Date	Time	Temp ºC	pH	ORP mV	SpCond µs/cm	DO mg/L
6/5/2014	1030	8.26	5.04	159.0	651	11.60
6/12/2014	1435	9.72	6.61	76.0	653	10.50
6/18/2014	1050	7.00	6.39	152.4	656	5.50
6/27/2014	1045	7.92	6.74	14.5	648	5.56
7/10/2014	1055	9.12	7.25	24.2	643	5.51
7/23/2014	1110	9.82	7.10	11.4	633	4.80
8/5/2014	1205	11.92	6.92	22.3	310	5.24
8/21/2014	1230	9.55	7.43	36.8	616	5.48
9/3/2014	1040	7.14	7.43	30.2	563	4.51
9/18/2014	935	7.36	7.46	38.0	642	5.86
10/1/2014	910	6.46	6.91	99.0	631	6.33
10/14/2014	1500	8.15	7.30	32.0	623	6.34
10/30/2014	1330	7.49	7.69	9.1	618	6.95
11/25/2014	1035	4.33	7.60	36.6	628	7.65
12/22/2014	1515	3.30	7.68	-5.7	614	7.40
AVERAGE		7.84	7.04	49.05	608.60	5.93*

Notes:
*DO Average does not include June 5 or June 12, 2014 DO measurements due to inconsistency in all DO measurements at each adit on those dates.

Temp	temperature	ºC	degrees Celcius
SpCond	Specific Conductivity	µS/cm	micro-Siemens per centimeter
ORP	Oxidation/Reduction Potential	mV	millivolts
DO	Dissolved Oxygen	mg/L	milligrams per liter

TABLE 6-1
DACOTAH ADIT ANALYTICAL RESULTS FOR 2014

Sample ID		NSDC-AD-L-011	NSDC-AD-L-012	NSDC-AD-L-013	NSDC-AD-L-013	NSDC-AD-L-014	NSDC-AD-L-015	NSDC-AD-L-015	NSDC-AD-L-016	NSDC-AD-L-017	NSDC-AD-L-017	NSDC-AD-L-018	NSDC-AD-L-019	NSDC-AD-L-019	NSDC-AD-L-020	NSDC-AD-L-021	NSDC-AD-L-021	NSDC-AD-L-022	NSDC-AD-L-023	NSDC-AD-L-023	NSDC-AD-L-023	NSDC-AD-L-024	NSDC-AD-L-025	NSDC-AD-L-025	NSDC-AD-L-026	NSDC-AD-L-027	NSDC-AD-L-027	NSDC-AD-L-028	NSDC-AD-L-29	NSDC-AD-L-29	NSDC-AD-L-29D	NSDC-AD-L-29D	NSDC-AD-L-30	NSDC-AD-L-31	NSDC-AD-L-31	NSDC-AD-L-32
Date		1/29/2014	2/20/2014	3/31/2014	3/31/2014	4/16/2014	4/28/2014	4/28/2014	5/14/2014	5/21/2014	5/21/2014	5/30/2014	6/5/2014	6/5/2014	6/12/2014	6/18/2014	6/18/2014	6/27/2014	6/27/2014	7/10/2014	7/10/2014	7/23/2014	8/5/2014	8/5/2014	8/21/2014	9/3/2014	9/3/2014	9/18/2014	10/1/2014	10/1/2014	10/1/2014	10/1/2014	10/14/2014	10/30/2014	10/30/2014	11/21/2014
Analysis		Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Total Metals	Total Metals	Total Metals
Aluminum	(µg/L)	1190 D	1030 D	963 D	928 D	859 D	3940 D	4090 D	6540 D	5330 D	5390 D	5110 D	4550 D	4440 D	4340 D	11300 D	3810 D	3470 D	3510 D	2880 D	3020 D	2300 D	1910 D	1980 D	1640 D	3750 D	3660 D	3210 D	2490 D	2510 D	2440 D	2500 D	2180 D	1830 D	1840 D	1630 D
Antimony	(µg/L)	<5.00 U	<5.00 U	<2.50 U	<2.50 U	<2.50 U	<5.00 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<2.50 U	<2.50 U	<5.00 U	<2.50 U	<5.00 U	<2.50 U	<2.50 U	<5.00 U	<2.50 U
Arsenic	(µg/L)	6.83 JD	9.74 JD	4.20 JD	4.11 JD	2.83 JD	5.29 JD	6.03 JD	8.95 JD	10.5 D	10.2 D	6.08	5.10 JD	6.65 JD	5.54 JD	4.92 JD	3.95 JD	5.28 JD	4.76 JD	5.95 JD	9.77 JD	6.48 JD	5.25 JD	7.71 JD	6.07 JD	8.96 JD	7.76 JD	5.31 JD	5.20 JD	5.15 JD	4.25 JD	<5.00 U	5.82 JD	5.84 JD	12.9 JD	7.94 JD
Barium	(µg/L)	<50.0 U	<50.0 U	<25.0 U	<25.0 U	<25.0 U	<50.0 U	<25.0 U	<25.0 U	<25.0 U	<25.0 U	<25.0	<25.0 U	<25.0 U	<25.0 U	<25.0 U	<25.0 U	<25.0 U	<25.0 U	<25.0 U	<25.0 U	<50.0 U	<50.0 U	<50.0 U	<50.0 U	<50.0 U	<50.0 U	<25.0 U	<25.0 U	<50.0 U	<25.0 U	<50.0 U	<25.0 U	<25.0 U	<50.0 U	<25.0 U
Beryllium	(µg/L)	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0	2.50 J	<10.0 U	<10.0 U	99.9 D	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<20.0 U	<20.0 U	<20.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U
Cadmium	(µg/L)	156 D	145 D	133 D	136 D	122 D	270 D	280 D	410 D	378 D	344 D	348	346 D	343 D	344 D	322 D	314 D	296 D	292 D	279 D	275 D	259 D	237 D	229 D	201 D	326 D	285 D	270 D	233 D	234 D	239 D	239 D	229 D	220 D	200 D	405 D	180 D
Calcium	(µg/L)	119000 D	114000 D	111000 D	112000 D	108000 D	110000 D	111000 D	105000 D	76500 D	78400 D	104000	117000	113000 D	132000 D	348000 D	131000 D	138000 D	137000 D	138000 D	142000 D	136000 D	136000 D	135000 D	126000 D	127000 D	121000 D	126000 D	121000 D	125000 D	121000 D	126000 D	133000 D	127000 D	129000 D	126000 D
Chloride	(µg/L)	8700 JD	8700 JD	NM	8900 JD	8800 JD	NM	8800 JD	7300 JD	NM	7400 JD	7200	NM	7300 JD	5400 JD	NM	<5000 U	6700 JD	6500 JD	NM	6600 JD	<5000 U	NM	5100 JD	5100 JD	NM	5200 JD	<5000 U	NM	10400 JD	NM	10400 JD	10400 JD	NM	<5000 U	<5000 U
Chromium	(µg/L)	<10.0 U	<10.0 U	<5.00 U	<5.00 U	<5.00 U	<10.0 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<5.00 U	<5.00 UJ	<10.0 U	<5.00 U	<10.0 U	<5.00 U	<5.00 U	<10.0 U	<5.00 U
Cobalt	(µg/L)	104 D	96.8 D	97.4 D	100 D	98.2 D	122 D	127 D	105 D	89.0 D	80.8 D	104	118 D	116 D	134 D	132 D	130 D	111 D	123 D	120 D	123 D	119 D	122 D	118 D	110 D	128 D	117 D	118 D	119 JD	120 D	121 D	113 D	115 D	102 D	208 D	108 D
Copper	(µg/L)	11.4 D	10.9 D	13.6 D	10.8 D	9.16 D	66.2 D	64.2 D	114 D	116 D	104 D	83.4	76.2 D	72.2 D	62.8 D	57.4 D	48.9 D	33.6 D	37.4 D	29.4 D	29.5 D	22.4 D	20.3 D	17.9 D	16.7 D	43.1 D	41.9 D	38.5 D	28.2 JD	25.8 D	30.2 D	26.0 D	22 D	18.0 D	37.7 D	22.8 D
Hardness	(µg/L)	NM	NM	523000 D	NM	NM	529000 D	NM	NM	360000 D	NM	NM	551000	NM	NM	1460000 D	NM	NM	NM	665000 D	NM	NM	650000 D	NM	NM	607000 D	NM	NM	589000 D	NM	587000 D	NM	NM	613000 D	NM	NM
Iron	(µg/L)	35200 D	31400 D	24600 D	29000 D	22600 D	34700 D	34400 D	47400 D	44600 D	45600 D	41500	37700 D	38300 D	40800 D	59000 D	38900 D	44800 D	45300 D	52800 D	64200 D	59100 D	58600 D	61300 D	57800 D	46200 D	46300 D	39100 D	41200 D	42000 D	40200 D	42600 D	47300 D	45400 D	46100 D	47900 D
Lead	(µg/L)	140 D	139 D	105 D	103 D	122 D	144 D	171 D	196 D	256 D	222 D	205	191 D	209 D	172 D	210 D	155 D	204 D	198 D	187 D	193 D	158 D	153 D	153 D	148 D	206 JD	173 D	172 D	151 D	163 D	151 D	162 D	158 D	156 D	324 D	140 D
Magnesium	(µg/L)	63600 D	60600 D	60000 D	60300 D	59000 D	61700 D	62600 D	55300 D	40900 D	41200 D	57100	63000	62500 D	73500 D	143000 D	72800 D	77300 D	77600 D	77600 D	79500 D	76500 D	75700 D	76000 D	71200 D	70600 D	68200 D	70000 D	69300 D	70300 D	69400 D	70200 D	74500 D	71500 D	72300 D	70400 D
Manganese	(µg/L)	92300 D	89000 D	82300 D	83900 D	78900 D	95800 D	96200 D	90600 D	70100 D	70500 D	90300	75900	97400 D	112000 D	124000 D	113000 D	116000 D	113000 D	115000 D	120000 D	116000 D	113000 D	113000 D	111000 D	112000 D	108000 D	110000 D	105000 D	106000 D	104000 D	107000 D	108000 D	104000 D	105000 D	99800 D
Nickel	(µg/L)	151 D	143 D	141 D	141 D	142 D	181 D	182 D	156 D	133 D	118 D	150	177 D	172 D	186 D	191 D	173 D	157 D	174 D	166 D	174 D	170 D	177 D	165 D	155 D	178 D	167 D	168 D	169 JD	167 D	175 D	157 D	161 D	144 D	286 D	155 D
Potassium	(µg/L)	1580 JD	1450 JD	1600 JD	1550 JD	1380 JD	<1250 U	1430 JD	<1250 U	<1250 U	<1250 U	<1250	1090	<1250 U	1300 JD	15800 D	1250 JD	1380 JD	1450 JD	1380 JD	1410 JD	1940 D	1570 JD	1370 JD	<2500 U	<2500 U	<2500 U	1290 JD	1270 JD	<1250 U	1270 JD	<1250 U	1440 JD	1520 JD	1630 JD	1540 JD
Selenium	(µg/L)	<10.0 U	<10.0 U	<5.00 U	<5.00 U	<5.00 U	<10.0 U	6.00 JD	5.96 JD	<5.00 U	<5.00 U	5.12	<5.00 U	5.93 JD	6.16 JD	8.03 JD	<5.00 U	5.06 JD	<5.00 UJ	7.00 JD	5.41 JD	<10.0 U	<10.0 U	<10.0 U	<10.0 U	10.1 JD	11.0 JD	<5.00 U	5.47 JD	<10.0 U	<5.00 U	<10.0 U	6.46 JD	6.62 JD	16.9 JD	6.48 JD
Silver	(µg/L)	<5.00 U	<5.00 U	<2.50 U	<2.50 U	<2.50 U	<5.00 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<2.50 U	<2.50 U	<5.00 U	<2.50 U	<5.00 U	<2.50 U	<2.50 U	<5.00 U	<2.50 U
Sodium	(µg/L)	2890 JD	2810 JD	3070 JD	3140 JD	3030 JD	2590 JD	2710 JD	2240 JD	1990 JD	1980 JD	2410	2510	2390 JD	2790 JD	18100 D	2780 JD	2900 JD	2920 JD	2940 JD	2980 JD	2940 JD	2920 JD	3020 JD	3060 JD	2680 JD	2760 JD	2790 JD	2860 JD	2780 JD	2920 JD	2740 JD	3110 JD	3030 JD	2980 JD	3060 JD
Sulfate as SO4	(µg/L)	983000 JD	977000 D	NM	884000 D	862000 D	NM	1070000 D	1120000 D	NM	888000 D	1070000	NM	1160000 D	1240000 D	NM	1300000 D	1370000 D	1420000 D	NM	1450000 D	1310000 D	NM	1280000 D	1240000 D	NM	1270000 D	1100000 D	NM	1120000 D	NM	1130000 D	1150000 D	NM	1130000 D	1090000 D
Thallium	(µg/L)	<5.00 U	<5.00 U	<2.50 U	<2.50 U	3.47 JD	<5.00 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<2.50 U	<2.50 U	<5.00 U	<2.50 U	<5.00 U	<2.50 U	<2.50 U	<5.00 U	3.09 JD
Vanadium	(µg/L)	<20.0 U	<20.0 U	<10.0 U	<10.0 U	<10.0 U	<20.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<10.0 U	<10.0 UJ	<20.0 U	<10.0 U	<20.0 U	<10.0 U	<10.0 U	<20.0 U	<10.0 U
Zinc	(µg/L)	107000 D	103000 D	95000 D	97300 D	87500 D	131000 D	126000 D	141000 D	118000 D	117000 D	137000	127000	139000 D	154000 D	133000 D	149000 D	154000 D	151000 D	150000 D	157000 D	145000 D	144000 D	139000 D	134000 D	147000 D	141000 D	141000 D	133000 D	132000 D	132000 D	131000 D	129000 D	124000 D	125000 D	115000 D

