GOLDEN PREDATOR EXPLORATION LTD.

BREWERY CREEK MINE

2015 ANNUAL WATER LICENSE REPORT

SUBMITTED TO THE YUKON WATER BOARD

WATER USE LICENSE QZ96-007

2015 ANNUAL QUARTZ MINING LICENSE REPORT

SUBMITTED TO YUKON GOVERNMENT, ENERGY MINES AND RESOURCES

YUKON QUARTZ MINING LICENSE A99-001

February 2016

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1 INTRODUCTION

The Brewery Creek Mine is currently owned and operated by Golden Predator Mining Corp. (Golden Predator), who signed a purchase agreement with Alexco Resource Corp. in early 2012. The property is located in central Yukon approximately 55 km east of Dawson City and was operated as a conventional open pit heap leach continuously from 1996 through 2001; reclamation and closure began in 2002. With the exception of some remaining site facilities, the mine has been closed and reclaimed. The mine closure and reclamation objectives are outlined in the 2003 Decommissioning and Reclamation Plan (DRP) required under the Water Use Licence.

The mine was operated and closed under Type A Water Use License QZ96-007 (originally issued as QZ94-003 in August 1995) and Quartz Mining License A99-001 issued in June 1999. Both licenses expire in 2021. The Water Use License was most recently amended in March of 2012 (Amendment 8, QZ11-035), which addressed updated closure conditions and monitoring. Golden Predator also holds a Type B Water Use License MN12-038, which was issued in August 2012, and expires on July 5, 2022. Under this license Golden Predator has the right to obtain groundwater and upgrade the existing septic system on site for a larger camp.

Golden Predator holds a Class 4 Mining Land Use Approval for the Brewery Creek property (LQ00364), which was updated from a Class 3 approval on July 6, 2012. With this Class 4 approval, Golden Predator has been able to extend their exploration beyond the previous license boundaries.

This report summarizes the 2015 monitoring data and activities relevant to the Water Use License QZ96-007, and the Quartz Mining License A99-001. Many aspects of the required monitoring under QZ96-007 and A99-001 have now been completed.

2 OVERVIEW OF ACTIVITIES

As of 2015, under Water-Use License QZ96-007, compliance monitoring of surface and groundwater is annual, with the exception of a five sites that are semi-annual if they are actively discharging. The following tasks and activities were completed in 2015:

September 2015

- Site inspection;
- Collection of leveloggers;
- Annual compliance surface water and groundwater and monitoring ; and
- Inspection, download and winterizing of meteorological station.

3 MONITORING PROGRAMS AND STUDIES

3.1 WATER USE

There was no water withdrawn from the authorized sources (Laura Creek, Lucky Creek, Pacific Creek, Lee Creek, North Fork of the South Klondike River, and the South Klondike River,) or the well located at BC-23 during 2015.

3.2 CLIMATE

Requirements under QZ96-007 for the climatic monitoring is described in the Solutions Management Plan, as well as the Blue Zone Monitoring and Assessment Program, and the Heap Leach Pad Cover and Facilities Monitoring Program. As per these programs, climatic monitoring was discontinued in 2010 under QZ96-007 as the heap was deemed detoxified according to specific monitoring requirements ("detoxification of the heap shall be deemed to have occurred when the concentration of Total Cyanide measured at monitoring station BC-28a in accordance with Schedules A and B is equal to or lower than 2.0 mg/L for five consecutive years of monitoring"). However, Golden Predator continues to perform climatic monitoring even though requirements under QZ96-007 have been fulfilled.

A Campbell Scientific weather station is installed on site and collects weather data continuously. The data are downloaded in conjunction with the compliance water quality and hydrology monitoring program, at which point the station is also inspected to ensure it is functioning properly and any necessary maintenance is performed.

The meteorological station was last visited and downloaded on 1 October 2015. A meteorological data summary memorandum is presented in Appendix A and includes a tabular summary of the 2015 data available.

3.3 SURFACE WATER QUALITY MONITORING

3.3.1 *Surface Water Sampling Methods*

Monitoring and sampling was carried out in accordance with the procedures and standards described in the Guidance Document for the Sampling and Analysis of Metal Mining Effluents (April 2001, EPS2/MM/5, Minerals and Metals Division, Environment Canada). All samples were preserved and filtered on the day of collection, where applicable, and were kept cool throughout shipment to Maxxam Analytics Inc. Samples were analyzed for the following parameters:

- Routine parameters (conductivity, pH, alkalinity, hardness, hydroxide, carbonate);
- Total suspended and dissolved solids (TSS/TDS);
- Ammonia;
- Anions (nitrite, nitrate, fluoride, sulphate, cholride, bromide, ortho-phosphate);
- Dissolved organic carbon (DOC);

- Cyanide (Weak Acid Dissociable and Total); and
- Total and dissolved metals (suite of 33 metals, including all parameters found in the CCME and MMER guidelines).

QA/QC samples, such as duplicates and field and trip blanks were collected as part of each sampling event.

3.3.2 *Water Quality Guidelines*

Clause 46 of Water Licence QZ96-007 states that:

"Water quality at monitoring stations BC-31, BC-34 and BC-39 shall not exceed the water quality guidelines specified for the protection of aquatic life contained in the Canadian Environmental Quality Guidelines prepared by the Canadian Council of Ministers of Environment, as amended from time to time."

As such, for the receiving water quality data assessment, water quality parameters were screened against Canadian Water Quality Guidelines for Protection of Aquatic Life (CWQG; CCME 2012). Relevant guidelines are presented in Table 3-1.

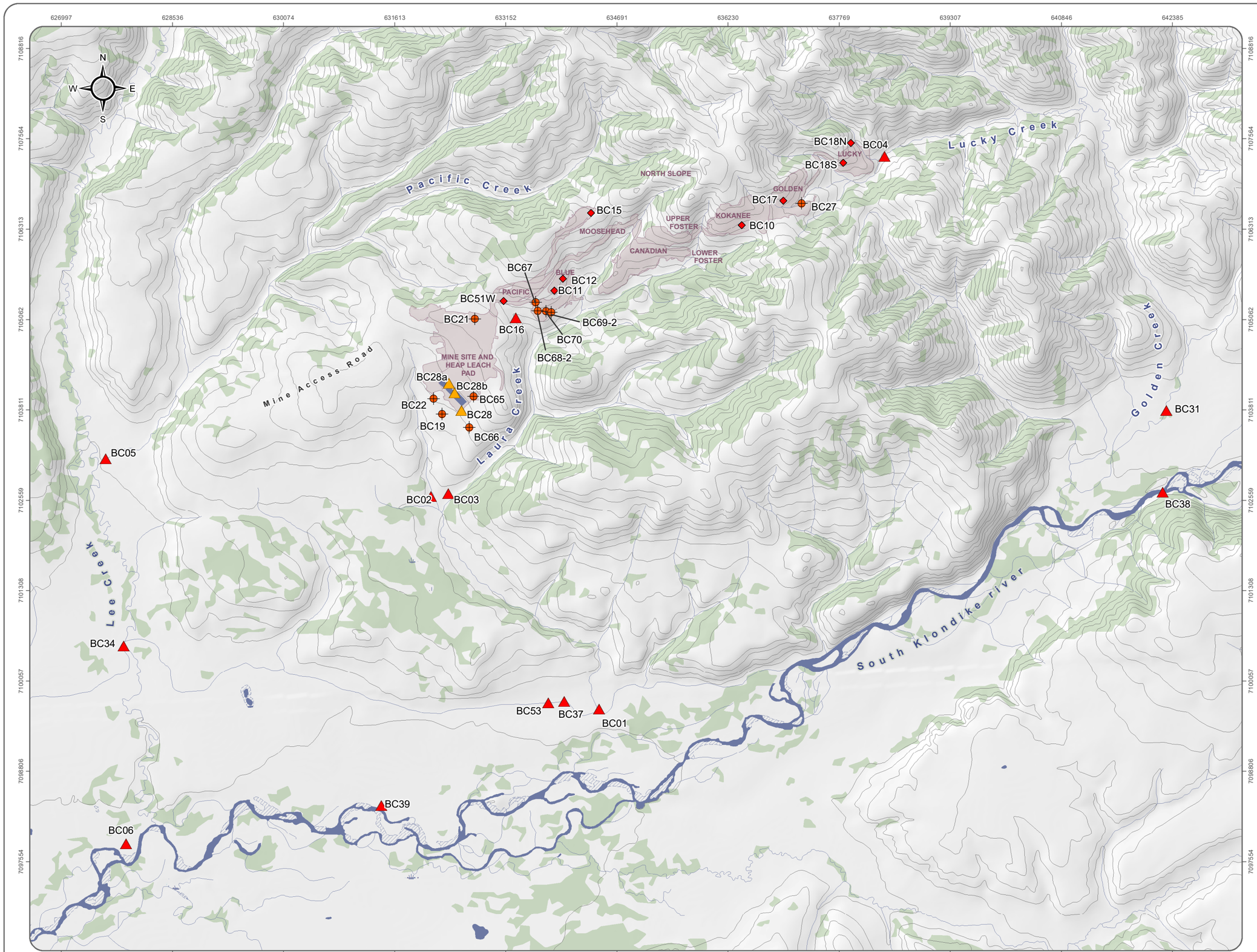
The Water Licence also specifies a site specific guideline for total selenium of 0.0038 mg/L at BC-39.

Table 3-1 Canadian Water Quality Guidelines

Parameter	Units	Guideline	
		Source	Value
Aluminum*	µg/L	CWQG	100
Arsenic	µg/L	CWQG	5
Cadmium**	µg/L	CWQG	$10^{0.83[\log10(\text{hardness})]-2.46}$
Chromium	µg/L	CWQG	1
Copper	µg/L	CWQG	$e^{0.8545[\ln(\text{hardness})]-1.465} * 0.2$
Cyanide - WAD	µg/L	CWQG	5
Iron	µg/L	CWQG	300
Lead	µg/L	CWQG	$e^{1.273[\ln(\text{hardness})]-4.705}$
Mercury	µg/L	CWQG	0.026
Molybdenum	µg/L	CWQG	73
Nickel	µg/L	CWQG	$e^{0.76[\ln(\text{hardness})]+1.06}$
Nitrate Nitrogen	µg/L	CWQG	3000
Selenium	µg/L	CWQG/SSWQS	1/3.8
Silver	µg/L	CWQG	0.25
Thallium	µg/L	CWQG	0.8
Zinc	µg/L	CWQG	30
pH	pH units	CWQG	6.5 - 9.0

**If pH ≥ 6.5*

***Cadmium has two guidelines: one for short term exposure and one for long term exposure. Only the long term guideline is presented here as it is the most conservative.*



BREWERY CREEK MINE

FIGURE 3-1
WATER QUALITY STATIONS

- Surface Water
- Groundwater
- Heap Effluent
- Pit/Dump Discharge

NAD 83 UTM Zone 7N

0 0.5 1 2 Kilometers

1:50,000 (when printed on 11 X 17 inch paper)

ALEXCO ENVIRONMENTAL GROUP

FEBRUARY 2016

D:\Project\All Projects\BreweryCreek\Maps\1_Overview_Maps\WQ_Stations\WQ_Stations_20160224.mxd
(Last edited by: mducharme;2016-02-24/17:54 PM)

3.3.3 *Surface Water Quality Results*

Surface water quality monitoring stations are presented in Figure 3.1. Water License QZ96-007 specifies three compliance points for surface water quality: BC-31, BC-34, and BC-39, that must meet CCME Guidelines for the Protection of Aquatic Life. There were no exceedances of these guidelines for any parameters during 2015 at BC-31 or BC-34, with the exception of elevated levels of total selenium. The CCME guideline for total selenium is 0.001 mg/L. The results of the September 2015 compliance monitoring trip indicated that both BC-31 (0.0017 mg/L) and BC-34 (0.0021 mg/L) exceeded for selenium. However, it should be noted that in the past every time the compliance station exceeded the associated upstream reference station also exceeded, indicating that higher concentrations of selenium are typical of the area.

Compliance station, BC-39, was below the CCME water quality guidelines for all parameters for the September 2015 compliance monitoring event. BC-39 was also under the site specific maximum allowable selenium concentration of 0.0038 mg/L during the monitoring events in 2015.

All surface water data and insitu parameters are summarized and compared to CCME Guidelines for the Protection of Aquatic Life in a table provided in Appendix B, which also includes plots and a brief discussion of historical trends. The original lab reports are provided in Appendix C and field reports are provided as Appendix D, which includes photos of the sites.

3.4 GROUNDWATER QUALITY

3.4.1 *Groundwater Sampling Methods*

Monitoring and sampling was carried out in accordance with the procedures and standards described in the *Standard Guide for Sampling Ground-Water Monitoring Wells* (STM D4448-01, ASTM International, PA, USA). All samples were preserved and filtered on the day of collection, where applicable, and kept cool until shipment to Maxxam Analytics Inc. Samples were analyzed for the following parameters:

- Routine parameters (conductivity, pH, alkalinity, hardness, hydroxide, carbonate);
- Total dissolved solids;
- Ammonia;
- Anions (nitrite, nitrate, fluoride, sulphate, chloride, bromide, ortho-phosphate);
- Cyanide (Weak Acid Dissociable and Total); and
- Dissolved metals (suite of 33 metals at low level detection limits).

QA/QC samples were collected as part of each sampling event.

3.4.2 *Groundwater Results*

There are ten groundwater wells that are required to be monitored annually under the Water License, with the exception of two of these wells, BC-65 and BC-66, are compliance points for the site that are semi-annual if the

heap land application is discharging. BC-66(1) is the shallow of the two nested wells and was dry. BC-66 (2) is the deeper well. Water levels and samples were collected on 1 October 2015 for BC-65 and BC-66 (2). The results of these two samples were all well below the site specific maximum allowable concentrations specified within Clause 43 of Water License QZ96-007, as shown in Table 3-3.