Notes:

NSDC	Neihart Slope Dacotah	D	The reported value is from a dilution
AD	Adit Discharge	U	Element was analyzed for but not detected above the Method Detection Limit
L	Laboratory	J	Estimated because quality control criteria were not met
D	D in the sample name is a duplicate	B	Value was less than the Contract Required Detection Limit but greater than the Instrument Detection Limit
µg/L	micrograms per liter	NM	Not Measured
<	less than the detection limit		

Table 6-2
Weekly Water Quality and Flow Averages for Dacotah Adit

Week	Temperature °C	pH	ORP mV	SpCond µS/cm	DOsat %	DO mg/L	Flow gpm
5/4-5/10	6.43*	2.85*	507.9*	1942.7*	39.06*	4.78*	33
5/11-5/17	6.41	2.88	537.3	1934.1	26.76	3.28	10
5/18-5/24	6.24	2.92	529.8	1668.5	38.18	4.70	<7.3
5/25-5/31	6.27	2.92	534.1	1840.4	21.94	2.70	15
6/1-6/7	6.29	2.95	536.2	2029.2	9.70	1.19	12
6/8-6/14	6.27	2.99	535.4	2136.0	3.64	0.45	12
6/15-6/21	6.25	3.04	520.0	2197.3	-0.93	-0.12	15
6/22-6/28	6.22	3.07	483.1	2232.9	-1.59	-0.20	15
6/29-7/5	6.22	3.12	459.8	2261.0	-1.60	-0.20	18
7/6-7/12	6.23	3.14	446.4	2249.7	-1.59	-0.19	17
7/13-7/19	6.46	3.10	448.8	2378.8	-0.56	-0.07	17
7/20-7/26	6.67	3.06	455.3	3659.0	0.00	0.00	19
7/27-8/2	6.68	3.09	451.4	4200.2	0.03	0.00	20
8/3-8/9	6.68	3.10	449.2	4168.6	0.08	0.01	21
8/10-8/16	6.68	3.12	448.2	4154.1	0.11	0.01	21
8/17-8/23	6.68	3.13	448.4	3620.4	0.25	0.02	21
8/24-8/30	6.80	3.17	468.9	4142.7	0.55	0.05	25
8/31-9/6	6.80	3.15	490.3	4575.9	0.18	0.02	25
9/7-9/13	6.77	3.15	505.3	4572.5	0.10	0.01	25
9/14-9/20	6.76	3.16	494.8	4567.3	0.10	0.01	23
9/21-9/27	6.75	3.18	474.9	4610.0	0.04	0.00	26
9/28-10/4	6.74	3.19	462.0	4529.2	0.34	0.03	25
10/5-10/11	6.74	NM	454.6	4430.2	0.23	0.02	24
10/12-10/18	6.74	NM	450.7	4339.0	0.17	0.02	22
10/19-10/25	6.73	NM	450.0	4319.0	0.10	0.01	21
10/26-11/1	6.73	NM	452.0	4279.0	0.10	0.01	22
11/2-11/8	6.74	NM	454.0	4237.0	0.10	0.01	25**
AVERAGE	6.55	3.07	479.6	3380.5	5.02	0.61	20

Notes:
* On 5/8 the Sonde was installed at the Dacotah. Water Quality Parameters are representative from 5/8 to 11/4.
On 7/16 a new Sonde was installed.
On 10/1 the pH probe malfunctioned.
**On 11/4 the Sonde was removed from the Dacotah.

ORP	Oxidation Reduction Potential	mV	millivolts
SpCond	Specific Conductivity	µS/cm	microSiemens per centimeter
DOsat	Dissolved Oxygen saturated	mg/L	milligrams per liter
DO	Dissolved Oxygen	gpm	gallons per minute
°C	degrees Celcius	%	percent
<	less than	NM	not measured

TABLE 7-1
LOWER REBELLION ADIT ANALYTICAL RESULTS FOR 2014

Sample ID		SCLR-AD-L-012	SCLR-AD-L-013	SCLR-AD-L-014	SCLR-AD-L-014	SCLR-AD-L-015	SCLR-AD-L-016	SCLR-AD-L-016	SCLR-AD-L-016D	SCLR-AD-L-016D	SCLR-AD-L-017	SCLR-AD-L-018	SCLR-AD-L-018	SCLR-AD-L-019	SCLR-AD-L-020	SCLR-AD-L-020	SCLR-AD-L-021	SCLR-AD-L-022	SCLR-AD-L-022	SCLR-AD-L-023	SCLR-AD-L-024	SCLR-AD-L-024	SCLR-AD-L-025	SCLR-AD-L-026	SCLR-AD-L-026	SCLR-AD-L-027	SCLR-AD-L-028	SCLR-AD-L-028	SCLR-AD-L-029	SCLR-AD-L-30	SCLR-AD-L-30	SCLR-AD-L-31	SCLR-AD-L-32	SCLR-AD-L-32	SCLR-AD-L-33	SCLR-AD-L-34	SCLR-AD-L-34
Date		1/30/2014	2/20/2014	3/31/2014	3/31/2014	4/16/2014	5/1/2014	5/1/2014	5/1/2014	5/1/2014	5/14/2014	5/21/2014	5/21/2014	5/30/2014	6/5/2014	6/5/2014	6/12/2014	6/18/2014	6/18/2014	6/27/2014	7/10/2014	7/10/2014	7/23/2014	8/5/2014	8/5/2014	8/21/2014	9/3/2014	9/3/2014	9/18/2014	9/30/2014	9/30/2014	10/14/2014	10/30/2014	10/30/2014	12/3/2014	12/22/2014	12/22/2014
Analysis		Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Dissolved Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Total Metals	Total Metals	Total Metals	Total Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Dissolved Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals
Aluminum	(µg/L)	687	1290	441	508	668	482	514	461	498	501	583	624	NM	390	394	473	494	497	486	660	657	645	709	737	712	566	598	653	737	731	650	653	666	739	675	770
Antimony	(µg/L)	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	NM	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<5.00 U	<2.50 U	<0.500 U	<2.50 U
Arsenic	(µg/L)	2.61 JD	3.99 JD	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	NM	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	0.574 J	<2.50 U	<2.50 U	0.635 J	<2.50 U	<2.50 U	0.519 J	<2.50 U	<2.50 U	0.596 J	<2.50 U	<2.50 U	0.618 J	<5.00 U	<2.50 U	0.711 J	<2.50 U
Barium	(µg/L)	<25.0 U	<25.0 U	11.5	<25.0 U	<25.0 U	11.2	<25.0 U	11.4	<25.0 U	<25.0 U	9.78 J	<25.0 U	NM	<25.0 U	<25.0 U	<25.0 U	10.6	<25.0 U	<25.0 U	15.1	<25.0 U	<25.0 U	14.4	<25.0 U	<25.0 U	14.0	<25.0 U	<25.0 U	13.1	<25.0 U	<25.0 U	12.5	<50.0 U	<25.0 U	10.7	<25.0 U
Beryllium	(µg/L)	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	NM	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U
Cadmium	(µg/L)	37.6 D	36.8 D	37.0	36.9 D	34.2 D	34.9	34.3 D	34.3	35.5 D	31.1 D	31.6	30.4 D	NM	20.3 D	19.5 D	24.5 D	28	24.6 D	25.0 D	37.4	34.7 D	34.2 D	40.1	38.0 D	36.4 D	34.7	29.4 D	36.2 D	41.5	39.5 D	32.8 D	37.2	72.3 D	37.0 D	38.2	36.7 D
Calcium	(µg/L)	52700	54400	58200	58700	58300	59300	58500	58100	59100	50200	39900	39900	NM	23800	22400	25300	25000	25200	24700	32100	31200	31100	34600	34100	34500	26500	26900	32600	37300	37600	29700	34300	35000	41600	45100	49000
Chloride	(µg/L)	8600 JD	8600 JD	NM	8800 JD	<5000 U	NM	8800 JD	NM	8700 JD	<5000 U	NM	900 J	800 J	NM	800 J	600 J	NM	800 J	NM	800 J	800 J	600 J	NM	600 J	600 J	NM	600 J	500 J	NM	1100 J	1100 J	NM	<500 U	<500 U	NM	<500 U
Chromium	(µg/L)	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	1.50 J	<5.00 U	1.14 J	<5.00 U	<5.00 U	<1.00 U	<5.00 U	NM	<5.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 UJ	<5.00 U	<5.00 U	<1.00 U	<10.0 U	<5.00 U	<1.00 U	<5.00 U
Cobalt	(µg/L)	18.4 D	19.1 D	19.4	21.1 D	20.3 D	19.7	20.0 D	19.4	20.1 D	18.1 D	14.7	14.7 D	NM	6.95 D	6.75 D	8.01 D	8.81	8.17 D	7.56 D	10.6	11.4 D	10.7 D	12.3	12.1 D	11.5 D	9.33	8.50 D	11.6 D	14.0 J	13.1 D	10.3 D	11.0	23.1 D	14.7 D	16.2	16.0 D
Copper	(µg/L)	66.1 D	78.3 D	49.2	56.5 D	54.0 D	46.5	46.4 D	45.5	47.6 D	46.1 D	54.2	54.6 D	NM	48.4 D	46.3 D	65.6 D	85.2	71.3 D	63.4 D	87.1	90.0 D	91.9 D	103	101 D	92.6 D	84.9	73.9 D	91.7 D	101 J	91.7 D	90.6 D	83.3	171 D	100 D	86.3	92.5 D
Hardness	(µg/L)	NM	NM	236000	NM	NM	241000	NM	236000	NM	NM	167000	NM	NM	95000	NM	NM	101000	NM	NM	130000	NM	NM	140000	NM	NM	107000	NM	NM	153000	NM	NM	140000	NM	NM	185000	NM
Iron	(µg/L)	1320	7090	112 J	529	1500	<100 U	408	<100 U	203 J	310	132 J	702	NM	536	625	935	496	1090	1110	448	1280	1230	341	1800	1300	431	1200	1340	235 J	1230	953	193 J	1070	840	353	684
Lead	(µg/L)	81.1 D	229 D	27.9	38.7 D	75.8 D	28.3	36.4 D	27.8	34.0 D	50 D	76.1	82.1 D	NM	78.4 D	94.6 D	99.4 D	124	96.1 D	95.6 D	164	136 D	144 D	140	149 D	143 D	151 J	137 D	161 D	127	144 D	147 D	139	301 D	121 D	91.0	104 D
Magnesium	(µg/L)	20000	20300	22100	21900	22400	22600	22300	22100	22500	19600	16300	16000	NM	8730	8490	9320	9320	9240	9040	12000	11700	11600	13000	12900	13100	9870	10100	12400	14600	14200	11300	13200	13300	15800	17300	18400
Manganese	(µg/L)	16300	16600	17600	17900	17400	18000	18100	17700	18400	15100	12500	12500	NM	7050	6910	7770	7860	8030	7370	10700	10700	10600	11500	11600	11200	8540	8510	11800	12900	12900	9250	11200	11400	13100	14200	15000
Nickel	(µg/L)	34.5 D	36.3 D	36.9	40.5 D	38.1 D	34.7	35.3 D	34.5	36.3 D	34.1 D	27.0	27.6 D	NM	20.0 D	19.5 D	22.0 D	22.7	20.1 D	18.8 D	23.7	25.0 D	24.0 D	27.0	26.7 D	24.7 D	22.1	20.3 D	25.8 D	29.0 J	27.3 D	23 D	22.8	49.6 D	32.0 D	32.2	31.4 D
Potassium	(µg/L)	1200	1260	1290	1270	1260	1260	1300	1260	1300	1140	1060	1050	NM	863 J	897 J	920 J	886 J	879 J	887 J	937 J	946 J	2050 JD	945 J	914 J	999 J	870 J	972 J	948 J	1010	962 J	909 J	988 J	1040	1050	1110	1200
Selenium	(µg/L)	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	NM	<5.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<10.0 U	<5.00 U	<1.00 U	<5.00 U
Silver	(µg/L)	<2.50 U	4.10 JD	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	NM	<2.50 U	<2.50 U	<2.50 U	1.6	<2.50 U	<2.50 U	1.67	<2.50 U	<2.50 U	1.14	<2.50 U	<2.50 U	1.02	<2.50 U	<2.50 U	1.44	<2.50 U	<2.50 U	1.58	<5.00 U	<2.50 U	<0.500 U	<2.50 U
Sodium	(µg/L)	1840	1890	2030	2030	2070	2040	2060	2020	2070	1820	1630	1560	NM	1080	1080	1120	1090	1090	1090	1220	1200	1190	1290	1290	1370	1180	1250	1350	1510	1370	1280	1420	1430	1560	1670	1770
Sulfate as SO4	(µg/L)	248000 JD	249000 D	NM	255000 D	255000 D	NM	260000 D	NM	260000 D	236000 D	NM	210000	111000	NM	120000	120000	NM	135000	132000	NM	169000	165000	NM	184000	183000	NM	140000	174000	NM	191000	148000	NM	172000	203000	NM	221000
Thallium	(µg/L)	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	NM	<2.50 U	4.19 JD	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<5.00 U	<2.50 U	<0.500 U	<2.50 U
Vanadium	(µg/L)	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	NM	<10.0 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 UJ	<10.0 U	<10.0 U	<2.00 U	<20.0 U	<10.0 U	<2.00 U	<10.0 U
Zinc	(µg/L)	8460	8420	8980	9080	8310	8580	8520	8580	8760	7410 D	7090	6820	NM	4610	4400	5060	5570	5410	4860	7020	6590	6730	7600	7400	7210	6270	5930	6990	7810	7390	6130	7060	7090	7570	7960	8260

Notes:

SCLR	Snow Creek Big Seven	D	The reported value is from a dilution
AD	Adit Discharge	U	Element was analyzed for but not detected above the Method Detection Limit
L	Laboratory	J	Estimated because quality control criteria were not met
D	D in the sample name is a duplicate	B	Value was less than the Contract Required Detection Limit but greater than the Instrument Detection Limit
µg/L	micrograms per liter	NM	Not Measured
<	less than the detection limit		

Some Samples were originally recorded with a different sample identification label. Below are the Sample IDs that were renamed to follow the sequence:

Re-Sequenced Sample ID	Recorded Sample ID	Sample Date
SCLR-AD-L-019	CCLR-AD-L-019	5/30/2014
SCLR-AD-L-020	CCLR-AD-L-020	6/5/2014

TABLE 7-2
LOWER REBELLION ADIT WATER QUALITY PARAMETERS

Field Parameters Taken at Time of Grab Sample						
Sample Date	Time	Temp °C	pH	ORP mV	SpCond µs/cm	DO mg/L
6/5/2014	1150	3.15	5.37	202	269	16.4
6/12/2014	1215	3.97	6.84	253	282	6.95
6/18/2014	1255	2.85	4.69	341	198	7.24
6/27/2014	1310	2.83	5.03	286.6	296	6.98
7/10/2014	1407	3.01	4.71	320.2	377	7.4
7/23/2014	1300	3.25	4.35	414	376	6.81
8/5/2014	1355	3.06	4.36	396	416	6.33
8/21/2014	1430	3.13	4.65	280.4	409	6.14
9/3/2014	1230	2.92	4.81	320	323	5.93
9/18/2014	1130	3.07	4.80	303	392	7.31
9/30/2014	1510	3.10	4.83	301.0	429	6.86
10/14/2014	1235	3.04	4.77	257	356	7.27
10/30/2014	1500	3.02	6.12	192.7	386	7.64
12/23/2014	1045	2.90	5.77	91.1	470	7.09
AVERAGE		3.09	5.08	282.7	356	6.92*

LOWER REBELLION AT ROAD CROSSING ADIT WATER PARAMETERS

Field Parameters Taken at Time of Grab Sample						
Sample Date	Time	Temp °C	pH	ORP mV	SpCond µs/cm	DO mg/L
6/27/2014	1315	4.28	4.83	359.7	288	8.8

Notes:
*DO Average does not include June 5, 2014 DO measurements due to inconsistency in all DO measurements at each adit on that date.

Temp	temperature	°C	degrees Celcius
SpCond	Specific Conductivity	µS/cm	micro-Siemens per cen
ORP	Oxidation/Reduction Potential	mV	millivolts
DO	Dissolved Oxygen	mg/L	milligrams per liter