Table 3-2 BC-66 Site Specific Max Allowable Concentrations

		Station Name	BC-65	BC-66 (2)
Description	**Units**	**QZ96-007 Standards**	**Land Application Piezometer**	**Land Application Piezometer (Deep Well)**
Sample Date			**01/10/2015**	**01/10/2015**
Ammonia Total	mg/L	7.5	0.018	0.0079
Cyanide, Total	mg/L	1	<0.00050	0.00338
Cyanide, Weak Acid Dissociable	mg/L	0.125	<0.00050	0.00124
Aluminum (Al), Dissolved	mg/L	3	0.0085	0.00078
Antimony (Sb), Dissolved	mg/L	0.5	0.00347	0.000124
Arsenic (As), Dissolved	mg/L	0.25	0.000377	0.000181
Bismuth (Bi), Dissolved	mg/L	0.25	<0.0000050	<0.0000050
Cadmium (Cd), Dissolved	mg/L	0.05	0.000073	0.000012
Chromium (Cr), Dissolved	mg/L	0.24	0.00086	<0.00010
Copper (Cu), Dissolved	mg/L	0.1	0.00404	0.00023
Iron (Fe), Dissolved	mg/L	5	0.0113	<0.0010
Lead (Pb), Dissolved	mg/L	0.1	0.000013	0.000011
Manganese (Mn), Dissolved	mg/L	6	0.00444	0.000365
Molybdenum (Mo), Dissolved	mg/L	0.25	0.000442	0.000178
Nickel (Ni), Dissolved	mg/L	0.25	0.0052	0.000393
Selenium (Se), Dissolved	mg/L	0.3	0.0027	0.0147
Silver (Ag), Dissolved	mg/L	0.05	<0.0000050	<0.0000050
Zinc (Zn), Dissolved	mg/L	0.25	0.0185	0.00175

In October 2015, eight wells were successfully sampled, while the remaining wells were either frozen, blocked, or dry. All of the water level data and water sampling data for the remaining wells are provided in Appendix B, which also includes plots and a brief discussion of historical trends. The original lab reports are provided in Appendix C and field reports are provided as Appendix D, which includes photos of the sites.

3.5 IN-PIT AND HEAP EFFLUENT MONITORING STATIONS WATER QUALITY RESULTS

3.5.1 *Methods*

Mined out pits were used effectively as sediment control basins. Snow melt and precipitation run-off was directed to the closest inactive pit. Samples from all pits were taken from surface standing water within each

pit. All samples were preserved and filtered on the day of collection, where applicable, and were kept cool until shipment to Maxxam Analytics Inc. Samples were analyzed for the following parameters:

- Routine parameters (conductivity, pH, alkalinity, hardness, hydroxide, carbonate);
- Total suspended and dissolved solids;
- Ammonia;
- Anions (nitrite, nitrate, fluoride, sulphate, chloride, bromide, ortho-phosphate);
- Cyanide (Weak Acid Dissociable and Total); and
- Total and dissolved metals (suite of 33 metals, at low level detection limits).

QA/QC samples were collected as part of each sampling event.

3.5.2 *Effluent Quality Standards*

During the 2012 Mine Engineering Inspection, Brewery Creek mine was completing management of the waters stored in the ponds below the heap. Inspection of the discharge channel from the outflow of the overflow pond siphon pipe (final discharge point) has demonstrated each year that the discharge water goes to ground and does not enter any receiving surface water directly. The heap effluent now infiltrates into the ground within the reclaimed ponds which meets water license requirements. In 2015, no effluent was discharged from the heap or the biological treatment or overflow ponds, and as such the effluent quality standards prescribed in Clause 44 do not apply. Samples BC-28, 28a, and 28b were collected in October 2015 from each of these sites but the water sampled is still water that is pooling faster than infiltration can occur.

The lysimeter compliance point, BC-70, is held to the same site specific maximum allowable standards as the wells, BC-65 and BC-66. The lysimeter reservoir was dry during each compliance monitoring trip and could therefore not be sampled.

3.5.3 *Results*

In-pit and heap effluent samples were collected from the following stations:

- BC-10: Kokanee Pit and Dump
- BC-12: Blue Pit
- BC-15: Moosehead Pit
- BC-16: Pacific Gulch
- BC-17: Golden Pit and Dump
- BC-18N: Lucky Pit and Dump (North side)

- BC-28: Overflow Pond
- BC-51W: Pacific Pit
- BC-53: Laura Creek Wetland

Stations located at BC-9 (Upper Foster Pit and Dump), BC-13 (Moosehead West Waste Dump) and BC-14 (Moosehead East Waste Dump) were removed from license QZ96-007 in Amendment #8 and are therefore no longer required to be monitored.

Based on the September 2015 field activities, the following noteworthy observations were made:

- Water that is contained in all pits either exfiltrates or evaporates.
- Lucky pit and dump sites, BC-18N and BC-18S, did not have water present during sampling events. These sites have been reclaimed. BC-18N is dry and BC-18S is a grassy reclaimed hillslope with trees quickly filling in. BC-11, Blue Waste Dump, is a grassy hillslope with no signs of surface water running at any time of year, it is being rapidly reclaimed by trees. We recommend BC-18N, BC-18S and BC-11to be removed from the monitoring schedule. Photos are included in Appendix D as part of the field reports.
- Pacific gulch, BC-16, is the overflow draining from Pacific pit. This channel is dry and appears to have been for some time. It is likely that water flows during spring melt only.
- BC-12 (Blue Pit) is surrounded with very soft muddy sediment and gravel. It is extremely difficult to sample the water without causing a plume of very light orange precipitate to emanate from the shore. As such it is quite possible that the samples could be adversely affected.
- pH levels in Pacific Pit (BC-51W) remained consistently low since 2008 and again were observed to be low in 2015.
- Aside from arsenic and selenium, BC-10, BC-15 and BC-17 exhibited metal concentration values within normal ranges.

3.6 BIOASSAY MONITORING

Bioassays were not collected during 2015 as the site was not actively discharging.

3.7 HYDROLOGY

Stream flow measurements for stations situated along Laura Creek, Golden Creek, Lucky Creek, Lee Creek, and Pacific Creek were conducted in 2015 during the regularly scheduled monitoring period, where conditions allowed. Measurements were taken according to the procedures and standards described in the *Guidance Document for Flow Measurement of Metal Mining Effluents* (April 2001, EPS 2/MM/4, Mineral and Metal Division, Environment Canada), and all data are presented in Table 3-4.

Table 3-3 Summary table of Stream Flow Measurements (L/sec)

	29 Sept
BC-1	210.6
BC-2	20.7
BC-3	171.3
BC-4	56.8
BC-5	224.8
BC-31	1123.4
BC-37	
BC-39	3.8
BC-53	202.3

Due to BC-53's difficult access, it was recommended that BC-37 become the site for BC-53. BC-37 is located a few hundred meters upstream and water quality, as well as discharge should be effectively similar.

3.8 SEDIMENT AND BENTHIC MONITORING

There was no sediment or benthic monitoring completed in 2015, as water license requirements for this site were only required until 2009. Sediment and benthic monitoring were last completed in 2012 as part of Golden Predator's extended baseline monitoring program at Brewery Creek.

3.9 LEAK DETECTION AND RECOVERY SYSTEMS

The leak detection piping and collection system remains intact but the monitoring of (LDRS) systems was discontinued in 2005, consistent with long-term closure plans and the fact the heap has been fully decommissioned and drained.

3.10 AIR QUALITY

No air quality monitoring for mercury emissions was conducted in 2015. Refining activities were discontinued resulting in the dismantlement of the ADR facility in 2004.

3.11 EFFECTS ON WILDLIFE

The fence constructed in June 2006 to prevent wildlife from entering the process ponds was removed in 2008 during the final reclamation of the ponds. There is no liner remaining on site to pose any wildlife entrapment risk. The site was inspected regularly throughout the year and there was no wildlife mortalities observed during 2015. Among the wildlife observed throughout the year were moose, and porcupine, as well as caribou signs.

4 ADDITIONAL PLANS AND STUDIES

4.1 ADAPTIVE MANAGEMENT PLAN

As part of the Adaptive Management Plan there are actions to be taken if BC-39 exceeds the site specific maximum allowable total selenium concentration of 3.8 µg/L. However, the concentration of selenium at BC-39 in 2015 was 0.57 µg/L, and therefore did not trigger any mitigative actions.

4.2 IMPACT STUDY OF LOWER LAURA CREEK

The purpose of the study is to characterize the potential effects to Lower Laura Creek and the South Klondike River resulting from the release of effluents from the project. The report summarizes data collected as part of the licensed monitoring program conducted on Laura Creek and the South Klondike River during the period 2008 – 2013. As per Water-Use License QZ96-007 the Lower Laura Creek Impact Study is submitted every three year with the last study conducted in 2013. The next study will be conducted in 2016.

5 REAGENT AND WASTE MANAGEMENT

5.1 SPILL OCCURRENCE AND RESPONSE

There were no reportable spills that occurred in 2015.

5.2 REAGENT STORAGE AND HANDLING

Other than some miscellaneous laboratory chemicals, there are no reagents or chemicals in storage at the Brewery Creek Mine.

6 WATER MANAGEMENT

6.1 DIRECT RELEASE

There was no direct release of solution in 2015. Heap drainage is diverted into the barren pond (biological treatment cell) and overflows into the overflow pond where it infiltrates into the ground. The infiltrating water meets water license discharge requirements. Heap surface water is directed to the pregnant pond (now sediment settling pond) where it likewise infiltrates into the ground. In 2015, no effluent was discharged from the heap or the biological treatment or overflow ponds, and as such the effluent quality standards prescribed in Clause 44 do not apply. Samples BC-28, 28a, and 28b were collected in October 2015 from each of these sites but the water sampled is still water that is pooling faster than infiltration can occur.

Vista Tek Ltd. Reported that at the time of the 2014 inspection, the barren pond was noted to be approximately 90% full and the overflow pond and pregnant ponds approximately 25% full. Golden Predator (per. com. 2014 Mike Maslowski, Director Operations to Victor Menkal, P. Eng.) has indicated that they are currently evaluating alternatives to undertake management of the water contained in the pond on a long term basis.

7 GEOTECHNICAL INVESTIGATION

A geotechnical engineering inspection is required under Water Use License QZ96-007 every five years, starting in 2009. The last inspection conducted was by Victor Menkal, P.Eng. of Vista Tek Ltd. in 2014. The next inspection will be conducted in 2019.

8 CONCLUSION

A summary of the key points of this report are as follows:

- There was no direct release of solution in 2015. The heap drainage is diverted into the barren pond which passes into the overflow pond where it infiltrates into the ground. Heap surface water is directed to the pregnant pond (now sediment settling pond) where it likewise infiltrates into the ground. The ponds are partially filled as precipitation and run-off is greater than the infiltration rate. As there was no discharge in 2015 the BC-28, 28a, or 28c samples did not trigger the effluent quality standards in Clause 44.

- Water License QZ96-007 specifies three compliance points for surface water quality:

    - BC-31 and BC-34, that must meet CCME Guidelines for the Protection of Aquatic Life. There were no exceedances of these guidelines for any parameters during 2014 at BC-31 or BC-34, with the exception of elevated levels of total selenium. The CCME guideline for total selenium is 0.001 mg/L and during the September 2015 compliance monitoring trip selenium exceeded these levels at both BC-31 and BC-34.

    - BC-39, was below the CCME water quality guidelines for all parameters for the September 2015 compliance monitoring event. The BC-39 sampling event was also below the site specific maximum allowable selenium concentration of 0.0038 mg/L in 2015.

- The wells BC-65 and BC-66, are compliance points for the site. BC-66(1) was dry in 2015. BC-66 (2) is the deeper well and water levels and samples were collected in September 2015. The results of BC-66 (2) were all well below the site specific maximum allowable concentrations specified within Clause 43 of Water License QZ96-007.

- The lysimeter compliance point, BC-70, is held to the same site specific maximum allowable standards as the wells, BC-65 and BC-66. The lysimeter reservoir was dry during each compliance monitoring trip and could therefore not be sampled.

APPENDIX A

CLIMATE DATA SUMMARY MEMO

3 Calcite Business Centre, 151 Industrial Road
Whitehorse, Yukon Y1A 2V3
Phone (867) 668-6463 Fax (867) 667-6680
www.accessconsulting.ca

Memorandum

To: Golden Predator Corp.

From: Catherine Henry, Access Consulting Group

CC: Kai Woloshyn, Access Consulting Group

Date: February 25, 2016

Re: Brewery Creek Mine Site Meteorological Data Summary

1. INTRODUCTION

This memo summarizes the data collected since November 2011 at the Brewery Creek Campbell Scientific meteorological station, and compares it to data collected at the site since 1991 and to regional data. The current meteorological station was commissioned on November 9, 2011 and is located at the following coordinates: (64.040669; -138.27948) and at an elevation of 837 m above sea level. For comparison, the Dawson City Airport meteorology station, operated by Environment Canada, is approximately 40km west and the Midnight Dome snow course, operated by the Government of Yukon Water Resources Branch, is approximately 55kms west. Figure 1 shows the relative location of the Brewery Creek meteorological station to Dawson A and the Midnight Dome snow course (Yukon Environment, Water Resources).

BREWERY CREEK

FIGURE 1:
LOCATION OF BREWERY CREEK METEOROLOGICAL STATION RELATIVE TO DAWSON A AND MIDNIGHT DOME

BLACKSTONE RIVER
DEMPSTER KLONDIKE
GRIZZLY CREEK
WOLF CREEK
NORTH KLONDIKE
BREWERY CREEK
LITTLE SOUTH KLONDIKE
KLONDIKE (ABOVE BONANZA)
DAWSON CITY
MIDNIGHT DOME
DAWSON AIRPORT
KING SOLOMON DOME

OGILVIE MOUNTAINS
TINTINA TRENCH
TOP OF THE WORLD HIGHWAY
DEMPSTER HIGHWAY
KLONDIKE HIGHWAY

- Weather Station
- WSC - Hydrometric Station
- YG - Snow Survey Station
- EC- Meteorologic Station
- DIAND - Hydrometric Station
- Highway
- Road
- Watercourse
- Waterbody
- Quartz Mining Lease
- Brewery Creek Mining Area

1:650,000 when printed on 11 x 17 inch paper.
0 5 10 20 30 40 Kilometers

NAD 83 UTM Zone 7N

I:\BreweryCreek\Maps\1_Overview_Maps\Specific_Topics\WeatherStations\WeatherStations20121205.mxd (*Last edited by: jpan; 12/19/2012/16:05 PM*)

2. INSTRUMENTATION

The Brewery Creek Campbell Scientific station consists of a ten meter tower and of the following components:

Component	Model
Relative Humidity and Air Temperature Probe	HC2-S3-L
Pyranometer	SP-Lite2
Tipping Bucket	TE525WS
Snowfall Conversion Adaptor	CS705
Wind Speed and Direction Sensor	05103AP-10-L
Barometric Pressure Sensor	61302V
Solar Panel	MSX20R
Datalogger	CR800
Battery	BP12

3. NOTES AND DATA GAPS

- Three months of data from December 2011 to February 2012 were lost due to power failure.
- In April 2012, the relative humidity sensor was found to be malfunctioning and was sent back to Campbell Scientific for repair. A replacement sensor was installed at the same time to avoid data loss.
- Evapotranspiration is calculated based on several parameters, including relative humidity (RH) and wind speed, and is therefore invalid for the period where RH or wind speed is invalid.
- Precipitation is collected using a tipping bucket rain gauge with a snowfall conversion adapter mounted in the winter months.
- The snowfall conversion adaptor was incorrectly removed on May 24, 2012, causing precipitation data to be invalid between then and June 19, 2012, when the problem was corrected.
- The cylinders of the snowfall conversion adaptor were inverted upon installation on September 19, 2012, potentially causing undercatch and underestimation of snowfall. The situation was rectified on November 20, 2012.
- The station was down from January 22, 2013 to February 11, 2013, and from January 10th to January 25th, 2014, due to low battery voltage.
- In 2013, the snowfall conversion adaptor was removed on July 24 and reinstalled on October 7. In 2014, it was removed on May 31 and reinstalled on October 4. Any snow fallen between those dates would not have been recorded.

- Precipitation values for June and July 2013 are very low. Because the snowfall conversion adaptor was still in place until late July, it is suspected that evaporation lowered the antifreeze level enough to prevent most of the new precipitation to reach the overflow and tube and to flow into the tipping bucket.

- The station was not maintained in 2015, precipitation values may not be accurate due to presence of ice, slush or debris in the snowfall conversion adaptor and the fact that is was left in place during the summer.

- The station was last downloaded on October 1, 2015.

4. 1991-2010 DATA REVIEW

Meteorological data has been collected at Brewery creek intermittently since 1991:

- Manual temperature and precipitation measurements were collected intermittently from 1991 to August 1995;

- An automated station was installed on the knoll above the leach pad in August 1995. It collected hourly temperature, relative humidity, precipitation, wind magnitude and direction and solar radiation;

- The automated station was relocated to the top of the administration building in April 1997;

- Due to concerns regarding the reliability of the automated weather station, a manual weather station was established at the mine camp in the spring of 1996. Weather observations, maximum, minimum and current temperature measurements were recorded twice daily, and the precipitation gauge was measured and emptied weekly;

- The manual station was relocated to the top of the administration building at the same time as the automated one in April 1997;

- From May 1991 until the establishment of the manual station in April 1997, measurements from a precipitation gauge located near the automated stations were recorded;

- In 1997, an evaporation pan was established between the overflow and intermediate ponds;

- Climate monitoring was discontinued at the end of 2010 as updates to the Blue WRSA infiltration rate and the Heap water balance carried out in 2009 showed that detoxification of the heap had occurred and monitoring results at BC-28a had met the requirement laid out in Part E, Clause 8 of licence QZ96-007 Amendment #7.

5. RESULTS

The Campbell Scientific CR800 datalogger is set with a scanning interval of 10 seconds, and records hourly and daily data, which have been compiled into a monthly summary presented below. Note that results shown in grey italics were compiled based on incomplete hourly or daily data.

Table 1 Brewery Creek Monthly Meteorological Data Summary 2011-2015

Year	Month	Monthly Air Temperature (°C)					Monthly Average Solar Radiation (kW/m²)	Monthly Total Precipi-tation (mm)	Monthly Average Relative Humidity (%)	Monthly Average Pressure (hPa)	Monthly Average Wind Speed (m/s)	Monthly Maximum Wind Speed (m/s)	Monthly Total Evapo-transpiration (mm)	Comments
		Extreme Minimum	Average Minimum	Mean	Average Maximum	Extreme Maximum								
2011	11	*-33.29*	*-23.22*	*-21.46*	*-19.68*	*-10.54*	*0.005*	*20.58*		*994.67*	*0.46***	*11.37***		Station commissioned on Nov. 9th - 15 complete days
2011	12													Data lost
2012	1													Station down
2012	2													Only 3 complete days - monthly not calculated
2012	3	-24.68	-14.72	-11.70	-7.88	5.23	0.090	6.10		995.39	2.37	16.74		RH sensor malfunctioning - needs replacement
2012	4	-12.60	-1.20	2.15	5.74	9.31	0.174	*0*	*53.2*	1005.67	3.15	12.13	*5.10*	5 complete days for RH and ET
2012	5	-5.37	3.27	6.68	10.07	18.02	0.196	*5.34*	51.5	1004.18	4.12	16.69	45.41	Precip: 23 complete days
2012	6	5.36	10.33	13.95	17.62	25.75	0.213	*20.57*	54.9	1005.19	2.50	19.59	37.59	Precip: 11 complete days
2012	7	5.40	10.21	13.96	17.81	25.13	0.212	62.49	60.7	1008.78	2.74	17.78	35.19	
2012	8	0.507	8.59	12.30	16.38	21.73	0.167	33.54	62.1	1008.70	2.31	12.95	28.20	
2012	9	-2.756	4.49	7.26	10.21	18.22	0.088	28.71*	57.8	1003.48	3.89	17.21	35.22	
2012	10	-19.22	-8.22	-6.21	-4.28	7.24	0.031	27.68*	73.2	1010.88	1.83	12.41	7.42	
2012	11	-34.45	-22.93	-21.03	-18.80	-10.44	0.01	13.72*	71.44	1007.23	*0.50***	*8.31***	*0.65*	
2012	12	-38.87	-25.69	-23.38	-21.15	-1.69	0.00	20.57	69.64	1000.67	*1.05***	*11.23***	*1.06*	
2013	1	*-30.64*	*-17.26*	*-14.67*	*-11.96*	*-1.24*	*0.00*	*22.86*	*76.07*	*1005.41*	*1.72***	*15.61***	*2.02*	Station down on Jan.22 - 21 complete days of data
2013	2	*-25.90*	*-14.08*	*-11.90*	*-9.18*	*-0.06*	*0.02*	*4.67*	*74.36*	*996.92*	*2.34***	*16.13***	*3.27*	Station back online on Feb.11 - 17 complete days of data
2013	3	-26.22	-14.34	-11.23	-7.63	3.68	0.10	0.00	54.80	1008.95	2.79	20.80	10.63	
2013	4	-18.34	-11.35	-7.21	-3.26	4.31	0.19	0.15	48.11	1008.60	3.31	18.92	17.20	

Year	Month	Monthly Air Temperature (°C)					Monthly Average Solar Radiation (kW/m²)	Monthly Total Precipi-tation (mm)	Monthly Average Relative Humidity (%)	Monthly Average Pressure (hPa)	Monthly Average Wind Speed (m/s)	Monthly Maximum Wind Speed (m/s)	Monthly Total Evapo-transpiration (mm)	Comments
		Extreme Minimum	Average Minimum	Mean	Average Maximum	Extreme Maximum								
2013	5	-7.51	1.17	5.33	9.25	21.73	0.22	4.96	54.05	1007.81	3.33	17.11	34.58	
2013	6	3.65	11.36	15.70	20.11	29.30	0.26	0.00***	50.03	1010.55	2.91	16.26	49.90	
2013	7	6.81	11.43	15.40	19.39	25.13	0.23	3.07***	54.73	1011.57	2.69	13.67	45.48	
2013	8	2.09	10.64	14.40	18.41	28.02	0.17	15.32	56.73	1006.11	2.49	13.65	37.39	
2013	9	-5.24	3.25	5.99	9.30	17.62	0.08	32.98	71.34	999.49	3.50	21.17	20.48	
2013	10	-9.58	-1.08	0.63	2.56	6.79	0.03	16.64	74.27	1004.77	3.24	16.18	12.81	
2013	11	-36.56	-17.89	-15.23	-12.11	-0.34	0.01	9.63	73.70	1006.96	1.87	15.88	3.64	
2013	12	-33.98	-24.92	-22.54	-20.01	-0.59	0.00	9.77	66.97	1010.37	*1.27***	*17.81***	*1.76*	Wind: 24 complete days
2014	1	*-25.21*	*-11.82*	*-9.68*	*-7.23*	*3.41*	*0.01*	*4.09*	*78.52*	*1005.10*	*2.29***	*16.33***	*2.059*	Station down: 15 complete days, 4 partial days; wind and ET: 8 complete days, 9 partial days
2014	2	-34.20	-21.33	-17.82	-13.28	-2.01	0.03	3.50	63.36	1008.37	*1.56***	*23.19***	*3.847*	wind and ET: 21 complete days, 7 partial days
2014	3	-23.79	-12.08	-8.82	-4.90	3.48	0.11	1.02	41.24	1005.31	2.69	16.05	16.167	
2014	4	-17.66	-3.31	0.21	3.79	9.76	0.17	7.30	47.19	1001.89	3.43	13.98	28.628	
2014	5	-2.49	4.77	8.94	12.95	20.56	0.22	5.11	41.04	1010.10	3.06	21.49	47.014	
2014	6	2.61	7.75	11.89	15.86	23.91	0.22	33.27	50.87	1005.45	3.17	15.84	45.836	
2014	7	6.27	10.68	14.12	17.93	23.60	0.19	44.36	60.91	1007.21	2.55	16.33	34.904	
2014	8	1.55	8.41	11.52	15.20	20.70	0.14	44.80	69.29	1005.99	2.81	12.77	27.3	
2014	9	-5.10	2.69	5.56	8.84	16.12	0.10	19.71	58.45	1004.59	3.15	16.86	27.676	
2014	10	-11.88	-4.83	-2.99	-0.97	5.75	0.02	43.92	79.58	994.40	*3.16***	*17.04***	*8.79*	wind and ET: 26 complete days, 4 partial days
2014	11	-29.76	-14.19	-12.18	-10.06	0.05	0.01	0.00	74.12	1007.86	*1.69***	*16.11***	*3.87*	wind and ET: 26 complete days, 3 partial days

Year	Month	Monthly Air Temperature (°C)					Monthly Average Solar Radiation (kW/m²)	Monthly Total Precipi-tation (mm)	Monthly Average Relative Humidity (%)	Monthly Average Pressure (hPa)	Monthly Average Wind Speed (m/s)	Monthly Maximum Wind Speed (m/s)	Monthly Total Evapo-transpiration (mm)	Comments
		Extreme Minimum	Average Minimum	Mean	Average Maximum	Extreme Maximum								
2014	12	-24.54	-14.09	-11.72	-9.29	0.73	0.00	0.00	75.45	1000.38	*2.40***	*14.04***	*4.25*	wind and ET: 17 complete days, 5 partial days
2015	1	-35.48	-19.00	-16.51	-13.58	0.04	0.00	8.32	70.38	1006.89	*1.54***	*13.31***	*2.73*	wind and ET: 28 complete days, 3 partial days
2015	2	-34.18	-16.92	-14.82	-12.01	1.55	0.02	15.32	71.65	1005.06	*1.72***	*23.19***	*3.50*	wind and ET: 23 complete days, 5 partial days
2015	3	-29.50	-10.99	-8.03	-4.71	5.77	0.09	8.90	55.39	999.91	3.21	16.21	15.57	
2015	4	-5.78	-1.76	1.48	5.08	10.54	0.16	0.00	51.52	999.13	4.16	16.36	32.33	
2015	5	-3.16	8.08	12.70	17.21	26.37	0.25	7.59	34.05	1010.25	3.46	16.10	62.84	
2015	6	1.54	8.78	12.94	17.14	23.71	0.22	24.67	50.09	1007.83	2.54	15.78	39.90	
2015	7	6.69	9.99	13.50	17.44	25.57	0.20	49.33	62.31	1006.05	2.35	14.75	31.73	
2015	8	-0.53	6.70	10.22	13.92	25.10	0.14	56.63	65.86	1005.41	2.29	13.80	23.73	
2015	9	-4.35	1.50	4.31	7.97	15.27	0.09	32.26	63.88	1000.97	*1.92***	*14.79***	*14.29*	wind and ET: 26 complete days, 4 partial days

**Precipitation may be underestimated (due to potential undercatch caused by snowfall cylinders inverted upon installation Sept.19). Situation rectified on November 20, 2012.*
***Wind speeds may be underestimated due to periodic icing of the wind sensor*
****Precipitation values suspiciously low. Snowfall adaptor still in place - antifreeze level may have dropped too low*

5.1. Air Temperature

Table 2 and Figure 2 below present air temperature monthly extreme and average minima, means and extreme and average maxima for the period 1994-2010. Note that this summary is largely based on partial monthly data. Individual annual data traces and tables are shown in Appendix A.