TABLE 8-1
YELLOW JACKET ADIT ANALYTICAL RESULTS FOR 2014

Sample ID Date Analysis		NSMO-AD-L-001 4/16/2014 Total Metals	NSMO-AD-L-002 4/28/2014 Dissolved Metals	NSMO-AD-L-002 4/28/2014 Total Metals	NSMO-AD-L-003 5/14/2014 Total Metals	NSMO-AD-L-004 5/21/2014 Dissolved Metals	NSMO-AD-L-004 5/21/2014 Total Metals	NSMO-AD-L-005 5/30/2014 Total Metals	NSMO-AD-L-006 6/5/2014 Dissolved Metals	NSMO-AD-L-006 6/5/2014 Total Metals	NSMO-AD-L-007 6/12/2014 Total Metals	NSMO-AD-L-008 6/18/2014 Dissolved Metals	NSMO-AD-L-008 6/18/2014 Total Metals	NSMO-AD-L-009 6/27/2014 Total Metals	NSMO-AD-L-010 7/10/2014 Dissolved Metals	NSMO-AD-L-010 7/10/2014 Total Metals	NSMO-AD-L-011 7/23/2014 Total Metals	NSMO-AD-L-012 8/5/2014 Dissolved Metals	NSMO-AD-L-012 8/5/2014 Total Metals	NSMO-AD-L-013 8/21/2014 Total Metals	NSMO-AD-L-014 9/3/2014 Dissolved Metals	NSMO-AD-L-014 9/3/2014 Total Metals	NSMO-AD-L-015 9/18/2014 Total Metals	NSMO-AD-L-16 10/1/2014 Dissolved Metals	NSMO-AD-L-16 10/1/2014 Total Metals	NSMO-AD-L-17 10/14/2014 Total Metals	NSMO-AD-L-18 10/30/2014 Dissolved Metals	NSMO-AD-L-18 10/30/2014 Total Metals	NSMO-AD-L-19 11/25/2014 Total Metals	NSMO-AD-L-20 12/22/2014 Dissolved Metals	NSMO-AD-L-20 12/22/2014 Total Metals
Aluminum	(µg/L)	46.4 J	34.9 J	402	257	<20.0 U	150	63.8	<20.0 U	26.5 J	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	75.4	<20.0 U	<20.0 U	<20.0 U	<20.0 U	24.2 J	71.3	<20.0 U	23.4 J	<20.0 U	<20.0 U	<20.0 U	26.8 J	<20.0 U	<20.0 U
Antimony	(µg/L)	<2.50 U	<0.500 U	<2.50 U	<2.50 U	0.684 J	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<5.00 U	<2.50 U	<0.500 U	<2.50 U
Arsenic	(µg/L)	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	0.502 J	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<5.00 U	<2.50 U	0.573 J	<2.50 U
Barium	(µg/L)	38.1 JD	11.1	25.6 JD	<25.0 U	20.4 J	<25.0 U	<25.0 U	<25.0 U	<25.0 U	<25.0 U	11.7	<25.0 U	<25.0 U	14.6	<25.0 U	58.8 D	11.6	<25.0 U	<25.0 U	14.6	<25.0 U	58.9 D	11.8	<25.0 U	<25.0 U	11.6	<50.0 U	<25.0 U	8.31 J	<25.0 U
Beryllium	(µg/L)	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U
Cadmium	(µg/L)	9.05 D	0.946	6.78 D	3.29 D	3.46	3.55 D	4.08 D	4.14 D	4.35 D	5.29 D	4.96	4.67 D	5.15 D	4.76	5.01 D	17.2 D	3.73	4.58 D	4.55 D	2.35	4.22 D	17.5 D	3.10	4.49 D	3.51 D	2.41	9.04 D	4.00 D	2.54	3.75 D
Calcium	(µg/L)	50600	45500	45200	34400	37000	36500	39700	44000	42200	46700	46500	47300	47500	46900	47100	46200	47000	47600	47600	44400	44600	46500	46600	45400	48300	48000	49000	48600	48300	52800
Chloride	(µg/L)	8800 JD	NM	1100 J	1000 J	NM	1000 J	1000 J	NM	1000 J	800 J	NM	900 J	900 J	NM	900 J	800 J	NM	700 J	800 J	NM	800 J	700 J	NM	1200 J	1200 J	NM	<500 U	<500 U	NM	<500 UJ
Chromium	(µg/L)	<5.00 U	6.53	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	2.39	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	1.31 J	<5.00 U	<5.00 U	<1.00 U	<10.0 U	<5.00 U	<1.00 U	<5.00 U
Cobalt	(µg/L)	2.67 D	0.989	1.38 D	0.560 JD	0.810	0.735 JD	0.948 JD	1.19 D	1.14 D	1.66 D	1.67	1.57 D	1.94 D	1.70	1.87 D	4.10 D	1.61	1.57 D	1.43 D	1.48	1.31 D	3.4 D	1.70	1.59 D	1.27 D	1.60	2.87 D	1.44 D	1.33	1.40 D
Copper	(µg/L)	<2.50 U	0.660 J	<2.50 U	<2.50 U	0.821 J	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	0.681 J	<2.50 U	<2.50 U	<0.500 U	<2.50 U	2.82 JD	0.516 J	<2.50 U	<2.50 U	0.882 J	<2.50 U	2.85 JD	1.03	3.97 JD	<2.50 U	0.703 J	<5.00 U	<2.50 U	1.08	<2.50 U
Hardness	(µg/L)	NM	217000	NM	NM	181000	NM	NM	205000	NM	NM	216000	NM	NM	218000	NM	NM	217000	NM	NM	213000	NM	NM	219000	NM	NM	224000	NM	NM	224000	NM
Iron	(µg/L)	449	<100 U	547	260	<100 U	161 J	158 J	<100 U	152 J	204 J	<100 U	143 J	199 J	<100 U	138 J	896	<100 U	140 J	144 J	<100 U	128 J	699	<100 U	123 J	146 J	<100 U	135 J	225 J	<100 U	210 J
Lead	(µg/L)	6.99 D	0.749	6.81 D	10.8 D	1.49	12.4 D	7.70 D	0.662 JD	6.87 D	4.81 D	0.41	3.84 D	4.31 D	0.227	3.84 D	13.3 D	<0.100 U	2.85 D	3.07 D	0.793 J	5.59 D	10.4 D	0.248	3.33 D	2.65 D	<0.100 U	6.54 D	5.09 D	0.437	2.65 D
Magnesium	(µg/L)	26400	25200	25000	19700	21500	21200	21600	23200	22600	24200	24200	24200	24800	24600	24600	23700	24200	24300	24900	24700	25100	24700	24900	23500	25100	25200	25400	25300	25200	27400
Manganese	(µg/L)	3500	1160	1790	577	791	804	1190	1350	1340	1750	1930	1930	2090	2220	2250	5600	1920	1840	1860	1590	1580	5650	1900	1830	1720	2000	1840	1570	1600	1630
Nickel	(µg/L)	29.5 D	10.5	16.3 D	6.27 D	8.64	8.13 D	10.6 D	12.5 D	12.8 D	17.5 D	17	17.3 D	20.0 D	17.0	19.3 D	37.5 D	17.7	18.9 D	18.0 D	14.3	14.2 D	33.6 D	18.4	17.8 D	14.7 D	16.3	32.5 D	17.3 D	17.9	17.6 D
Potassium	(µg/L)	1570	1510	1700	1360	1440	1420	1390	1410	1370	1500	1480	1490	1560	1520	1550	2280	1520	1500	1610	1470	1590	1560	1550	1440	1530	1580	1620	1570	1560	1720
Selenium	(µg/L)	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<10.0 U	<5.00 U	<1.00 U	<5.00 U
Silver	(µg/L)	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<5.00 U	<2.50 U	<0.500 U	<2.50 U
Sodium	(µg/L)	3380	3100	3100	2000	2200	2110	2120	2260	2200	2620	2540	2560	2700	2770	2770	2720	2770	2810	3030	2710	2830	2800	3000	2670	2940	3030	3050	3020	3060	3320
Sulfate as SO4	(µg/L)	118000 D	NM	108000	8400	NM	88600	91500	NM	100000	111000	NM	116000	123000	NM	123000	115000	NM	115000	118000	NM	117000	114000	NM	111000	112000	NM	113000	112000	NM	116000 J
Thallium	(µg/L)	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	7.29 D	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<5.00 U	<2.50 U	<0.500 U	<2.50 U
Vanadium	(µg/L)	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<20.0 U	<10.0 U	<2.00 U	<10.0 U
Zinc	(µg/L)	5770	1810	3340	1660	1810	1780	2100	2410	2340	2800	3130	2890	2940	3210	2990	7330	3080	2910	2950	2520	2520	7620	3010	2840	2700	2840	2840	2720	2740	3040

Notes:

NSES	Neihart Slope Moulton	D	The reported value is from a dilution
AD	Adit Discharge	U	Element was analyzed for but not detected above the Method Detection Limit
L	Laboratory	J	Estimated because quality control criteria were not met
D	D in the sample name is a duplicate	B	Value was less than the Contract Required Detection Limit but greater than the Instrument Detection Limit
µg/L	micrograms per liter	NM	Not Measured
<	less than the detection limit		

TABLE 8-2
YELLOW JACKET ADIT WATER QUALITY PARAMETERS

Field Parameters Taken at Time of Grab Sample						
Sample Date	Time	Temp ºC	pH	ORP mV	SpCond µs/cm	DO mg/L
6/5/2014	1045	7.79	5.85	151.0	411	13.90
6/12/2014	1405	13.23	6.45	256.0	378	11.63
6/18/2014	1105	5.93	7.23	163.1	437	8.11
6/27/2014	1100	6.45	7.48	193.8	369	8.18
7/10/2014	1110	6.06	7.43	267.7	453	6.72
7/23/2014	1125	7.24	7.69	121.9	437	6.73
8/5/2014	1230	7.45	7.73	39.0	460	7.50
8/21/2014	1250	7.27	7.81	39.6	454	6.45
9/3/2014	1110	7.01	7.83	122.4	437	6.08
9/18/2014	1000	6.60	7.91	62.7	455	7.82
10/1/2014	925	5.70	7.32	40.0	452	7.86
10/14/2014	1440	7.30	7.80	188.0	447	8.12
10/30/2014	1345	6.21	7.86	59.2	449	8.91
11/25/2014	1110	5.99	7.92	110.9	456	7.25
12/22/2014	1430	3.43	8.09	79.6	458	7.89
AVERAGE		6.91	7.49	126.3	437	7.51*

Notes:
*DO Average does not include June 5 or June 12, 2014 DO measurements due to inconsistency in all DO measurements at each adit on those dates.

Temp	temperature	ºC	degrees Celcius
SpCond	Specific Conductivity	µS/cm	micro-Siemens per centimeter
ORP	Oxidation/Reduction Potential	mV	millivolts
DO	Dissolved Oxygen	mg/L	milligrams per liter