Table 2 Brewery Creek Air Temperature Monthly Summary 1994-2010

Parameter	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann.
Extreme Minimum	-43.5	-46.0	-39.9	-21.5	-13.7	-5.2	3.4	-2.5	-11.0	-28.0	-39.5	-37.9	-46.0
Average Minimum	-35.8	-30.7	-27.9	-15.6	-5.0	2.1	6.1	1.4	-5.6	-13.2	-24.3	-31.0	-14.9
Mean	-19.1	-15.7	-10.0	0.3	8.4	14.4	15.9	12.2	5.8	-1.9	-11.1	-14.2	-1.2
Average Maximum	0.0	0.9	5.1	12.9	22.2	26.9	26.8	25.2	16.9	9.0	1.7	1.4	12.4
Extreme Maximum	4.5	5.1	10.0	19.3	28.7	33.8	29.9	31.2	22.0	18.8	9.9	6.9	33.8

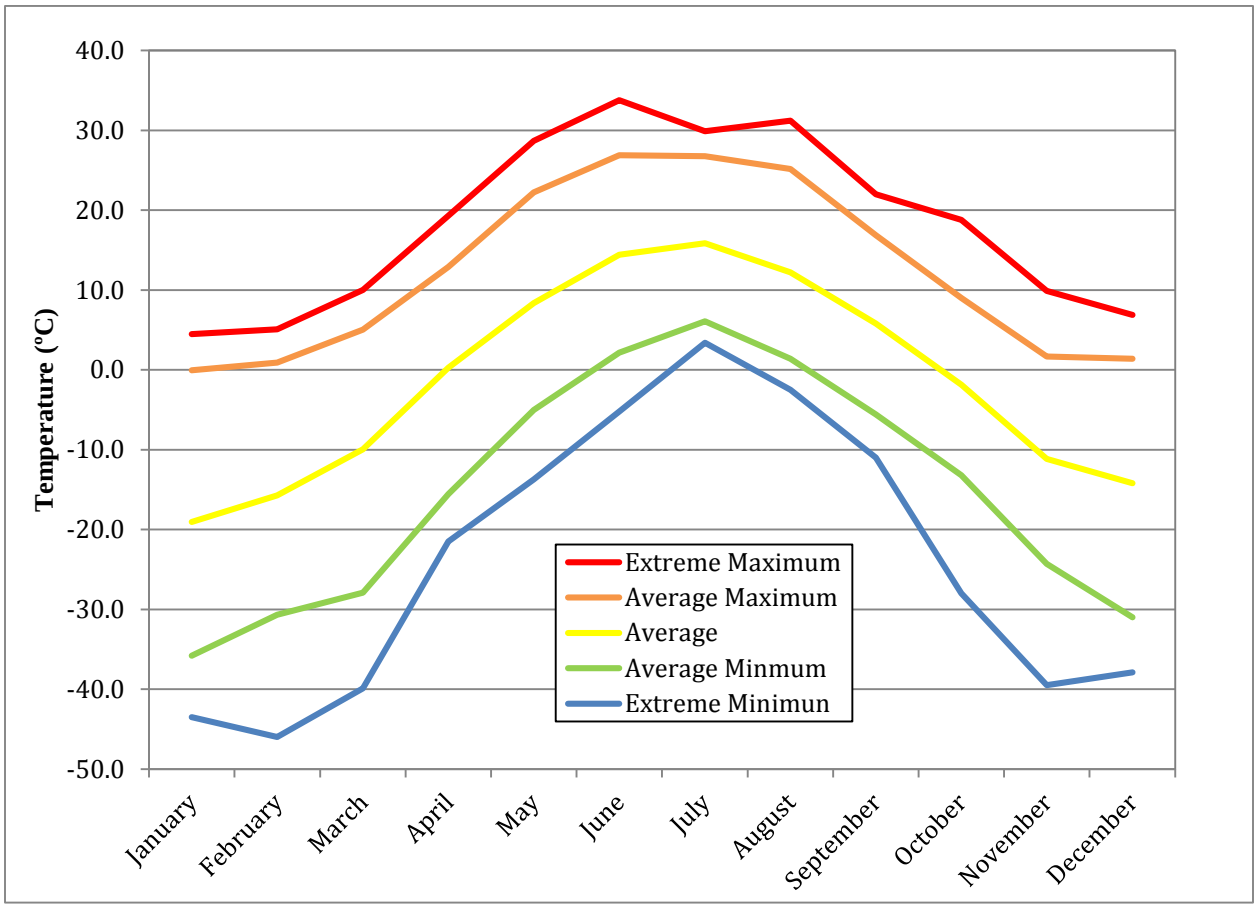


Figure 2 Brewery Creek Air Temperature, 1994-2010

Comparison between 2015 air temperature and historical averages and extremes (January to September only) indicates that 2015 average and extreme monthly maximum temperatures were all cooler than the 1994-2010 average, while the average and extreme monthly minima were much warmer, indicating a reduced annual range. The 2015 mean temperature from January to September was 1.8°C while the mean temperature for the corresponding period from 1994 to 2010 was 1.4 °C. Mean annual temperatures will be compared once data for the rest of the year 2015 are available.

Figure 3 and 4 show the 1991-2010 January and July temperature trends, respectively. The January minimum temperature has been increasing at the most rapid rate (0.47ºC/year), while the January maximum temperature has been decreasing at a rate of 0.55ºC/year. The July minimum, average and maximum temperature have all been increasing. Note that 20 years is a short period for evaluating temperature trends and that more confidence will be gained with a longer data record. For comparison, a longer temperature record is available at Dawson A and January mean, maximum and minimum temperatures show a very slightly decreasing trend over 32 years (1977-2008). July temperatures at Dawson A are available over an even longer period (1976-2012), and while extreme maxima show a slightly decreasing trend, mean monthly temperature and minimum monthly temperatures have been increasing slightly. Figure 5 and Figure 6 show the temperature trends at Dawson A for January and July, respectively.

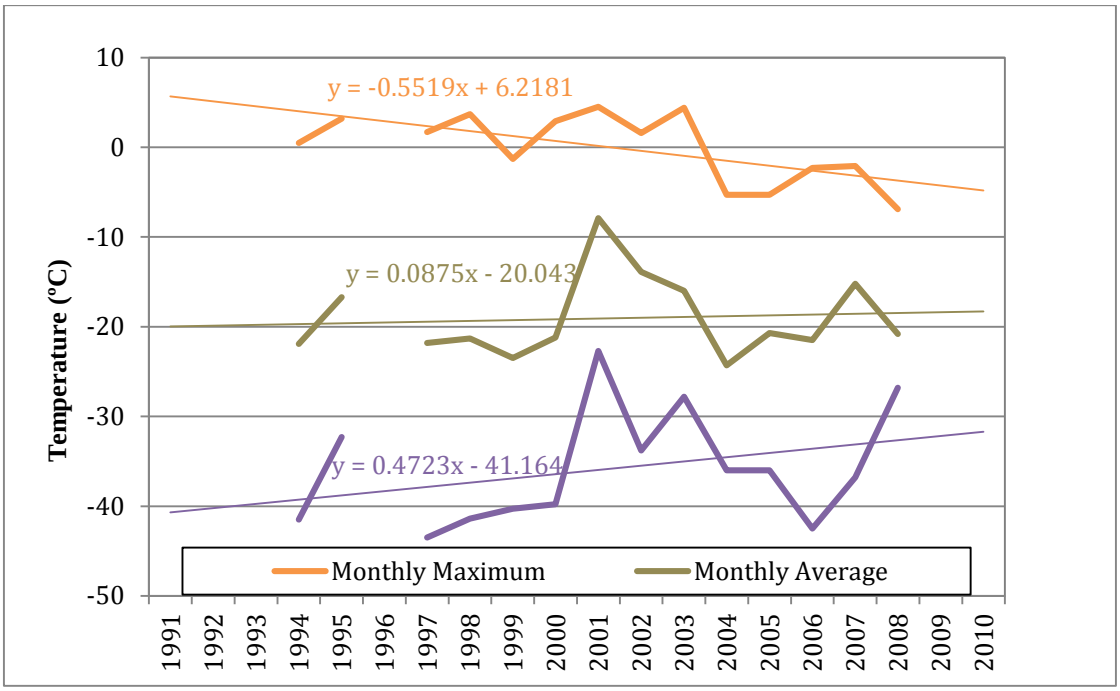


Figure 3 Brewery Creek Average January Temperature Trend

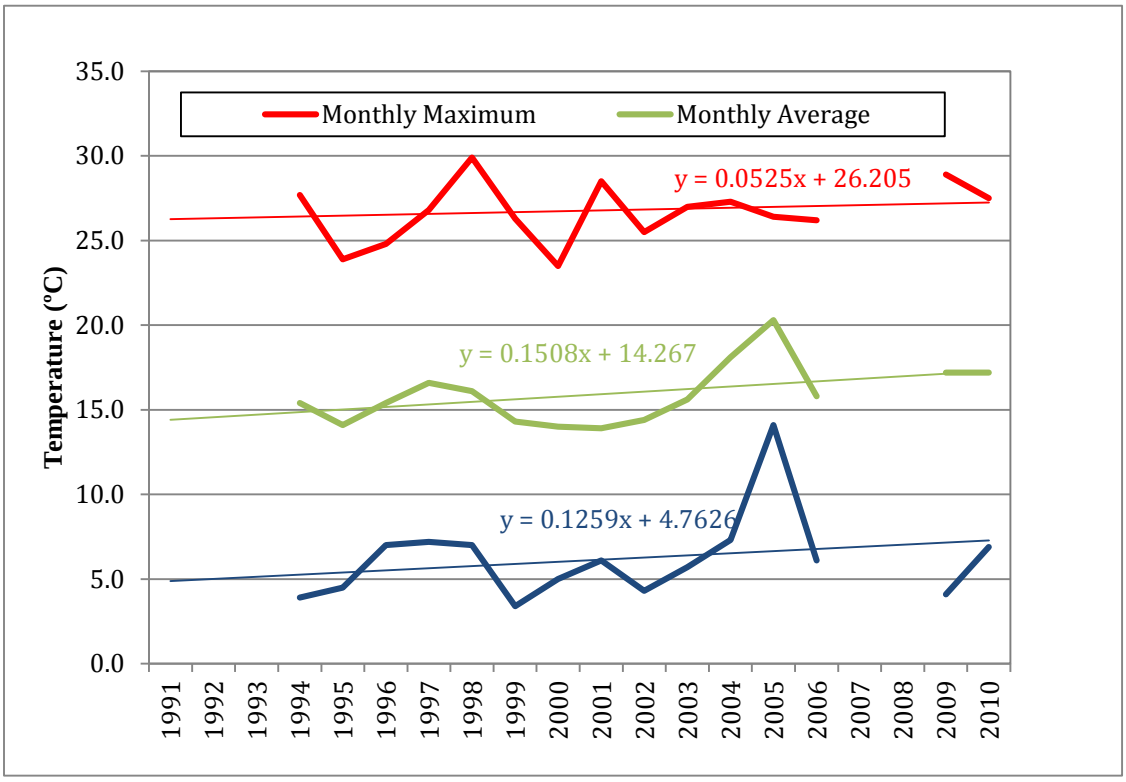


Figure 4 Brewery Creek Average July Temperature Trend

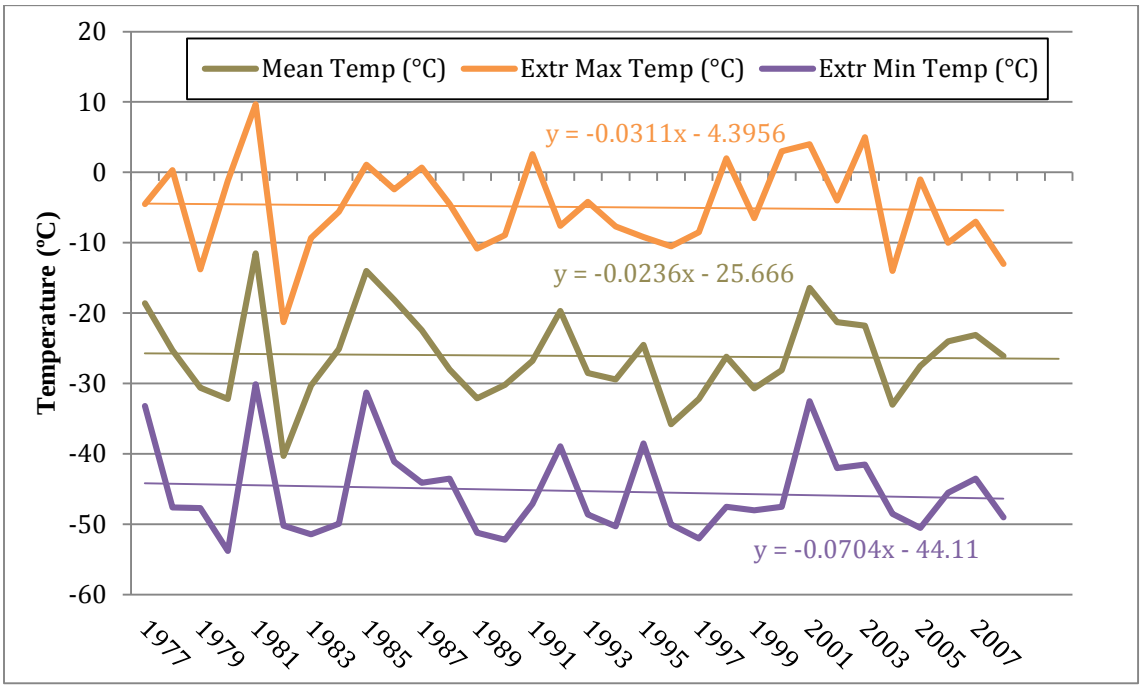


Figure 5 Dawson A January Average Temperature Trend

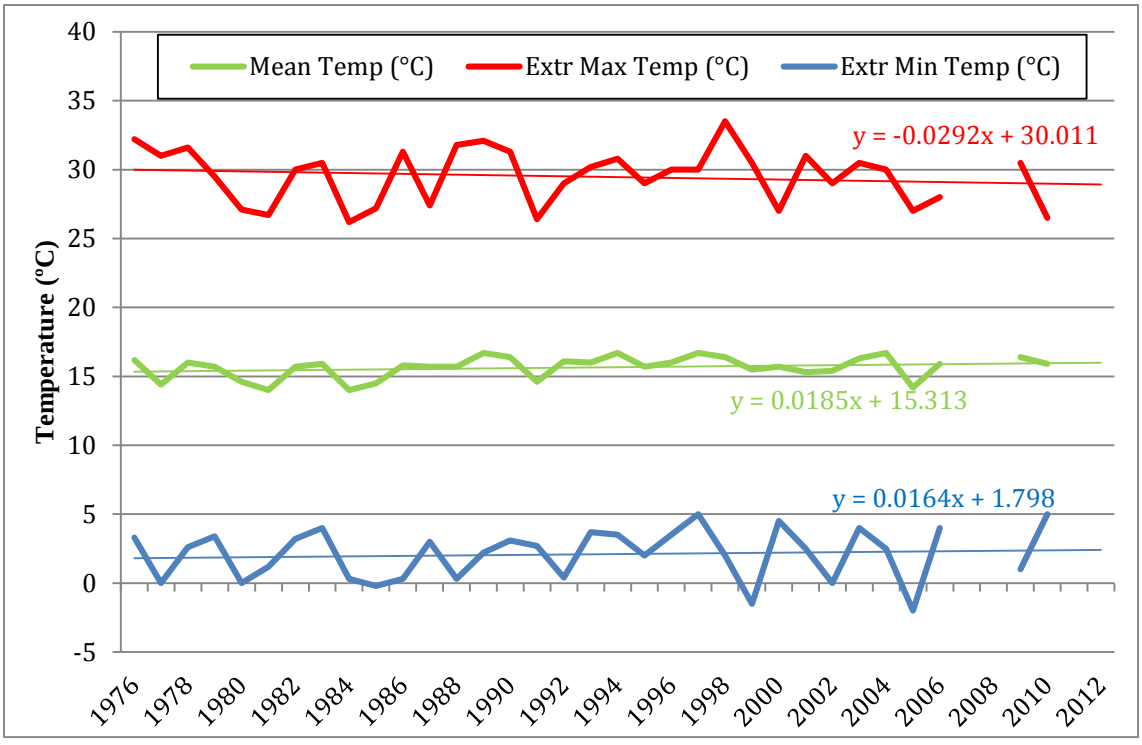
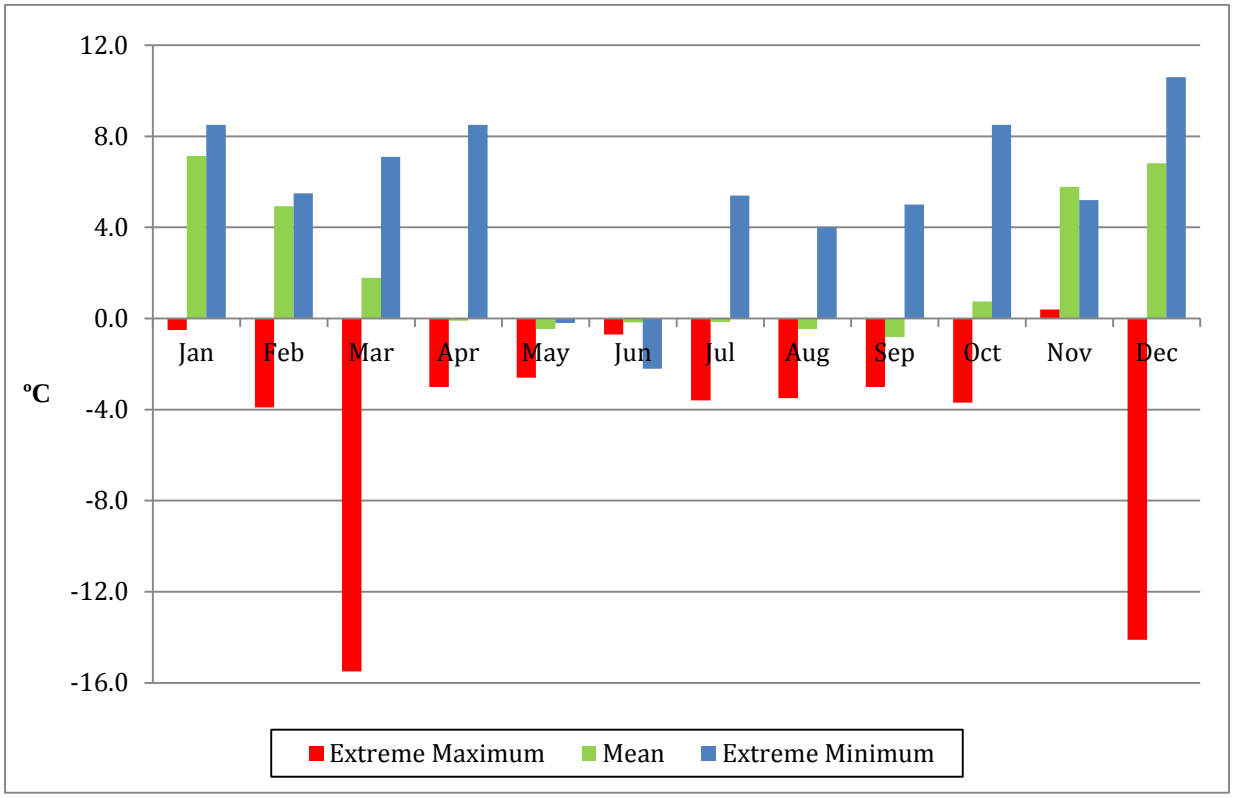


Figure 6 Dawson A July Average Temperature Trend

A comparison of Brewery Creek temperature data with Dawson airport values was last made for the period 1991-2014 and indicated that the annual mean temperature is on average 2.1°C warmer at Brewery creek than in Dawson. The extreme maximum is colder by an average of 4.5°C and the extreme minimum is colder by an average of 5.5°C, indicating a smaller diurnal range at Brewery creek than in Dawson. There are also some seasonal variations in the differences as shown in Figure 7 below.

Figure 7 Monthly Average Temperature Difference between Dawson A and Brewery Creek 1991-2014



**a positive difference indicates that the value is higher at Brewery creek than at Dawson Airport*

5.2. Precipitation

On average Brewery Creek receives about 339.2 mm a year. This figure is computed by finding the average monthly rainfall for each month for which the data set is complete from 1991 to present and summing those figures. From 1981-2010, Dawson, by comparison, had an average precipitation of 324.4mm, a difference of 14.8mm or 4.6% more at Brewery Creek. This more than double the difference found by CCL in their 2000 design memorandum of 1.9% more at Brewery Creek (see Appendix B). The greater precipitation at Brewery Creek is expected given that the site elevation is 468m higher than the Dawson Airport and in the foothills of the Ogilvie mountain range which rises directly north of the site.

Table 3 presents the monthly precipitation data gathered at Brewery Creek from 1991 to 2010. Mean values only take into account complete months and the mean annual value is the sum or monthly means. Figure 8

displays the percent of total annual precipitation which occurs each month at Brewery Creek for these data as well as that for Dawson City according to the 1981-2010 climate normals.

Table 3 Monthly Precipitation Totals (mm) collected at Brewery Creek 1991-2010

	Month												
Year	**Jan**	**Feb**	**Mar**	**Apr**	**May**	**Jun**	**Jul**	**Aug**	**Sep**	**Oct**	**Nov**	**Dec**	**Annual**
1991					11.4	16.7	23.8	94.1	43.7				*189.7*
1992													
1993									18.4	20	35.3	20.3	*94*
1994									42.4	40.4	32.7	14.3	*131.4*
1995	19.8	19.1	10.1	5.5	49.4	39.1	97.9	45.2	64.4	31.3			*381.8*
1996	9.3	10.6	6.5	5.4	20	38.1	11.1	30.7	34.8	11.9	18.3	8.9	205.6
1997	9.5	2.4	4.2	8.3	24.2	62	36.6	52.9	43.3	30.6	13	25.4	312.4
1998	5.9	4.7	1.8	4.8	31.3	36.1	21.9	25.4	17.7	20.6	6.5	7.7	184.4
1999	16	10.1	10.1	18.9	39	40.8	44.3	54.4	7.7	50.2	16	31.9	339.4
2000	29	16	17.1	19.5	48.5	60.3	104	40.2	70.3	17.7	21.9	23	467.5
2001	13.6	18.9	16.5	12.4	30.7	17.7	69.7	36.6	34.9	21.3	17.7	11.8	301.8
2002	21.9	11.2	9.5	28.4	27.8	43.1	49.9	104.6	20.7	28.4	29.5	37.2	412.2
2003	22.5	29.5			36.6	27.8	55	41.4	67.4	20.1	39	32.2	*371.4*
2004	27.9	18.4	17.5	11.9	11.5	19.8	47.6	5.8	27	43	31	37.1	298.5
2005	22.4	33.2	18.9	26	37.9	37.6	38.9	63.7	49.9	13.9	44.5	21.1	408
2006	6.4	20.4	20.3	33	34.7	52.8	20.7	64.6	39.2	29.3	12.3	17.3	351
2007	22.4	38	31.2	9.8	27.9	29.5	30	26.7	38.9	11.6	13.6	15.7	295.3
2008	21.3	30.5	26.3	35	43.6	30.1	55	94.2	52.6	22.9	19.6	20.9	452
2009	14.5	22.9	21.3	22.8	25	31.3	29	37.6	66.8	24.9	15.5	10.5	322.1
2010						41.2	82	39.1	70.5	88			*320.8*
Mean	**17.5**	**19.1**	**13.6**	**15.1**	**28.3**	**35.8**	**48.9**	**47.7**	**42.2**	**28.6**	**22.1**	**20.3**	**339.1**

Note: Values in grey are incomplete data and are excluded from calculation of the mean

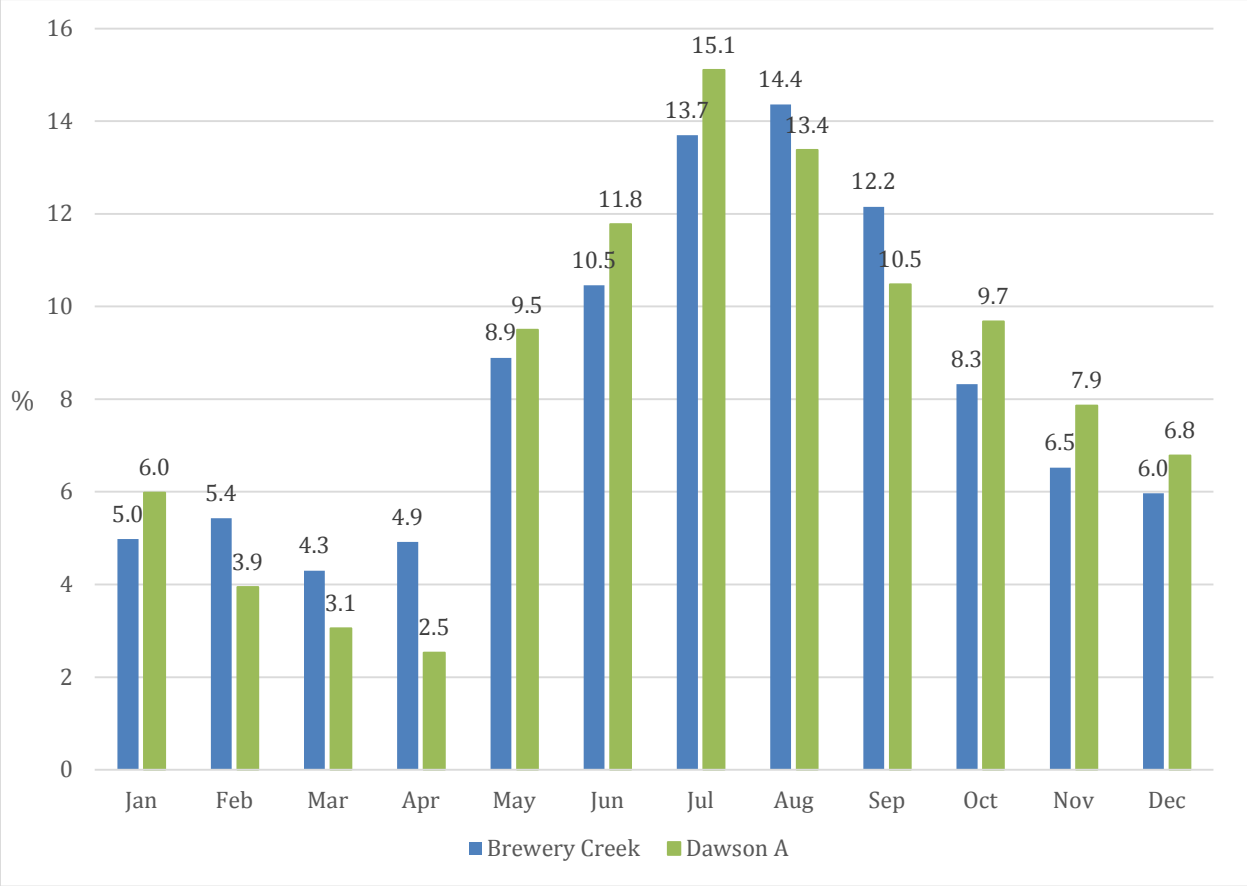


Figure 8 Percent of total annual rainfall occurring during each calendar month for Brewery Creek 1991-2010 period and Dawson 1981-2010 Climate Normals

The years 2012, 2013, 2014 and 2015 have incomplete or potentially inaccurate precipitation data, therefore annual totals cannot be compared directly with historical values. However the precipitation totals for the summer period (June to September inclusively) are complete and can be compared. The total summer precipitation for the period 1991-2010 averages 177.9mm. In 2012, the summer total was 145.3mm (18.3% less than the historical average). In 2013 the summer total was 51.4mm but it is suspected that June and July precipitations were under recorded, and comparison with the historical average is not meaningful. In 2014, the summer total was 142.2mm (20.1% less than the historical average) and in 2015 it was 162.9mm (8.4% less than the historical average).

5.3. Snowpack

Snow pack observations have occurred at Brewery Creek since 1995 and at the Midnight Dome snow course since 1975. Snow falls in the region mainly from October to April though some precipitation may fall as snow in May, September and even August. Peak snow pack usually occurs from late March to early April, but can occur early or later at both sites. Both sites are similar in elevation (Midnight Dome being 18m higher), but are about 55kms apart. As can be seen in Table 4 the majority of annual precipitation falls in the summer months

as rain, but the peak SWE is usually much more than the greatest monthly total precipitation of any month and therefore snowmelt is the main contributor of peak stream discharge.

No survey data were found for 2005. In 2006, a different set of survey sites were implemented. These data were gathered by the caretaker and consist of sites on the leach pad and the blue dump. No distinction is made between top and sides of leach pad and relative area as in the years prior. No data were found for 2011, and no snow surveys were carried out in 2014 or 2015. Equal weight is given to each site in computing the average. Table 4 summarizes all snowpack data gathered at Brewery Creek to date and corresponding years at Midnight Dome, while Table 5 presents the averages for those data.

The following observations can be made about the snow pack at Brewery Creek and Midnight Dome:

- The snowpack on and around the leach pads is usually completely melted by the end of April but persists longer in the forest and at Midnight Dome;
- At or close to peak snow pack (April 1st), Brewery Creek snow pack tends to be about 75% of Midnight Dome snow water equivalent (SWE) on Natural Ground and 77% within the leach pad area;
- The average peak snowpack on the leach pad (114.6mm) is similar to that on natural ground (111.1mm) while the blue dump is highest (129.1mm);
- Measurements on leach pad area show a high degree of variability reflecting wind effects and drifting in specific low area and at the bottom of slopes with less snow on the crests and flat top area;
- And from CCL (2000) "areas under active leach during the winter appear to experience lower maximum snowpack than areas not under active leaching, possibly due to some melting of snow during the winter over the actively leaching areas".