TABLE 9-1
BIG SEVEN ADIT ANALYTICAL RESULTS FOR 2014

Sample ID		SCBS-AD-L-012A	SCBS-AD-L-012B	SCBS-AD-L-012B	SCBS-AD-L-013	SCBS-AD-L-014	SCBS-AD-L-014	SCBS-AD-L-015	SCBS-AD-L-016	SCBS-AD-L-016	SCBS-AD-L-017	SCBS-AD-L-018	SCBS-AD-L-018	SCBS-AD-L-019	SCBS-AD-L-020	SCBS-AD-L-020	SCBS-AD-L-021	SCBS-AD-L-022	SCBS-AD-L-022	SCBS-AD-L-023	SCBS-AD-L-024	SCBS-AD-L-024	SCBS-AD-L-025	SCBS-AD-L-026	SCBS-AD-L-026	SCBS-AD-L-027	SCBS-AD-L-028	SCBS-AD-L-028	SCBS-AD-L-29	SCBS-AD-L-30	SCBS-AD-L-30	SCBS-AD-L-31	SCBS-AD-L-32	SCBS-AD-L-32
Date		2/20/2014	3/31/2014	3/31/2014	4/16/2014	5/1/2014	5/1/2014	5/14/2014	5/21/2014	5/21/2014	5/30/2014	6/5/2014	6/5/2014	6/12/2014	6/18/2014	6/18/2014	6/27/2014	7/10/2014	7/10/2014	7/23/2014	8/5/2014	8/5/2014	8/21/2014	9/3/2014	9/3/2014	9/18/2014	9/30/2014	9/30/2014	10/14/2014	10/30/2014	10/30/2014	12/3/2014	12/23/2014
Analysis		Total Metals	Dissolved Metals	Dissolved Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals
Aluminum	(µg/L)	1040 D	889 D	890 D	961 D	865 D	856 D	784 D	790 D	793 D	991 D	1120	1140	1300	1340	1370	1590 D	2410	2510 D	2330 D	2320 D	2430 D	2530 D	2380 D	2510 D	3660 D	3430 D	3820 D	3830 D	3320 D	3710 D	3000 D	2520 D	2940 D
Antimony	(µg/L)	<5.00 U	<2.50 U	<2.50 U	<2.50 U	<5.00 U	<5.00 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<2.50 U	<2.50 U	<5.00 U	<2.50 U	<2.50 U	<5.00 U	<2.50 U	<5.00 U	<5.00 U
Arsenic	(µg/L)	8.13 JD	6.86 JD	7.36 JD	6.85 JD	6.83 JD	5.95 JD	7.05 JD	5.70 JD	4.43 JD	<2.50 U	<2.50 U	<2.50 U	<2.50 U	1.65 J	1.23 JD	<2.50 U	3.70 JD	4.17 JD	<5.00 U	5.39 JD	5.60 JD	8.27 JD	<5.00 U	<5.00 U	4.07 JD	6.00 JD	<5.00 U	7.61 JD	6.76 JD	15.5 JD	7.34 JD	8.88 JD	5.79 JD
Barium	(µg/L)	<50.0 U	<25.0 U	<25.0 U	<25.0 U	<50.0 U	<50.0 U	<25.0 U	<25.0 U	<25.0 U	<25.0 U	<25.0 U	<25.0 U	<25.0 U	9.67 J	<25.0 U	<25.0 U	<25.0 U	<25.0 U	<50.0 U	<50.0 U	<50.0 U	<50.0 U	<50.0 U	<50.0 U	<25.0 U	<25.0 U	<50.0 U	<25.0 U	<25.0 U	<50.0 U	<25.0 U	<50.0 U	<50.0 U
Beryllium	(µg/L)	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<20.0 U	<20.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<2.00 U	<2.00 U	2.83 J	3.34 J	2.86 J	<10.0 U	6.21	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<20.0 U	<20.0 U	<20.0 U	14.8 JD	11.9 JD	12.8 JD	14.7 JD	13.6 JD	14.3 JD	13.6 JD	<20.0 U	<20.0 U
Cadmium	(µg/L)	21.4 D	<0.500 U	19.0 D	18.1 D	15.5 D	15.8 D	13.9 D	15.7 D	14.5 D	11.6 D	11.8 D	11.1 D	15.6 D	17.2	15.3 D	21.1 D	48.4 D	50.3 D	58.4 D	62.5 D	65.1 D	67.5 D	68.1 D	62.9 D	123 D	133 D	133 D	126 D	125 D	266 D	107 D	94.9 D	95.0 D
Calcium	(µg/L)	172000 D	165000 D	169000 D	162000 D	167000 D	160000 D	162000 D	147000 D	148000 D	111000 D	90600	88400	60400	75700	74700	101000 D	139000	137000 D	142000 D	149000 D	148000 D	156000 D	145000 D	147000 D	156000 D	162000 D	168000 D	181000 D	172000 D	185000 D	167000 D	169000 D	185000 D
Chloride	(µg/L)	8700 JD	NM	9000 JD	<50000 U	NM	8800 JD	6700 JD	NM	7300 JD	<5000 U	NM	<5000 U	<5000 U	NM	<5000 U	<5000 U	NM	6500 JD	<5000 U	NM	<5000 U	<5000 U	NM	<5000 U	<5000 U	NM	10300 JD	10400 JD	NM	<5000 U	<5000 U	NM	<5000 UJ
Chromium	(µg/L)	<10.0 U	<5.00 U	<5.00 U	<5.00 U	<10.0 U	<10.0 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<5.00 U	<5.00 UJ	<10.0 U	<5.00 U	<5.00 U	<10.0 U	<5.00 U	<10.0 U	<10.0 U
Cobalt	(µg/L)	324 D	<0.500 U	343 D	329 D	292 D	294 D	298 D	274 D	271 D	212 D	157 D	150 D	97.7 D	124	116 D	177 D	241 D	264 D	301 D	300 D	293 D	310 D	297 D	275 D	332 D	360 JD	371 D	350 D	325 D	657 D	358 D	347 D	358 D
Copper	(µg/L)	<5.00 U	<2.50 U	5.15 D	4.06 JD	<5.00 U	<5.00 U	3.17 JD	3.58 JD	2.93 JD	6.35 D	8.34 D	8.68 D	22.0 D	19.7	17.5 D	15.0 D	9.56 D	12.5 D	8.74 JD	6.49 JD	7.11 JD	6.59 JD	6.86 JD	6.82 JD	26.1 D	29.2 JD	27.4 D	27.8 D	25.1 D	48.1 D	27.6 D	19.6 D	20.4 D
Hardness	(µg/L)	NM	783000 D	NM	NM	797000 D	NM	NM	710000 D	NM	NM	418000	NM	NM	352000	NM	NM	651000	NM	NM	705000 D	NM	NM	688000 D	NM	NM	771000 D	NM	NM	815000 D	NM	NM	796000 D	NM
Iron	(µg/L)	149000 D	142000 D	145000 D	137000 D	140000 D	134000 D	139000 D	123000 D	124000 D	79300 D	43600	45100	25300	30000	32000	54800 D	100000	104000 D	122000 D	131000 D	133000 D	150000 D	125000 D	133000 D	148000 D	161000 D	167000 D	179000 D	171000 D	180000 D	162000 D	156000 D	173000 D
Lead	(µg/L)	6.76 D	<0.500 U	2.44 D	2.28 D	<1.00 U	3.63 D	1.47 D	<0.500 U	1.24 D	4.80 D	1.90 D	4.07 D	2.07 D	1.46	2.35 D	2.87 D	1.17 D	4.28 D	4.59 D	1.38 JD	5.00 D	7.34 D	3.37 JD	4.79 D	18.4 D	11.5 D	26.0 D	29.7 D	17.3 D	57.5 D	28.4 D	15.7 D	28.2 D
Magnesium	(µg/L)	92500 D	90300 D	91500 D	90500 D	92200 D	88100 D	90800 D	83500 D	82600 D	62700 D	46600	46300	30700	39500	39200	54400 D	73600	73900 D	76100 D	80800 D	80400 D	85800 D	78900 D	80600 D	85500 D	89100 D	92100 D	98800 D	93700 D	101000 D	90400 D	90800 D	100000 D
Manganese	(µg/L)	98600 D	93500 D	95300 D	89200 D	90000 D	91800 D	87200 D	81800 D	82400 D	61800 D	42000	40400 J	27600	34800	35000	56200 D	67100	83300 D	91700 D	95800 D	94700 D	104000 D	93400 D	93200 D	105000 D	109000 D	113000 D	114000 D	110000 D	115000 D	103000 D	105000 D	115000 D
Nickel	(µg/L)	610 D	<2.50 U	653 D	603 D	550 D	545 D	568 D	514 D	510 D	396 D	302 D	288 D	193 D	248	226 D	343 D	454 D	497 D	573 D	577 D	554 D	575 D	546 D	509 D	598 D	650 JD	671 D	653 D	580 D	1180 D	654 D	650 D	660 D
Potassium	(µg/L)	2610 JD	2820 JD	2970 JD	2570 JD	3010 JD	3140 JD	3000 JD	2670 JD	2580 JD	2230 JD	1810	1940	1550	1730	1720	1970 JD	2290	2260 JD	1440	2250 JD	2240 JD	2860 JD	<2500 U	2760 JD	2220 JD	2150 JD	2150 JD	2370 JD	2330 JD	2630 JD	2410 JD	<2500 U	3160 JD
Selenium	(µg/L)	<10.0 U	<5.00 U	<5.00 U	<5.00 U	<10.0 U	<10.0 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<5.00 U	<5.00 U	<10.0 U	<5.00 U	<5.00 U	12.0 JD	<5.00 U	<10.0 U	<10.0 U
Silver	(µg/L)	<5.00 U	<2.50 U	<2.50 U	<2.50 U	<5.00 U	<5.00 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<5.00 U	6.30 JD	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<2.50 U	<2.50 U	<5.00 U	<2.50 U	<2.50 U	<5.00 U	<2.50 U	<5.00 U	<5.00 U
Sodium	(µg/L)	3100 JD	3310 JD	3340 JD	3380 JD	3390 JD	3560 JD	3540 JD	3420 JD	3220 JD	2740 JD	2430	2470	2250	2430	2430	2610 JD	2900	2830 JD	2780 JD	2800 JD	2840 JD	3070 JD	2750 JD	3020 JD	2910 JD	2910 JD	2850 JD	3100 JD	3170 JD	3300 JD	2910 JD	3150 JD	3290 JD
Sulfate as SO4	(µg/L)	1260000 D	NM	1190000 D	1090000 D	NM	1140000 D	1190000 D	NM	1130000 D	856000 D	NM	614000 D	354000 D	NM	490000 D	733000 D	NM	1090000 D	1080000 D	NM	1210000 D	1300000 D	NM	1180000 D	1310000 D	NM	1340000 D	1390000 D	NM	1380000 D	1310000 D	NM	1230000 JD
Thallium	(µg/L)	<5.00 U	<2.50 U	<2.50 U	<2.50 U	<5.00 U	<5.00 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<2.50 U	<2.50 U	<5.00 U	<2.50 U	<2.50 U	<5.00 U	<2.50 U	<5.00 U	<5.00 U
Vanadium	(µg/L)	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<20.0 U	<20.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<20.0 U	<10.0 U	<10.0 U	<20.0 U	<10.0 U	<10.0 U	<20.0 U	<10.0 U	<20.0 U	<20.0 U
Zinc	(µg/L)	43900 D	41600 D	42700 D	37300 D	37300 D	37500 D	36800 D	34500 D	34700 D	25300 D	19800	19100	13900	18700	17700	26900 D	39900	40800 D	44900 D	48400 D	46400 D	49800 D	44700 D	44100 D	53900 D	56200 D	58800 D	57400 D	55500 D	57600 D	50300 D	48900 D	53200 D

BIG SEVEN AREA OPPORTUNISTIC SAMPLES ANALYTICAL RESULTS FOR 2014

Sample ID		SCBSU-AD-L-001	SCBSU-AD-L-002
Date		6/12/2014	6/27/2014
Analysis		Total Metals	Total Metals
Aluminum	(µg/L)	22.4 J	285
Antimony	(µg/L)	<2.50 U	<2.50 U
Arsenic	(µg/L)	<2.50 U	<2.50 U
Barium	(µg/L)	<25.0 U	<25.0 U
Beryllium	(µg/L)	<2.00 U	<2.00 U
Cadmium	(µg/L)	<0.500 U	<0.500 U
Calcium	(µg/L)	4820	5720
Chloride	(µg/L)	600 J	800 J
Chromium	(µg/L)	<5.00 U	<5.00 U
Cobalt	(µg/L)	<0.500 U	<0.500 U
Copper	(µg/L)	<2.50 U	<2.50 U
Hardness	(µg/L)	NM	NM
Iron	(µg/L)	<100 U	419
Lead	(µg/L)	<0.500 U	6.48 D
Magnesium	(µg/L)	1050	1330
Manganese	(µg/L)	2.44 J	44.4
Nickel	(µg/L)	<2.50 U	<2.50 U
Potassium	(µg/L)	380 J	525 J
Selenium	(µg/L)	<5.00 U	<5.00 U
Silver	(µg/L)	<2.50 U	<2.50 U
Sodium	(µg/L)	751 J	825 J
Sulfate as SO4	(µg/L)	4400	6000
Thallium	(µg/L)	<2.50 U	<2.50 U
Vanadium	(µg/L)	<10.0 U	<10.0 U
Zinc	(µg/L)	33.5	49.5

Notes:

SCBSU	Snow Creek Big Seven Upper	D	The reported value is from a dilution
AD	Adit Discharge	U	Element was analyzed for but not detected above the Method Detection Limit
L	Laboratory	J	Estimated because quality control criteria were not met
D	D in the sample name is a duplicate	B	Value was less than the Contract Required Detection Limit but greater than the Instrument Detection Limit
µg/L	micrograms per liter	NM	Not Measured
<	less than the detection limit		

One Sample was originnally recorded with a different sample identification label. Below is the Sample ID that were renamed to follow the sequence:

Re-Sequenced Sample ID	Recorded Sample ID	Sample Date
SCBSU-AD-L-002	SCBS-OP-L-001	6/27/2014
SCBS-AD-L-012A	SCBS-AD-L-012	2/20/2014
SCBS-AD-L-012B	SCBS-AD-L-012	3/31/2014
SCBS-AD-L-012B	SCBS-AD-L-012	3/31/2014
SCBS-AD-L-016	SCBS-AD-L-018	5/21/2014
SCBS-AD-L-016	SCBS-AD-L-018	5/21/2014
SCBS-AD-L-017	CCBS-AD-L-017	5/30/2014
SCBS-AD-L-018	CCBS-AD-L-018	6/5/2014

TABLE 9-2
BIG SEVEN ADIT WATER QUALITY PARAMETERS

Field Parameters Taken at Time of Grab Sample						
Sample Date	Time	Temp ºC	pH	ORP mV	SpCond µs/cm	DO mg/L
6/5/2014	1220	5.35	5.13	158.0	1090	19.60
6/12/2014	1230	7.00	5.81	218.0	740	14.60
6/18/2014	1310	4.80	5.39	192.0	941	5.93
6/27/2014	1340	4.95	5.33	187.7	1236	5.86
7/10/2014	1400	9.83	5.87	92.4	1624	5.11
7/23/2014	1245	6.27	6.20	78.4	1858	5.74
8/5/2014	1420	4.59	5.81	95.0	610	9.20
8/21/2014	1415	5.26	6.35	21.9	1974	5.21
9/3/2014	1300	3.93	5.77	115.0	905	5.79
9/18/2014	1150	4.45	5.77	105.0	435	6.80
9/30/2014	1545	4.10	5.82	100.0	1486	6.75
10/14/2014	1255	4.07	5.84	46.0	466	7.75
10/30/2014	1520	4.80	6.16	31.4	2006	5.62
12/23/2014	1020	3.60	6.27	28.7	1935	6.79
AVERAGE		5.21	5.82	105.0	1236	6.38*

BIG SEVEN - NEARBY STREAM - WATER PARAMETERS

Field Parameters Taken at Time of Grab Sample						
Sample Date	Time	Temp ºC	pH	ORP mV	SpCond µs/cm	DO mg/L
6/27/2014	1345	4.88	6.65	139.5	76	8.42

BIG SEVEN - SEEP ABOVE ROAD - WATER PARAMETERS

Field Parameters Taken at Time of Grab Sample						
Sample Date	Time	Temp ºC	pH	ORP mV	SpCond µs/cm	DO mg/L
6/27/2014	1350	2.7	6.68	164	60	8.95

Notes:
*DO Average does not include June 5 or June 12, 2014 DO measurements due to inconsistency in all DO measurements at each adit on those dates.