Table 4 Snowpack Survey Data, Snow Water Equivalent (mm) – Brewery Creek and Midnight Dome

Year	Station	Comment	Elev (m)	Note	Jan-01	Feb-01	Mar-01	Apr-01	May-01
1995	Brewery Creek	Natural Ground	775-830	1		78.5	87.6		
	Midnight Dome	DIAND natural ground	855	2			150	170	123
1996	Brewery Creek	Natural Ground	760-780	3		78.4		92.4	
	Midnight Dome	DIAND natural ground	855	2			91	109	101
1997	Brewery Creek	Natural Ground	740-850	4	90.3	102.3	104.3	107.6	
	Brewery Creek	Within leach pad area		5	94.6	69.1	97.5	105.4	
	Brewery Creek	All Data	740-850	6	80.7	87.7	96.8	102.8	
	Midnight Dome	DIAND natural ground	855	2			146	161	117
1998	Brewery Creek	Natural Ground	740-850	4	36.5	62.5	72.5	97.9	
	Brewery Creek	Leach pad slopes cells 1,2,4	800-820	7	71.9	54.3	74.2	28.9	

Year	Station	Comment	Elev (m)	Note	Jan-01	Feb-01	Mar-01	Apr-01	May-01
	Brewery Creek	Leach pad slopes cell 5	810-830	7	27.3	52.2	41.2	85.4	
	Brewery Creek	Leach pad top cells 3 & 4	820-840	7	34.2	24.3	39.6	9.2	
	Brewery Creek	Leach Pad weighted average	800-840	8	36.7	31.2	43.1	22.2	
	Brewery Creek	All Data	740-850	6	39.2	51.9	61.9	69.1	
	Midnight Dome	DIAND natural ground	855	2			129	119	92
1999	Brewery Creek	Natural Ground	740-850		40.6	41.8	80.4	86.9	
	Brewery Creek	Leach Pad Top (837 lift)	837	9	39.7	46.1	41		
	Brewery Creek	Leach Pad Slopes (cells1,2,5)	800-830	9	46.1	43	64	84.4	
	Brewery Creek	Leach Pad weighted average	800-840	9	42	45	49.3		
	Brewery Creek	All Data	740-850	6	42.7	42.9	66.2	88.6	
	Midnight Dome	DIAND natural ground	855	2			84	90	92
2000	Brewery Creek	Natural Ground	740-850	10	64.9	85.5	146		
	Brewery Creek	Leach Pad Top (830 lift)	830	9	12.1	46.7	54.5		
	Brewery Creek	Leach Pad Slopes (cells1,7)	800-830	9	141.6	181.2	135.4		
	Brewery Creek	Leach Pad weighted average	800-840	9	56.4	95.1	83.624		
	Brewery Creek	All Data	740-850	6	46.6	75.8	96.2	94.5	
	Midnight Dome	DIAND natural ground	855	2			187	197	195
2001	Brewery Creek	Natural Ground	740-850	11	53.9	74		83.7	
	Brewery Creek	Leach Pad Top (830 lift)	830	9		91.4		71.3	
	Brewery Creek	Leach Pad Slopes (cells1,7)	800-830	9		102.1		95.8	
	Brewery Creek	Leach Pad weighted average	800-840	9		95.3		80.1	
	Brewery Creek	All Data	740-850	18	50.7	82.2		79.7	
	Midnight Dome	DIAND natural ground	855	2			140	154	172
2002	Brewery Creek	Natural Ground	740-850	12	43.3	57.5	75.1	78	
	Brewery Creek	Leach Pad Top (830 lift)	830	9	34.9	60.3	88.1	78.6	
	Brewery Creek	Leach Pad Slopes (cells1,7)	800-830	9	41.8	60.9	83.1	77.1	
	Brewery Creek	Leach Pad weighted average	800-840	9	37.4	60.5	86.3	78.1	

Year	Station	Comment	Elev (m)	Note	Jan-01	Feb-01	Mar-01	Apr-01	May-01
	Brewery Creek	All Data	740-850	18	37.9	58.4	80	77.5	
	Midnight Dome	DIAND natural ground	855	2			93	105	75
2003	Brewery Creek	Natural Ground	740-850	13				80.1	
	Brewery Creek	Leach Pad Top (830 lift)	830	9				79	
		Leach Pad Slopes (cells1,7)	800-830	9				133.9	
		Leach Pad weighted average	800-840	9				98.8	
	Brewery Creek	All Data	740-850	18				84.2	
	Midnight Dome	DIAND natural ground	855	2			102	98	44
2004	Brewery Creek	Natural Ground	740-850	14		150.5	143.6		
	Brewery Creek	Leach Pad Top (830 lift)	830	9		144.7	139.6		
	Brewery Creek	Leach Pad Slopes (cells1,7)	800-830	9		177.5	192.7		
	Brewery Creek	Leach Pad weighted average	800-840	9		156.5	158.7		
	Brewery Creek	Blue Dump	750-850	15			132.7		
	Brewery Creek	All Data	740-850	18		153.5	144.7		
	Midnight Dome	YE natural ground	855	16			153	190	167
2005	Midnight Dome	YE natural ground	855	16			196	199	197
2006	Brewery Creek	Blue Dump	750-850	15		59.2			
	Brewery Creek	Leach Pad	800-840	17		62.2			
	Brewery Creek	All Data	750-850	18		60.9			
	Midnight Dome	YE natural ground	855	16			120	121	162
2007	Brewery Creek	Blue Dump	750-850	15				99.9	
	Brewery Creek	Leach Pad	800-840	17				105.2	
	Brewery Creek	All Data	750-850	18				102.8	
	Midnight Dome	YE natural ground	855	16			114	145	145
2008	Brewery Creek	Blue Dump	750-850	15			51.1		
	Brewery Creek	Leach Pad	800-840	17			85.9		
	Brewery Creek	All Data	750-850	18			70.7		
	Midnight Dome	YE natural ground	855	16			83	103	147
2009	Brewery Creek	Blue Dump	750-850	15				160.1	
	Brewery Creek	Leach Pad	800-840	17				171.7	
	Brewery Creek	All Data	750-850	18				166.4	
	Midnight Dome	YE natural ground	855	16			127	172	182
2010	Brewery Creek	Blue Dump	750-850	15				74	
	Brewery Creek	Leach Pad	800-840	17				109.2	
	Brewery Creek	All Data	750-850	18				93.2	

Year	Station	Comment	Elev (m)	Note	Jan-01	Feb-01	Mar-01	Apr-01	May-01
	Midnight Dome	YE natural ground	855	16			110	160	98
2011	Midnight Dome	YE natural ground	855	16			152	195	174
2012	Brewery Creek	Blue Dump	750-850	15			81.3	198	
	Brewery Creek	Leach Pad	800-840	17			136.3	261	
	Brewery Creek	Natural Ground	740-850	19			170.2	213.1	124
	Brewery Creek	All Data		18			176.4	222.2	
	Midnight Dome	YE natural ground	855	16			153	184	188
2013	Brewery Creek	Blue Dump	750-850	15				113.5	
	Brewery Creek	Leach Pad	800-840	17				118.5	
	Brewery Creek	Natural Ground	740-850	19				141.6	
	Brewery Creek	All Data		18				128.1	
	Midnight Dome	YE natural ground	855	16			192	239	253
2014	Midnight Dome	YE natural ground	855	16			114	162	0
2015	Midnight Dome	YE natural ground	855	16			154	181	160

Table 5 Mean snowpack values for period of record, 1995-2015

Years	Station	Comment	Elev	Note(s)	Jan-01	Feb-01	Mar-01	Apr-01	May-01
1995-2015	Brewery Creek	Natural Ground	740-850		54.9	81.6	110.0	111.1	
	Brewery Creek	Within leach pad area	800-840		53.4	79.0	92.6	114.6	
	Brewery Creek	Blue Dump	750-850			59.2	88.4	129.1	
	Brewery Creek	All Data	740-850		49.6	77.0	97.8	107.8	
	Midnight Dome	Common years with BCM	855				130.9	148	
	Midnight Dome	All years 1995-2015	855				131.9	153.0	135.5
1975-2015	Midnight Dome	All available years				98	133	152	128
Midnight Dome – Average (1995-2015) / (1975-2015)							99.17%	100.63%	105.86%
1995-2013	**Ratios of (Brewery Creek to Midnight Dome)**								
	Natural Ground						84.01%	75.08%	
	Within leach pad area						70.74%	77.45%	
	All Data						74.75%	72.84%	

Notes for Table 4 and Table 5:

1) 1995 BCM data includes sites at Canadian Zone, within leach pad and outside leach pad. No ore in place on heap. Averages for all sample points.

2) All Midnight Dome data reported by DIAND Water Resources. Feb. 1 data not collected since 1985

3) 1996 BCM data includes sites within and outside leach pad area. No ore on heap. Averages for all sample points.
4) 1997 and 1998 BCM data for "Natural Ground" include six locations surrounding leach pad.
5) 1997 BCM data "Within leach pad area" is area-weighted average, 6 to 9 sites per month covering active & inactive leaching areas. Total 1.9 Mt ore, 0.5 Mt under leach.
6) 1997 to 2000 BCM "All Data" reflects average of all individual sample points for all locations.
7) 1998 BCM data "Leach pad slopes cells 1, 2, 4" represents approx. 20,000 m2 area on pad; "Leach pad slopes cell 5" represents approx. 31,000 m2: and, "Leach pad top cells 3 & 4" represents approx. 161,000 m2 on pad. Areas estimated by BCM personnel in the field. Total 3.9 Mt ore with 1.1 Mt under leach.
8) 1998-2004 BCM data "Leach pad weighted average" represents average SWE for entire leach pad area based on relative areas and SWE's.
9) For 1999 - 2004, "Leach Pad Top" estimated by BCM personnel as 64% of total area, "Leach Pad Slopes" equal to 36% of total area to estimate "Leach Pad Weighted Average" snow water equivalents (SWE).
10) Brewery Creek data shown for Jan 1, 2000 collected on Jan 14, 2000.
11) Brewery Creek data shown for Jan 1, Feb 1 and Apr 1, 2001 collected on Jan 8, Feb 7 and Mar 23, 2001, respectively.
12) Sample dates were mid-month Dec-Mar in 2002 so values are linearly interpolated for all Brewery Creek sites.
13) Brewery Creek Data collected Mar 23, 2003.
14) Actual sample dates are Jan 30 and Feb 28, 2004.
15) Snow surveys began on blue waste rock dump in 2004, means are not area weighted.
16) Water Resources came under the jurisdiction of Yukon Environment after 2003
17) For 2006-2013, leach pad averages are not area weighted.
18) For 2000-2013 all sites are given equal weight in average calculation.
19) Starting in 2012, the natural ground survey is a new network of sample sights near water quality stations.
20) Midnight Dome monthly snow averages provided be Environment Yukon (Environment Yukon, 2012)

5.4. Evaporation and Evapotranspiration

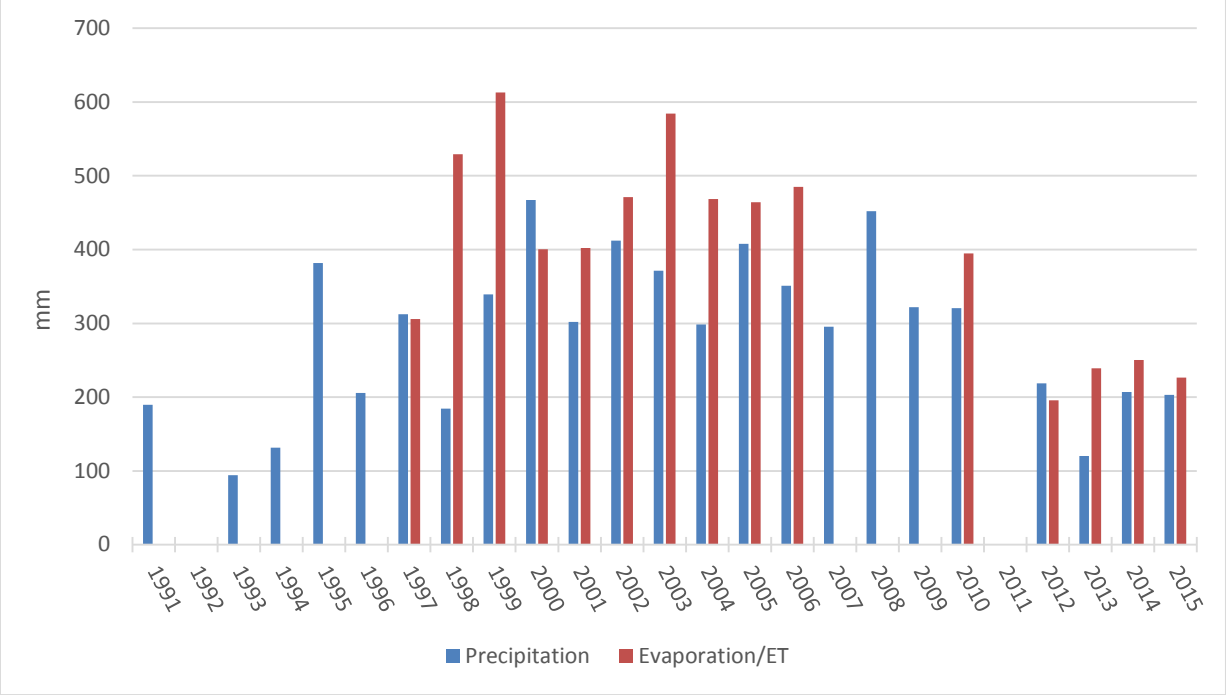
The Campbell Scientific datalogger includes an evapotranspiration (ET) instruction, which uses temperature, relative humidity, wind speed, solar radiation, latitude, longitude and altitude to calculate an evaporation rate for a short grass crop, as recommended by Campbell Scientific. This is only an approximation of actual evaporation at site, which varies locally depending on surface type and micro topography. Note that if one of the parameters listed above is invalid, the ET calculation also has to be invalidated. Results were presented in Table 1 (no ET results are available prior to April 2012 due to invalid relative humidity readings).

Between 1997 and 2006, an evaporation pan was established between the overflow and intermediate ponds. Table 6 and Figure 9 below show the annual precipitation and evaporation at Brewery creek recorded between 1991 and 2014. Values shown in italics were compiled using partial data and therefore underestimate total annual precipitation or evaporation. Lake evaporation is calculated using a pan coefficient of 0.70.

Table 6 Brewery Creek Annual Precipitation and Evaporation

Year	Precipitation (mm)	Pan Evaporation (mm)	Calculated Lake Evaporation (mm)	Calculated ET (mm)
1991	*189.7*			
1992				
1993	*94.0*			
1994	131.4			
1995	*381.8*			
1996	205.6			
1997	312.4	*306*		
1998	184.4	*529.4*		
1999	339.2	612.8	429	
2000	467.4	400.5	280.4	
2001	301.9	402.4	281.7	
2002	412.2	471.1	329.8	
2003	*371.4*	584.2	408.9	
2004	298.5	468.5	328	
2005	408.0	464	342.8	
2006	351.0	485	339.5	
2007	295.3			
2008	452			
2009	322			
2010	*320.8*	*394.8*		
2011				
2012	*218.7*			*195.8*
2013	*120.1*			*239.2*
2014	*207.1*			*250.3*
2015	*203.0*			*226.6*

Figure 9 Total Annual Precipitation and Evaporation/ET at Brewery Creek 1991-2015



Total evapotranspiration (ET) for the summer period (June to Sept. inclusively) was 136.2 mm in 2012, 153.3 mm in 2013, 135.7 mm in 2014 and 109.7 mm in 2015. Evapotranspiration is the evaporation from the ground surface and transpiration from vegetation and it used for the total catchment water balance. Evapotranspiration was not calculated prior to 2012 as only evaporation from the surface of the ponds was of concern for water balance purposes. An evaporation pan was not installed in 2011 with the new meteorological station.