Temp	temperature	ºC	degrees Celcius
SpCond	Specific Conductivity	µS/cm	micro-Siemens per cer
ORP	Oxidation/Reduction Potential	mV	millivolts
DO	Dissolved Oxygen	mg/L	milligrams per liter

TABLE 10-1
BROADWATER ADIT ANALYTICAL RESULTS FOR 2014

Sample ID		NSBW-AD-L-028	NSBW-AD-L-029	NSBW-AD-L-030	NSBW-AD-L-030	NSBW-AD-L-031	NSBW-AD-L-032	NSBW-AD-L-032	NSBW-AD-L-033	NSBW-AD-L-034	NSBW-AD-L-034	NSBW-AD-L-035	NSBW-AD-L-036	NSBW-AD-L-036	NSBW-AD-L-037	NSBW-AD-L-038	NSBW-AD-L-038	NSBW-AD-L-039	NSBW-AD-L-039D*	NSBW-AD-L-040	NSBW-AD-L-040	NSBW-AD-L-041	NSBW-AD-L-042	NSBW-AD-L-042	NSBW-AD-L-043	NSBW-AD-L-044	NSBW-AD-L-044	NSBW-AD-L-045	NSBW-AD-L-046	NSBW-AD-L-046	NSBW-AD-L-047	NSBW-AD-L-048	NSBW-AD-L-048	NSBW-AD-L-049	NSBW-AD-L-050	NSBW-AD-L-050
Date		1/29/2014	2/20/2014	3/31/2014	3/31/2014	4/16/2014	4/28/2014	4/28/2014	5/14/2014	5/21/2014	5/21/2014	5/30/2014	6/5/2014	6/5/2014	6/12/2014	6/18/2014	6/18/2014	6/27/2014	6/27/2014	7/30/2014	7/10/2014	7/23/2014	8/5/2014	8/5/2014	8/21/2014	9/3/2014	9/3/2014	9/18/2014	10/1/2014	10/1/2014	10/14/2014	10/30/2014	10/30/2014	12/3/2014	12/22/2014	12/22/2014
Analysis		Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals
Aluminum	(µg/L)	27.6 J	20.0 J	38.6 J	42.5 J	96.2	<20.0 U	514	52.8	28.8 J	87.3	33.7 J	25.1 J	29.0 J	29.2 J	26.7 J	25.6 J	26.1 J	25.6 J	29.0 J	26.2 J	26.6 J	24.4 J	25.7 J	23.8 J	26.0 J	26.5 J	21.7 J	22.3 J	21.1 J	<20.0 U	<20.0 U	<20.0 U	26.5 J	40.1 J	<20.0 U
Antimony	(µg/L)	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<5.00 U	<2.50 U	<0.500 U	<2.50 U
Arsenic	(µg/L)	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	0.632 J	<2.50 U	<2.50 U	<2.50 U	0.804 J	<2.50 U	<2.50 U	0.626 J	<2.50 U	<2.50 U	0.928 J	<2.50 U	<2.50 U	0.608 J	<2.50 U	<2.50 U	0.879 J	<5.00 U	<2.50 U	0.837 J	<2.50 U
Barium	(µg/L)	<25.0 U	<25.0 U	<25.0 U	<25.0 U	<25.0 U	7.44 J	<25.0 U	<25.0 U	7.27 J	<25.0 U	<25.0 U	<25.0 U	<25.0 U	<25.0 U	<5.00 U	<25.0 U	<25.0 U	<25.0 U	<5.00 U	<25.0 U	<25.0 U	<5.00 U	<25.0 U	<25.0 U	6.01 J	<25.0 U	<25.0 U	<5.00 U	<25.0 U	<25.0 U	<5.00 U	<50.0 U	<25.0 U	5.32 J	<25.0 U
Beryllium	(µg/L)	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U
Cadmium	(µg/L)	12.7 D	11.0 D	8.59 D	8.92 D	7.38 D	79.9	77.3 D	74.5 D	98.7	91.0 D	76.5 D	68.2 D	67.4 D	53.1 D	46.6	44.5 D	36.8 D	36.8 D	37.2	36.6 D	25.0 D	24.0	23.3 D	22.5 D	67.5	54.9 D	34.5 D	11.8	25.3 D	21.4 D	25.2	50.0 D	14.9 D	14.6	13.3 D
Calcium	(µg/L)	96300	98300	97500	99900	87300	42300	40900	58100	54300	52200	61400	69300	67400	76400	76800	78600	81200	80700	78900	79900	81200	86100	82600	84100	65000	61800	76500	39000	83400	87600	84700	85500	92300	72200	101000
Chloride	(µg/L)	8700 JD	8700 JD	NM	8900 JD	8900 JD	NM	1100 J	7200 JD	NM	7200 JD	7200 JD	NM	7300 JD	5400 JD	NM	6600 JD	6500 JD	6600 JD	NM	6500 JD	<5000 U	NM	<5000 U	5200 JD	NM	<5000 U	<5000 U	NM	10300 JD	10400 JD	NM	<5000 U	<5000 U	NM	<5000 UJ
Chromium	(µg/L)	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	4.47	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<10.0 U	<5.00 U	1.84 J	<5.00 U
Cobalt	(µg/L)	0.584 JD	0.502 JD	<0.500 U	0.537 JD	0.521 JD	2.24	2.35 D	3.90 D	5.00	4.86 D	4.47 D	4.02 D	3.77 D	2.83 D	2.24	2.39 D	1.70 D	1.72 D	2.06	1.70 D	1.08 D	0.994	0.942 JD	0.809 JD	3.56	3.08 D	1.83 D	0.582	1.11 D	0.975 JD	1.14	2.29 D	0.901 JD	2.19	0.811 JD
Copper	(µg/L)	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	7.27	9.58 D	5.08 D	7.19	6.34 D	6.37 D	3.68 JD	4.09 JD	3.86 JD	3.33	3.36 JD	<2.50 U	<2.50 U	2.91	2.70 JD	<2.50 U	2.41	<2.50 U	<2.50 U	4.65	4.20 JD	4.49 JD	1.67	<2.50 U	<2.50 U	3.55	5.53 JD	4.65 JD	38.0	3.35 JD
Hardness	(µg/L)	NM	NM	494000	NM	NM	258000	NM	NM	295000	NM	NM	367000	NM	NM	410000	NM	NM	NM	421000	NM	NM	454000	NM	NM	354000	NM	NM	205000	NM	NM	444000	NM	NM	368000	NM
Iron	(µg/L)	<100 U	<100 U	<100 U	<100 U	<100 U	<100 U	240 J	<100 U	<100 U	<100 U	<100 U	<100 U	<100 U	<100 U	<100 U	<100 U	<100 U	<100 U	<100 U	<100 U	<100 U	<100 U	<100 U	<100 U	<100 U	<100 U	<100 U	<100 U	<100 U	<100 U	<100 U	<100 U	<100 U	203 J	<100 U
Lead	(µg/L)	0.578 JD	<0.500 U	<0.500 U	<0.500 U	0.673 JD	63.8	91.0 D	42.9 D	66.6	70.8 D	44.8 D	17.8 D	27.7 D	8.93 D	0.813	3.96 D	2.09 D	2.89 D	2.40	7.50 D	4.73 D	0.728	1.70 D	1.70 D	30.1 J	36.3 D	7.99 D	0.203	2.32 D	1.14 D	1.58	9.76 D	1.24 D	8.43	1.20 D
Magnesium	(µg/L)	61000	61600	60900	61200	54200	37100	35900	45300	38800	37900	43000	47100	45700	51600	53100	53200	54500	54500	54400	54300	54900	58000	56000	56800	46600	45000	52900	26200	55100	58500	56500	56600	60300	45600	65000
Manganese	(µg/L)	4200	3900	4240	4330	4110	4890	4990	8710	9390	9410	10100	9290	9220	7540	6290	6350	5410	5410	5140	5120	3510	3240	3230	3070	7540	7460	5820	1920	4210	3520	4300	4350	3820	3790	4110
Nickel	(µg/L)	86.4 D	84.2 D	80.8 D	81.8 D	74.5 D	57.9	56.6 D	104 D	113	111 D	123 D	126 D	120 D	116 D	113	114 D	100 D	99.2 D	93.2	90.1 D	81.9 D	86.9	80.0 D	79.1 D	98.2	88.5 D	94.9 D	44.6	87.0 D	94 D	78.8	154 D	85.9 D	65.6	86.2 D
Potassium	(µg/L)	2250	2270	2330	2270	2030	1630	1830	1850	1670	1690	1840	1900	1840	2050	2100	2080	2110	2090	2070	2080	1120	2100	2090	2250	1830	1920	2070	972 J	2050	2180	2230	2290	2200	2190	2330
Selenium	(µg/L)	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	1.52 J	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	1.38 J	<5.00 U	<5.00 U	<5.00 U	1.52 J	<5.00 U	<5.00 U	1.13 J	<5.00 U	<5.00 U	2.09	<5.00 U	<5.00 U	1.02 J	<5.00 U	<5.00 U	1.99 J	<10.0 U	<5.00 U	1.32 J	<5.00 U
Silver	(µg/L)	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<5.00 U	<2.50 U	<0.500 U	<2.50 U
Sodium	(µg/L)	3430	3580	3790	3840	3470	1640	1650	1820	1560	1560	1650	1780	1720	2260	2290	2280	2470	2500	2500	2500	2720	2890	2790	2920	1790	1810	2460	1230	2570	2900	3120	3110	3250	3690	3430
Sulfate as SO4	(µg/L)	412000 JD	402000 D	NM	380000 D	328000 D	NM	230000	333000 D	NM	309000 D	354000 D	NM	377000 D	366000 D	NM	395000 D	402000 D	403000 D	NM	385000 D	370000 D	376000 D	385000 D	NM	311000 D	367000 D	NM	342000 D	359000 D	NM	658000 D	351000 D	NM	425000 JD
Thallium	(µg/L)	2.65 JD	<2.50 U	<2.50 U	<2.50 U	11.7 D	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<5.00 U	16.6 D	<0.500 U	13.1 D
Vanadium	(µg/L)	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<20.0 U	<10.0 U	<2.00 U	<10.0 U
Zinc	(µg/L)	15000	13900	13800	14200	11900	21200	21400	26200	30100	29100	29400	30100	28700	27100	26500	25100	23000	23100	22300	21400	18000	18400	17400	17200	26200	24600	21000	8880	18800	17600	18000	17800	16200	12600	17000

Notes:

NSBW	Neihart Slope Broadwater	D	The reported value is from a dilution
AD	Adit Discharge	U	Element was analyzed for but not detected above the Method Detection Limit
L	Laboratory	J	Estimated because quality control criteria were not met
D	D in the sample name is a duplicate	B	Value was less than the Contract Required Detection Limit but greater than the Instrument Detection Limit
µg/L	micrograms per liter	NM	Not Measured
<	less than the detection limit		

TABLE 10-2
BROADWATER ADIT WATER QUALITY PARAMETERS

Field Parameters Taken at Time of Grab Sample						
Sample Date	Time	Temp ºC	pH	ORP mV	SpCond µs/cm	DO mg/L
6/5/2014	950	7.30	5.75	224.0	819	8.55
6/12/2014	1500	7.31	6.64	178.0	827	15.63
6/18/2014	1000	6.36	7.04	227.9	810	8.63
6/27/2014	925	6.60	6.85	139.1	864	7.45
7/10/2014	1010	6.61	6.95	148.2	772	7.75
7/23/2014	1020	6.73	6.91	168.4	916	6.24
8/5/2014	1015	6.81	7.01	185.0	895	
8/21/2014	1200	7.31	8.06	94.1	872	7.19
9/3/2014	930	6.77	7.08	39.6	735	5.93
9/18/2014	840	6.62	7.49	220.0	839	7.90
10/1/2014	1010	6.39	7.34	109.0	831	7.33
10/14/2014	1515	6.62	7.17	66.7	887	8.13
10/30/2014	1240	6.29	7.45	255.0	869	8.62
12/3/2014	1240	5.31	7.28	221.7	889	8.46
12/22/2014	1020	5.71	7.22	281.4	923	6.60
AVERAGE		6.58	7.08	170.5	850	7.60*

Notes:
*DO Average does not include June 12, 2014 DO measurements due to inconsistency in all DO measurements at each adit on that date.

Temp	temperature	ºC	degrees Celcius
SpCond	Specific Conductivity	µS/cm	micro-Siemens per centimeter
ORP	Oxidation/Reduction Potential	mV	millivolts
DO	Dissolved Oxygen	mg/L	milligrams per liter
NM	Not Measured		

TABLE 11-1
EVENING STAR ADIT ANALYTICAL RESULTS FOR 2014

Sample ID		NSES-AD-L-012	NSES-AD-L-013	NSES-AD-L-014	NSES-AD-L-014	NSES-AD-L-015	NSES-AD-L-016	NSES-AD-L-016	NSES-AD-L-017	NSES-AD-L-018	NSES-AD-L-018	NSES-AD-L-019	NSES-AD-L-020	NSES-AD-L-020	NSES-AD-L-021	NSES-AD-L-022	NSES-AD-L-022	NSES-AD-L-023	NSES-AD-L-024	NSES-AD-L-024	NSES-AD-L-025	NSES-AD-L-026	NSES-AD-L-026	NSES-AD-L-027	NSES-AD-L-028	NSES-AD-L-028	NSES-AD-L-029	NSES-AD-L-30	NSES-AD-L-30	NSES-AD-L-31	NSES-AD-L-32	NSES-AD-L-32	NSES-AD-L-33	NSES-AD-L-34	NSES-AD-L-34
Date		1/30/2014	2/20/2014	3/31/2014	3/31/2014	4/16/2014	4/28/2014	4/28/2014	5/14/2014	5/21/2014	5/21/2014	5/30/2014	6/5/2014	6/5/2014	6/12/2014	6/18/2014	6/18/2014	6/27/2014	7/10/2014	7/10/2014	7/23/2014	8/5/2014	8/5/2014	8/21/2014	9/3/2014	9/3/2014	9/18/2014	10/1/2014	10/1/2014	10/14/2014	10/30/2014	10/30/2014	11/25/2014	12/22/2014	12/22/2014
Analysis		Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals
Aluminum	(µg/L)	39.2 J	34.3 J	30.1 J	94.8	136	47.5 J	79.9	58.8	35.7 J	52.3	57.4	34.3 J	38.9 J	42.1 J	33.9 J	36.4 J	36.2 J	32.7 J	45.1 J	36.0 J	30.9 J	43.8 J	35.7 J	34.1 J	44.3 J	44.5 J	26.2 J	30.9 J	<20.0 U	20.0 J	20.7 J	35.8 J	32.3 J	30.8 J
Antimony	(µg/L)	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<5.00 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 J	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<5.00 U	<2.50 U	<0.500 U	<2.50 U
Arsenic	(µg/L)	3.41 JD	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<5.00 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	0.583 J	<2.50 U	<2.50 U	0.503 J	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	0.521 J	<5.00 U	<2.50 U	0.578 J	<2.50 U
Barium	(µg/L)	<25.0 U	<25.0 U	8.13 J	<25.0 U	<25.0 U	<50.0 U	<25.0 U	<25.0 U	7.63 J	<25.0 U	<25.0 U	<25.0 U	<25.0 U	<25.0 U	6.16 J	<25.0 U	<25.0 U	8.76 J	<25.0 U	<25.0 U	8.77 J	<25.0 U	<25.0 U	<25.0 U	<25.0 U	<25.0 U	10.9	<25.0 U	<25.0 U	11.5	<50.0 U	<25.0 U	11.1	<25.0 U
Beryllium	(µg/L)	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U
Cadmium	(µg/L)	1.11 D	<0.500 U	0.380	0.725 JD	1.15 D	4.49 D	4.58 D	1.78 D	1.87	1.48 D	1.74 D	1.08 D	1.64 D	1.53 D	0.817	1.35 D	1.09 D	0.780	1.26 D	1.05 D	0.388	0.884 JD	0.600 JD	<0.500 U	0.549 JD	0.7 JD	0.222	<0.500 U	<0.500 U	0.232	1.13 JD	<0.500 U	7.07	<0.500 U
Calcium	(µg/L)	84500	86100	84000	89300	87900	109000	114000	94200	92000	92000	93400	90500	87700	91000	87800	91000	88700	90600	87100	85400	88800	85000	85200	82500	82400	82000	82400	81900	84900	84200	84900	82000	83600	84900
Chloride	(µg/L)	1300 J	1300 J	NM	9400 JD	9200 JD	NM	9100 JD	7500 JD	NM	7500 JD	7500 JD	NM	1200 J	NM	NM	1100 J	6700 JD	NM	6700 JD	5200 JD	NM	5200 JD	900 J	NM	900 J	800 J	NM	1400 J	10500 JD	NM	<5000 U	<5000 U	NM	<5000 UJ
Chromium	(µg/L)	<5.00 U	<5.00 U	8.11	<5.00 U	<5.00 U	21.9 D	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	13.2 D	<5.00 U	<5.00 U	1.1 J	<5.00 U	<5.00 U	2.68	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	5.83 JD	8.09 JD	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<10.0 U	<5.00 U	<1.00 U	<5.00 U
Cobalt	(µg/L)	2.84 D	2.99 D	2.55	2.97 D	3.24 D	5.10 D	5.56 D	3.53 D	3.44	3.29 D	3.46 D	3.03 D	3.08 D	3.34 D	3.08	3.89 D	2.73 D	3.00	3.42 D	3.25 D	3.00	3.02 D	2.79 D	3.00 D	2.88 D	3.07 D	3.21	2.96 D	3.13 D	2.89	5.79 D	3.03 D	5.45	3.11 D
Copper	(µg/L)	<2.50 U	<2.50 U	1.02	<2.50 U	<2.50 U	<5.00 U	<2.50 U	<2.50 U	0.730 J	<2.50 U	<2.50 U	<2.50 U	<2.50 U	2.76 JD	1.64	<2.50 U	<2.50 U	0.808 J	<2.50 U	5.84 D	0.878 J	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	1.34	<2.50 U	<2.50 U	0.855 J	<5.00 U	<2.50 U	50.3	<2.50 U
Hardness	(µg/L)	NM	NM	415000	NM	NM	560000	NM	NM	470000	NM	NM	455000	NM	NM	445000	NM	NM	456000	NM	NM	446000	NM	NM	411000	NM	NM	414000	NM	NM	419000	NM	NM	412000	NM
Iron	(µg/L)	1300	384	129 J	585	465	<100 U	116 J	204 J	<100 U	192 J	319	<100 U	222 J	467	<100 U	260	276	<100 U	449	392	<100 U	429	437	<100 U	374	443	<100 U	485	438	125 J	449	750	327	470
Lead	(µg/L)	6.71 D	2.26 D	0.108 J	3.15 D	6.07 D	2.34 D	8.67 D	6.71 D	0.870	6.34 D	8.20 D	0.805 JD	6.14 D	6.63 D	0.132 J	4.25 D	5.37 D	0.656	7.77 D	5.62 D	0.146 J	10.6 D	3.51 D	<0.500 U	3.06 D	4.71 D	0.111 J	3.00 D	2.91 D	0.393	5.83 D	3.27 D	8.28	1.75 D
Magnesium	(µg/L)	50100	50900	49700	52300	53100	70100	74000	59400	58300	57900	57800	55500	54700	55900	54900	55700	55000	55800	53600	52400	54400	51700	52200	49700	50300	49800	50600	49500	51100	50700	50600	49100	49300	50700
Manganese	(µg/L)	9970	9940	9160	9680	9890	18100	18000	14900	13800	13800	13200	12000	12100	12800	12100	12200	12200	12300	12200	12400	12200	12100	11800	11300	11500	11700	11600	11600	12000	11900	12100	11500	12100	11300
Nickel	(µg/L)	25.3 D	26.8 D	25.4	24.7 D	25.8 D	54.5 D	57.3 D	38.3 D	37.1	35.3 D	35.2 D	31.3 D	33.2 D	33.5 D	29.5	30.7 D	25.9 D	26.8	32.7 D	28.1 D	27.0	27.3 D	24.1 D	24.9 D	25.7 D	23.5 D	25.7	23.8 D	24.6 D	21.9	45.1 D	26.7 D	25.9	23.8 D
Potassium	(µg/L)	2210	2240	2290	2460	2360	2500	2680	2470	2390	2460	2390	2300	2250	2350	2290	2290	2270	2330	2300	1250 JD	2260	2270	2310	2130	2260	2210	2200	2140	2270	2250	2280	2200	2190	2250
Selenium	(µg/L)	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<10.0 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 UJ	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<10.0 U	<5.00 U	<1.00 U	<5.00 U
Silver	(µg/L)	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<5.00 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<5.00 U	<2.50 U	<0.500 U	<2.50 U
Sodium	(µg/L)	4390	4520	4620	4910	4940	3700	3860	3610	3580	3660	3620	3530	3450	3700	3660	3680	3710	3850	3690	3750	3960	3820	4050	3810	4000	3980	4140	3860	4290	4180	4150	4110	4260	4410
Sulfate as SO4	(µg/L)	186000 J	186000	NM	162000 D	170000 D	NM	351000 D	254000 D	NM	234000 D	223000 D	NM	236000	NM	NM	232000	208000 D	NM	202000 D	189000 D	NM	180000 D	186000	NM	179000	164000	NM	178000	153000 D	NM	144000 D	130000 D	NM	154000 JD
Thallium	(µg/L)	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<5.00 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	5.60 D	<2.50 U	<2.50 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<5.00 U	<2.50 U	<0.500 U	<2.50 U
Vanadium	(µg/L)	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<20.0 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<20.0 U	<10.0 U	<2.00 U	<10.0 U
Zinc	(µg/L)	702	667	741	764	741	1920	1790	1070	1010	1000	951	888	881	904	864	842	835	902	784	777	747	739	680	636	629	612	600	604	589	570	587	554	1850	563