From, 1991-2010 average total potential evaporation (TPE) was 404.5mm and average lake evaporation (LE = TPE x 0.70) was calculated at 340.2mm. Evaporation pans are considered a measure of total potential evaporation. CCL (2000) recommended adopting a conservative estimate of 390-400mm for water balance purposes. The data collected from 1991-2010 suggest that on average lake evaporation may be even lower than the CCL (2000) estimate.

5.5. Wind

Wind speed and direction are measured at a height of 10m at the Campbell Scientific meteorological station. Wind data collected since November 2011 are presented in the wind rose below (Figure 10). The wind sensor experienced occasional icing during the winter months and extended periods of zero wind speed were invalidated. Also note that winter wind speeds may occasionally be underestimated due to the presence of ice on the sensor, but these occurrences cannot be detected in the data record. From this wind rose, it can be seen

that prevailing winds blow from the southwest and that the highest average wind speeds also originate from this direction. Summary statistics are presented in Table 7 below.

Table 7 Brewery Creek Wind Rose Summary Statistics

Total Number of Hours	31078
Average Wind Speed	2.62 m/s
Calm Records	3073
Calm Winds Frequency	9.89 %
Data Availability*	95.11 %
Incomplete/Missing Records	1521
Total Records Used	29557

**Excludes periods when the station was down*

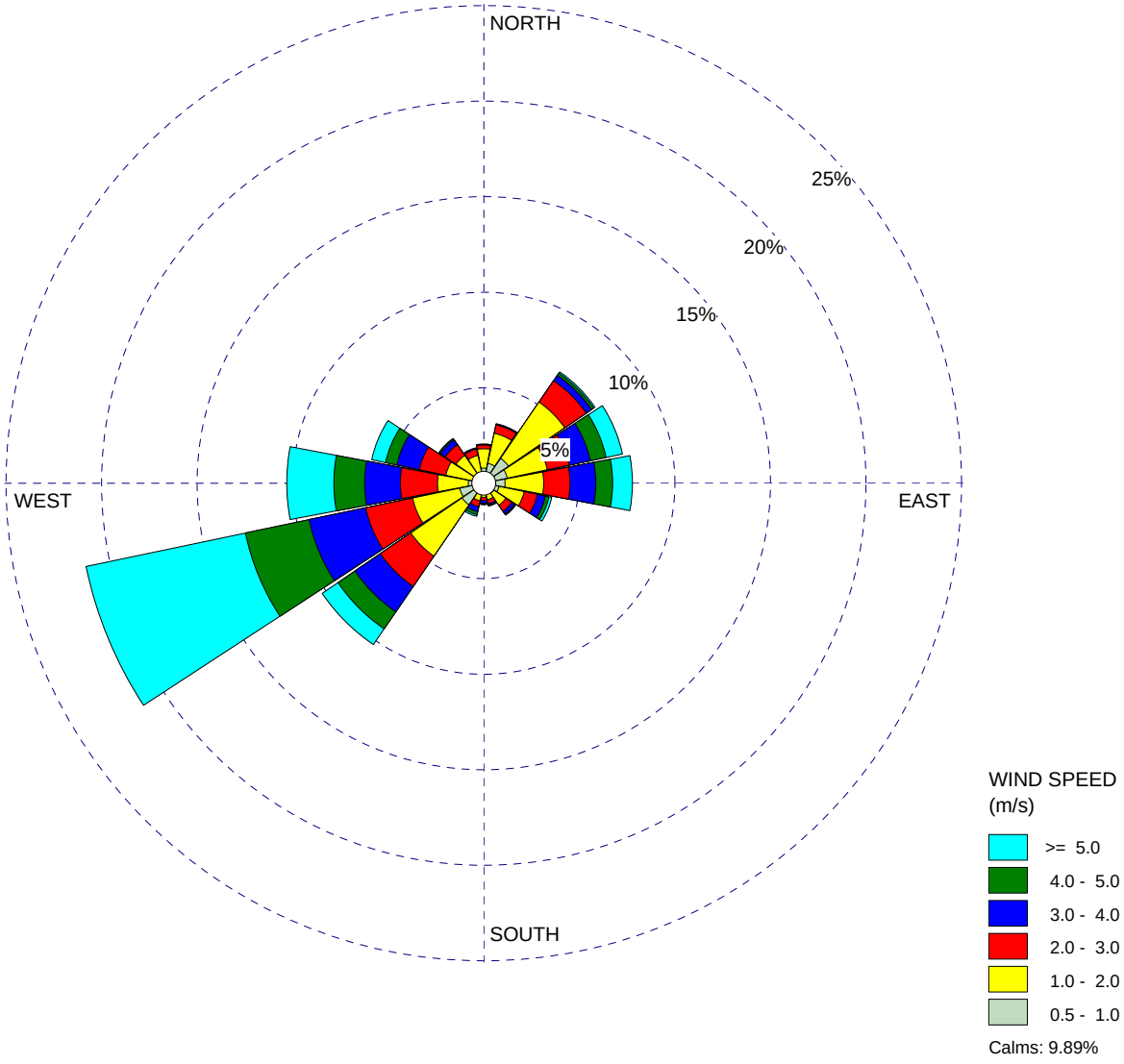
No wind data were collected at Brewery Creek prior to the installation of the Campbell Scientific meteorological station in 2011, and no comparison can therefore be made with historical data. Also, because wind is highly influenced by local topographical features, comparison with Dawson wind data is not meaningful.

WIND ROSE PLOT:

Figure 10 - Brewery Creek Wind Rose
June 2011 - September 2015

DISPLAY:

Wind Speed
Direction (blowing from)



COMMENTS: Excludes periods of ice affected or missing data. Anemometer height: 10m	DATA PERIOD: **Start Date: 09/11/2011 - 00:00** **End Date: 01/10/2015 - 10:00**	COMPANY NAME:	
		MODELER:	
	CALM WINDS: **9.89%**	TOTAL COUNT: **29557 hrs.**	
	AVG. WIND SPEED: **2.62 m/s**	DATE: **25/02/2016**	PROJECT NO.:

6. REFERENCES

Clearwater Consultants Ltd. 2000. Design Memorandum CCL-BCM3, November 8, 2012.

Environment Yukon 2015 Yukon Snow Survey Bulletin & Water Supply Forecasts, May 1, 2015

Environment Yukon 2015 Yukon Snow Survey Bulletin & Water Supply Forecasts, April 1, 2015

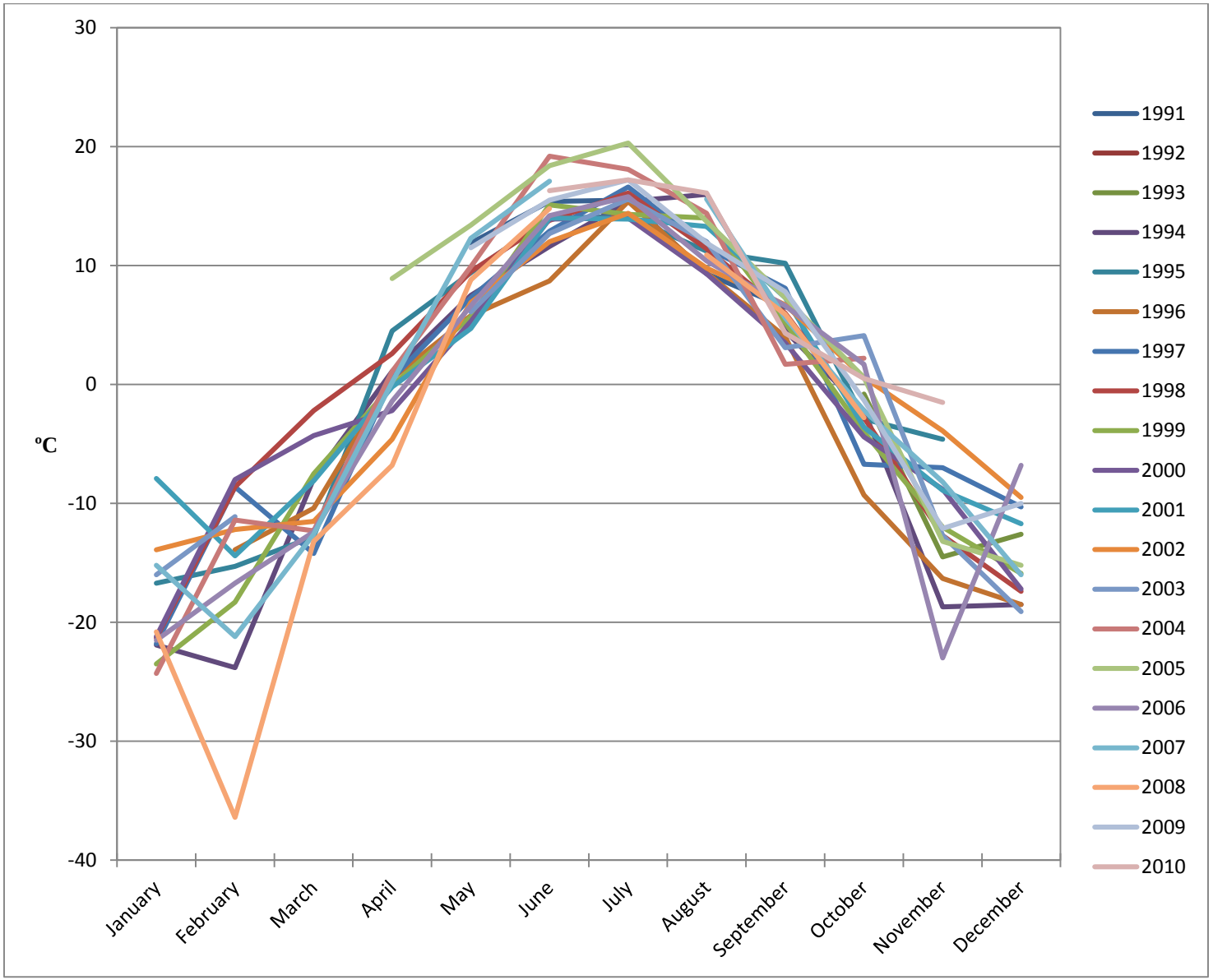
Environment Yukon 2015 Yukon Snow Survey Bulletin & Water Supply Forecasts, March 1, 2015

APPENDIX A

1994-2010 TEMPERATURE DATA GRAPHS

Brewery Creek Monthly Mean Temperature 1991-2010

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann.
1991					11.9	15.4	15.5	9.3	6.5				
1992													
1993										-0.8	-14.5	-12.6	
1994	-21.9	-23.8	-7.9	1.1	7.5	11.6	15.4	16.0	4.5	-2.2	-18.7	-18.5	-3.1
1995	-16.7	-15.3	-12.8	4.5	9.4	14.0	14.1	11.2	10.2	-2.9	-4.6		
1996		-13.9	-10.4	0.5	5.8	8.7	15.4	9.4	4.0	-9.3	-16.3	-18.5	
1997	-21.8	-8.6	-14.2	0.5	7.3	12.9	16.6	11.5	8.1	-6.7	-7.0	-10.3	-1.0
1998	-21.3	-8.6	-2.2	2.6	9.5	13.8	16.1	11.4	6.0	-2.8	-12.7	-17.4	-0.5
1999	-23.5	-18.3	-7.5	-0.1	5.7	15.1	14.3	14.0	5.2	-4.0	-12.0	-15.9	-2.3
2000	-21.2	-8.0	-4.3	-2.2	5.3	13.9	14.0	9.3	3.5	-4.4	-8.8	-17.2	-1.7
2001	-7.9	-14.4	-8.1	-0.2	4.7	14.0	13.9	13.3	7.3	-3.6	-8.9	-11.7	-0.1
2002	-13.9	-12.2	-11.5	-4.6	6.9	12.0	14.4	9.8	6.7	0.6	-3.9	-9.5	-0.4
2003	-16.0	-11.1			6.1	12.7	15.6	12.0	3.1	4.1	-12.7	-19.1	-0.5
2004	-24.3	-11.4	-12.3	1.1	9.9	19.2	18.1	14.4	1.7	2.2			1.9
2005	-20.7			8.9	13.4	18.4	20.3	13.7	7.3	0.6	-13.2	-15.2	3.3
2006	-21.5	-16.7	-12.4	-1.4	6.6	14.2	15.8	10.4	6.6	1.7	-23.0	-6.8	-2.2
2007	-15.2	-21.2	-12.6	0.2	12.3	17.1		15.6	5.6	-2.2	-8.2	-16	-2.2
2008	-20.8	-36.4	-13.2	-6.8	8.8	14.8		10.9	5.9	-2.8			-4.4
2009					11.5	15.5	17.2	11.9	7.8	-1.3	-12.1	-10	5.1
2010						16.3	17.2	16.1	4.3	0.5	-1.5		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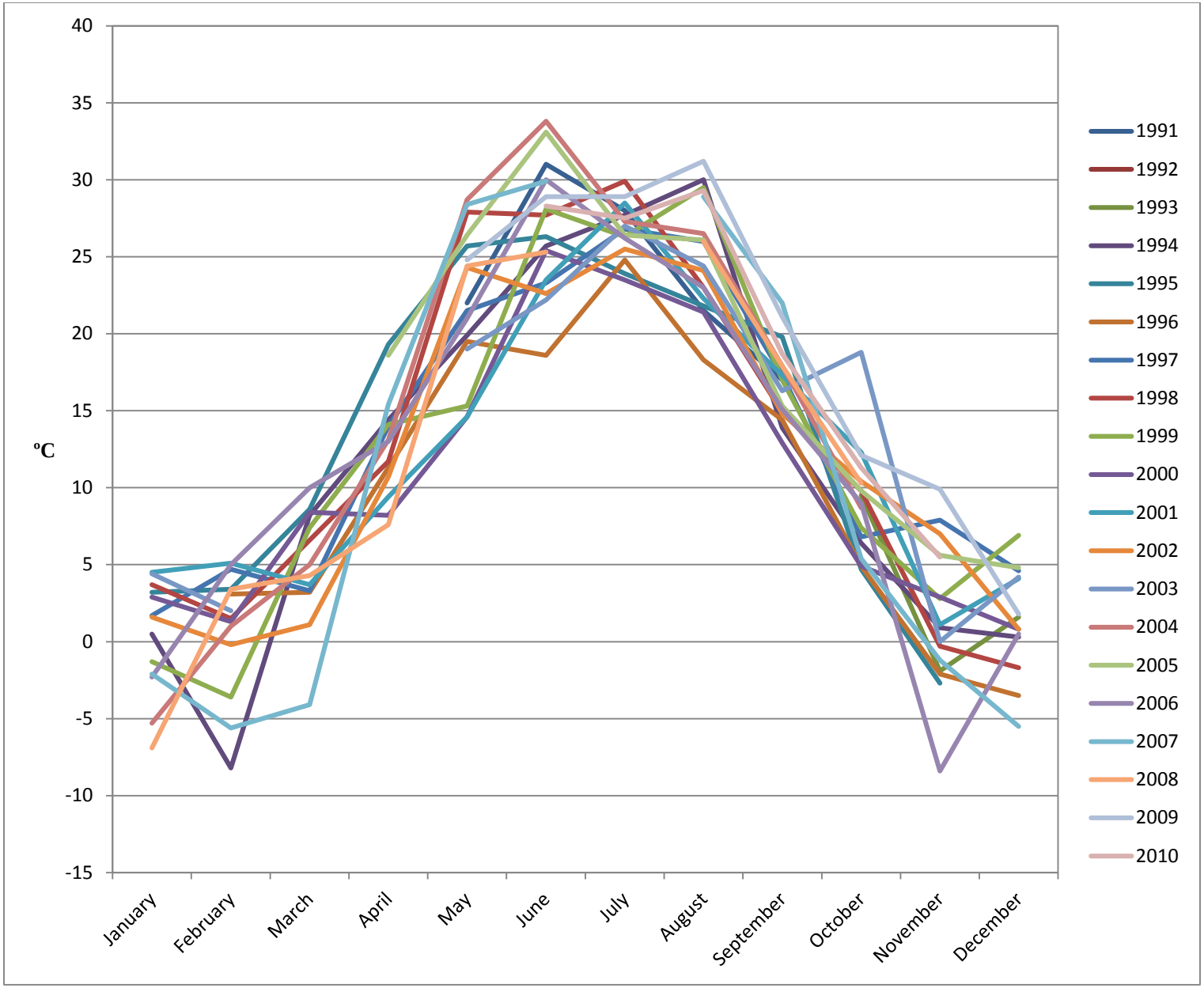
Brewery Creek Monthly Maximum Temperature 1991-2010