Notes:

NSES	Neihart Slope Evening Star	D	The reported value is from a dilution
AD	Adit Discharge	U	Element was analyzed for but not detected above the Method Detection Limit
L	Laboratory	J	Estimated because quality control criteria were not met
D	D in the sample name is a duplicate	B	Value was less than the Contract Required Detection Limit but greater than the Instrument Detection Limit
µg/L	micrograms per liter	NM	Not Measured
<	less than the detection limit		

TABLE 11-2
EVENING STAR ADIT WATER QUALITY PARAMETERS

Field Parameters Taken at Time of Grab Sample						
Sample Date	Time	Temp °C	pH	ORP mV	SpCond µs/cm	DO mg/L
6/5/2014	1110	8.94	6.05	202.0	853	14.04
6/12/2014	1345	10.23	6.21	249.0	825	12.17
6/18/2014	1130	7.41	6.92	289.0	565	6.87
6/27/2014	1115	7.74	7.00	253.4	841	5.94
7/10/2014	1130	8.24	7.12	267.0	847	5.96
7/23/2014	1140	8.22	7.22	224.2	838	5.4
8/5/2014	1300	8.09	7.05	178.0	820	5.41
8/21/2014	1315	7.69	7.09	143.3	807	5.07
9/3/2014	1130	7.71	7.20	182.0	781	4.83
9/18/2014	1025	7.78	7.38	100.0	800	5.94
10/1/2014	950	7.26	7.39	86.0	775	6.17
10/14/2014	1425	8.50	6.91	205.0	791	6.35
10/30/2014	1415	7.63	7.43	110.7	782	5.59
11/25/2014	1055	7.15	7.30	62.3	762	6.6
12/22/2014	1345	6.67	6.80	97.7	744	4.66
AVERAGE		7.95	7.00	176.6	789	5.75*

Notes:
*DO Average does not include June 5 or June 12, 2014 DO measurements due to inconsistency in all DO measurements at each adit on those dates.

Temp	temperature	°C	degrees Celcius
SpCond	Specific Conductivity	µS/cm	micro-Siemens per centimeter
ORP	Oxidation/Reduction Potential	mV	millivolts
DO	Dissolved Oxygen	mg/L	milligrams per liter

TABLE 12-1
LEXINGTON ADIT ANALYTICAL RESULTS FOR 2014

Sample ID		SCLX-AD-L-002	SCLX-AD-L-003	SCLX-AD-L-004	SCLX-AD-L-004	SCLX-AD-L-005	SCLX-AD-L-006	SCLX-AD-L-006	SCLX-AD-L-007	SCLX-AD-L-008	SCLX-AD-L-008	SCLX-AD-L-009	SCLX-AD-L-010	SCLX-AD-L-010	SCLX-AD-L-011	SCLX-AD-L-12	SCLX-AD-L-12	SCLX-AD-L-13	SCLX-AD-L-14	SCLX-AD-L-14
Date		2/20/2014	6/12/2014	6/18/2014	6/18/2014	6/27/2014	7/10/2014	7/10/2014	7/23/2014	8/5/2014	8/5/2014	8/21/2014	9/3/2014	9/3/2014	9/18/2014	9/30/2014	9/30/2014	10/14/2014	10/30/2014	10/30/2014
Analysis		Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals	Total Metals	Dissolved Metals	Total Metals
Aluminum	(µg/L)	1190	134	<20.0 U	204	163	<20.0 U	110	88.7	<20.0 U	75.6	74.5	<20.0 U	169	115	<20.0 U	116	93.2	47.4 J	91.7
Antimony	(µg/L)	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<5.00 U
Arsenic	(µg/L)	105 D	<2.50 U	<0.500 U	3.16 JD	4.18 JD	<0.500 U	3.18 JD	5.03 JD	<0.500 U	4.66 JD	5.00 JD	<0.500 U	4.13 JD	5.23 JD	<0.500 U	7.66 JD	5.34 JD	0.876 J	17.9 JD
Barium	(µg/L)	32.8 JD	<25.0 U	<5.00 U	<25.0 U	<25.0 U	<5.00 U	<25.0 U	<25.0 U	<5.00 U	<25.0 U	<25.0 U	<5.00 U	<25.0 U	<25.0 U	<5.00 U	<25.0 U	<25.0 U	<5.00 U	<50.0 U
Beryllium	(µg/L)	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U	<2.00 U
Cadmium	(µg/L)	20.2 D	3.71 D	4.15	5.1 D	2.98 D	2.86	2.99 D	2.75 D	2.35	2.34 D	2.03 D	4.55	3.64 D	2.82 D	2.57	2.67 D	2.92 D	4.13	3.98 D
Calcium	(µg/L)	20800	8860	10200	10400	9120	12300	11800	12700	13500	13900	14200	12300	12200	13400	14900	14600	15700	17500	15400
Chloride	(µg/L)	1100 J	600 J	NM	700 J	700 J	NM	700 J	600 J	NM	600 J	600 J	NM	600 J	500 J	NM	11400 JD	1200 J	NM	<500 U
Chromium	(µg/L)	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<10.0 U
Cobalt	(µg/L)	11.3 D	0.886 JD	1.04	1.38 D	0.736 JD	0.769	0.783 JD	0.728 JD	0.992	0.654 JD	0.638 JD	0.913	0.677 JD	0.879 JD	1.70	0.865 JD	0.777 JD	5.31	1.17 JD
Copper	(µg/L)	62.6 D	4.34 JD	2.11	6.79 D	4.25 JD	1.08	4.38 JD	3.87 JD	0.732 J	3.21 JD	3.54 JD	1.47	3.80 JD	4.63 JD	1.08	4.86 JD	3.74 JD	1.28	7.28 JD
Hardness	(µg/L)	NM	NM	39000	NM	NM	48000	NM	NM	55000	NM	NM	47000	NM	NM	63000	NM	NM	74000	NM
Iron	(µg/L)	16400	518	<100 U	788	828	<100 U	818	852	<100 U	746	900	<100 U	752	960	404	1150	857	2440	1040
Lead	(µg/L)	249 D	34.2 D	1.88	37 D	37.5 D	0.949	23.1 D	18.2 D	0.115 J	11.7 D	14.0 D	2.91 J	28.9 D	19.3 D	0.126 J	21.1 D	13.7 D	1.52	30.6 D
Magnesium	(µg/L)	9260	2510	3160	3150	2690	4210	4060	4520	5170	5330	5640	4000	3980	5200	6210	5880	6110	7270	6030
Manganese	(µg/L)	12200	714	916	1330	668	799	802	833	815	761	755	756	754	941	1010	976	832	2240	674
Nickel	(µg/L)	7.87 D	<2.50 U	1.9	<2.50 U	<2.50 U	1.38	<2.50 U	<2.50 U	1.69	<2.50 U	<2.50 U	1.86	3.87 JD	<2.50 U	3.22	<2.50 U	<2.50 U	9.40	<5.00 U
Potassium	(µg/L)	715 J	364 J	392 J	365 J	368 J	433 J	434 J	904 J	456 J	434 J	516 J	396 J	471 J	462 J	496 J	468 J	464 J	560 J	531 J
Selenium	(µg/L)	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<5.00 U	<5.00 U	<1.00 U	<10.0 U
Silver	(µg/L)	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<5.00 U
Sodium	(µg/L)	1430	669 J	744 J	735 J	704 J	872 J	824 J	858 J	884 J	928 J	970 J	824 J	875 J	917 J	1050	968 J	995 J	1100	1020
Sulfate as SO4	(µg/L)	32100	16000	NM	21200	16900	NM	21600	20000	NM	21900	23100	NM	20300	22900	NM	215000 D	22600	NM	21000
Thallium	(µg/L)	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<2.50 U	<2.50 U	<0.500 U	<5.00 U
Vanadium	(µg/L)	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<10.0 U	<10.0 U	<2.00 U	<20.0 U
Zinc	(µg/L)	4570	912	1150	1250	792	858	822	785	774	729	729	1040	1020	854	893	817	895	1460	741

Notes:

SCLX	Snow Creek Lexington	D	The reported value is from a dilution
AD	Adit Discharge	U	Element was analyzed for but not detected above the Method Detection Limit
L	Laboratory	J	Estimated because quality control criteria were not met
D	D in the sample name is a duplicate	B	Value was less than the Contract Required Detection Limit but greater than the Instrument Detection Limit
µg/L	micrograms per liter	NM	Not measured
<	less than the detection limit		

TABLE 12-2
LEXINGTON ADIT WATER QUALITY PARAMETERS

Field Parameters Taken at Time of Grab Sample						
Sample Date	Time	Temp °C	pH	ORP mV	SpCond µs/cm	DO mg/L
6/12/2014	1250	5.89	5.87	175.0	96	14.10
6/18/2014	1325	2.49	6.57	134.0	148	7.82
6/27/2014	1330	2.13	6.49	220.8	91	8.42
7/10/2014	1345	2.18	7.90	144.0	73	7.40
7/23/2014	1230	2.50	8.07	188.4	142	7.60
8/5/2014	1440	3.18	7.22	44.0	178	6.70
8/21/2014	1400	2.51	8.02	133.3	163	6.18
9/3/2014	1320	2.20	6.78	64.0	122	6.27
9/18/2014	1205	2.35	6.93	64.0	147	7.78
9/30/2014	1600	2.30	6.98	39.0	222	7.00
10/14/2014	1305	2.29	6.71	43.8	164	7.48
10/30/2014	1530	2.22	7.20	34.5	158	8.12
AVERAGE		2.69	7.06	107.07	142.00	7.34*

Notes:
*DO Average does not include June 12, 2014 DO measurements due to inconsistency in all DO measurements at each adit on that date.

Temp	temperature	°C	degrees Celcius
SpCond	Specific Conductivity	µS/cm	micro-Siemens per centimeter
ORP	Oxidation/Reduction Potential	mV	millivolts
DO	Dissolved Oxygen	mg/L	milligrams per liter

APPENDICES (ON ATTACHED CD)

A WATER QUALITY PARAMETER DATA
B ADIT FLOW MEASUREMENTS
C PRECIPITATION DATA
D ESAT WATER QUALITY DATA