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann.
1991					22.0	31.0	28.0	21.5	17.0				31.0
1992													
1993										9.5	-1.9	1.6	
1994	0.5	-8.2	8.2	14.4	19.9	25.7	27.7	30.0	13.9	6.4	0.9	0.3	30.0
1995	3.2	3.4	8.6	19.3	25.7	26.3	23.9	21.8	19.8	4.7	-2.7		26.3
1996		3.1	3.2	11.3	19.5	18.6	24.8	18.3	14.4	4.9	-2.1	-3.5	24.8
1997	1.7	4.7	3.3	14.0	21.5	23.3	26.8	26.0	17.3	6.8	7.9	4.6	26.8
1998	3.7	1.5	6.6	11.7	27.9	27.7	29.9	23.0	14.9	9.8	-0.3	-1.7	29.9
1999	-1.3	-3.6	7.4	14.1	15.3	28.1	26.3	29.5	17.0	7.4	2.8	6.9	29.5
2000	2.9	1.3	8.4	8.2	14.6	25.4	23.5	21.4	12.9	4.9	2.9	0.8	25.4
2001	4.5	5.1	3.7	9.4	14.6	23.5	28.5	22.3	17.3	12.3	1.1	4.1	28.5
2002	1.6	-0.2	1.1	10.7	24.3	22.6	25.5	24.1	14.8	10.4	7.0	0.8	25.5
2003	4.4	2.0			19.0	22.2	27.0	24.4	16.3	18.8	0.0	4.2	27.0
2004	-5.3	1.0	5.0	13.1	28.7	33.8	27.3	26.5	17.9	8.7			33.8
2005	-5.3			18.6	26.4	33.1	26.4	26.1	15.3	9.8	5.6	4.8	33.1
2006	-2.3	5.0	10.0	13.0	21.0	30.0	26.2	23.0	15.1	9.0	-8.4	0.5	30.0
2007	-2.1	-5.6	-4.1	15.4	28.4	29.9		28.9	22	5.4	-1.2	-5.5	29.9
2008	-6.9	3.4	4.3	7.6	24.4	25.3		26.0	17.9	10.3			26.0
2009					24.8	28.9	28.9	31.2	21.1	12.1	9.9	1.8	31.2
2010						28.3	27.5	29.3	18.7	11.3	5.5		29.3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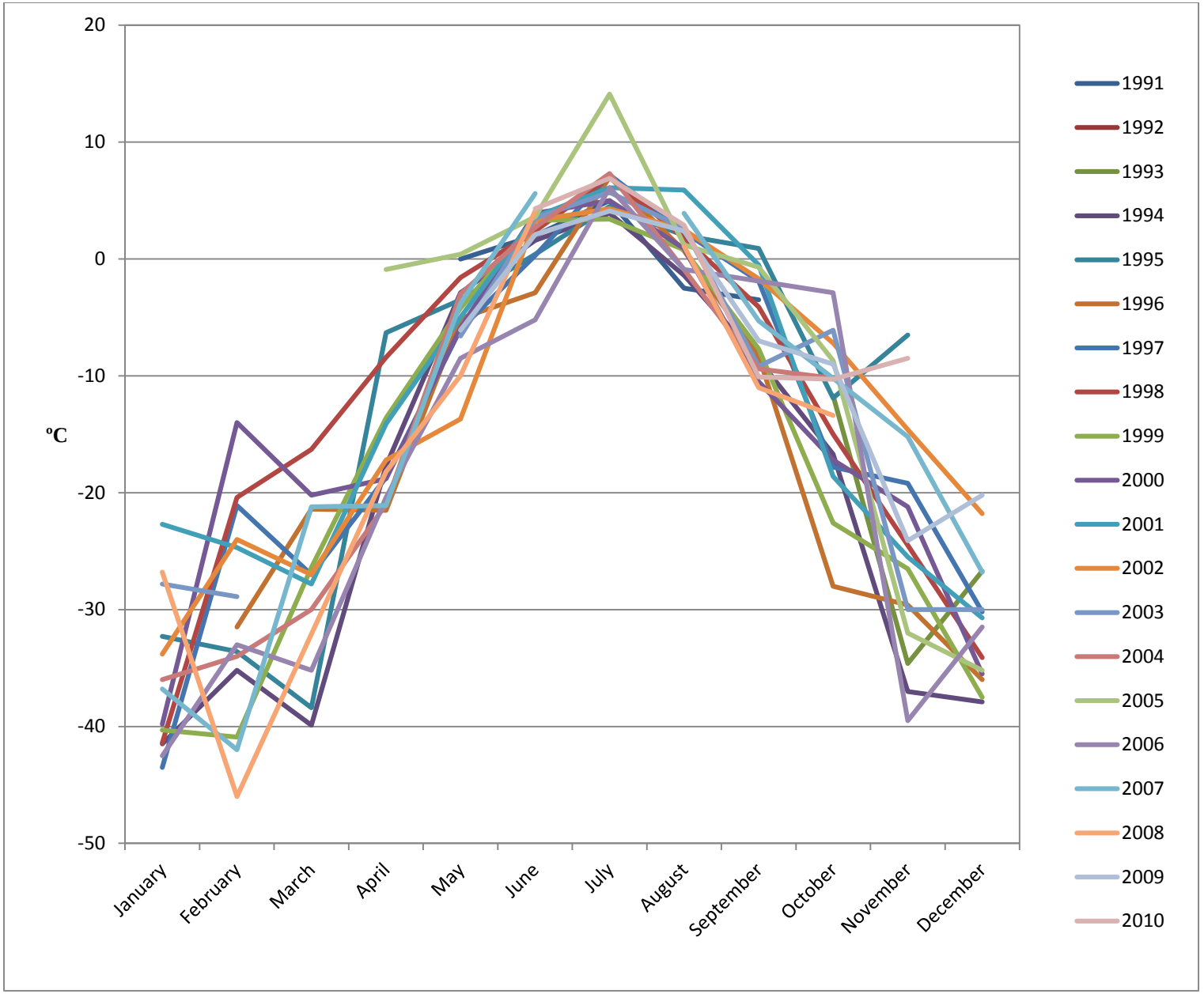
Brewery Creek Monthly Minimum Temperature 1991-2010

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann.
1991					0.0	2.0	5.0	-2.5	-3.5				
1992													
1993										-11.7	-34.6	-26.7	-34.6
1994	-41.5	-35.2	-39.9	-17.7	-2.9	1.6	3.9	-1.4	-8.6	-16.7	-37.0	-37.9	-41.5
1995	-32.3	-33.6	-38.4	-6.3	-3.5	0.4	4.5	2.0	0.9	-11.9	-6.5		-38.4
1996		-31.5	-21.4	-21.5	-5.1	-2.9	7.0	0.7	-8.3	-28.0	-29.6	-36.0	-36.0
1997	-43.5	-21.1	-27.0	-18.7	-6.0	0.3	7.2	2.3	-1.9	-17.8	-19.2	-30.2	-43.5
1998	-41.4	-20.4	-16.3	-8.4	-1.6	2.4	7.0	1.8	-4.1	-15.0	-24.5	-34.1	-41.4
1999	-40.3	-40.9	-26.4	-13.6	-4.2	3.3	3.4	0.8	-7.7	-22.6	-26.5	-37.5	-40.9
2000	-39.8	-14.0	-20.2	-18.8	-5.9	3.9	5.0	0.9	-10.5	-17.2	-21.2	-35.5	-39.8
2001	-22.7	-24.7	-27.8	-14.1	-5.0	3.6	6.1	5.9	-0.5	-18.6	-25.5	-30.7	-30.7
2002	-33.8	-24.0	-27.0	-17.2	-13.7	3.3	4.3	2.5	-1.7	-7.2	-14.6	-21.8	-33.8
2003	-27.8	-28.9			-6.6	3.5	5.7	2.6	-9.2	-6.1	-30.0	-30.0	-30.0
2004	-36.0	-34.0	-30.0	-21.0	-3.0	2.7	7.3	-0.9	-9.4	-10.2			-36.0
2005	-36.0			-0.9	0.4	3.6	14.1	1.2	-0.7	-8.7	-32.0	-35.2	-36.0
2006	-42.5	-33.0	-35.2	-20.4	-8.5	-5.2	6.1	-0.9	-1.9	-2.9	-39.5	-31.5	-42.5
2007	-36.8	-42	-21.2	-21.1	-3.8	5.6		3.9	-5.3	-10.2	-15.2	-26.8	-42.0
2008	-26.8	-46	-32.1	-18.2	-10	4.1		1.1	-11	-13.4			-46.0
2009					-6.1	2.1	4.1	2.4	-7	-9	-24.1	-20.2	
2010						4.3	6.9	2.9	-10.1	-10.3	-8.5		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APPENDIX B

DESIGN MEMORANDUM CCL-BCM3

Design Memorandum CCL-BCM3

Date: November 8, 2000 **Our File:** 013.05

To: Viceroy Resource Corporation Brewery Creek Mine

Brad Thrall (bthrall@viceroyresource.com)

From: Clearwater Consultants Ltd.

Peter S. McCreath (pmccreath@cs.com)

Subject: Brewery Creek Mine - Hydrology Update 2000

Design Memorandum CCL-BCM1 dated November 13, 1998 presented a review of hydrological conditions for the Brewery Creek Mine site based on climatic data available up to September 1998. This memorandum CCL-BCM3 presents the results of an update by Clearwater Consultants Ltd. of the hydrological conditions and key design parameters for the site. The update has been based on all the available precipitation, evaporation and snowsurvey data collected at Brewery Creek and at regional sources up to August 2000.

1. Available Data

Available hydrologic data at the Brewery Creek Mine site include the following:

- monthly total precipitation data for a total of 77 months between June 1991 and August 2000. The data collection has been essentially continuous since September 1994;
- snowpack survey data at a number of locations around the site since 1995.
- monthly pan evaporation data during the non-freezing period (typically May through September) for a total of 16 months from July 1997 to August 2000.

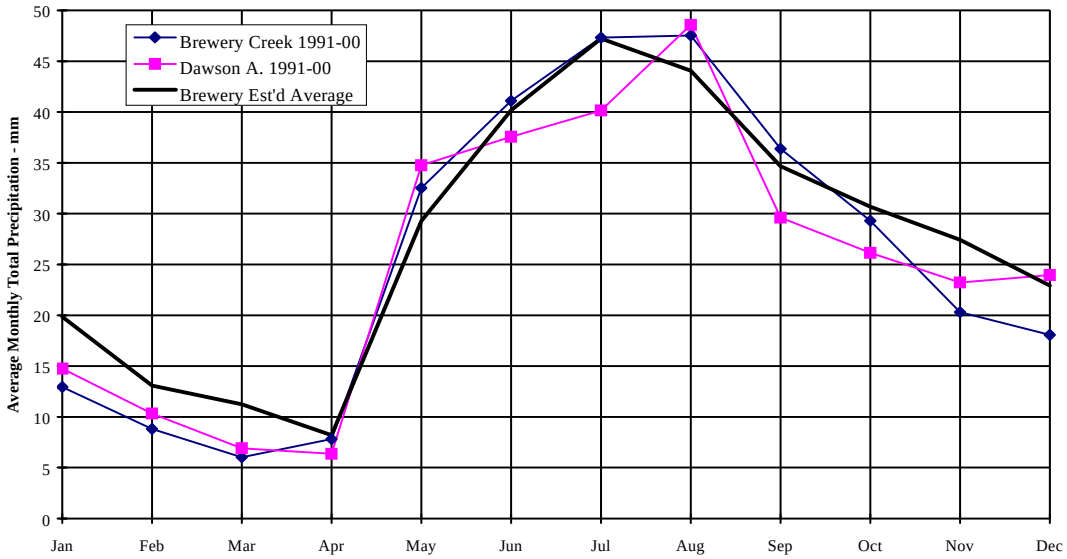
Regional data used in the comparisons reported herein include:

- monthly precipitation, rainfall and snowfall data reported by Environment Canada for the Dawson Airport station for the period February 1976 to March 2000;
- snowpack survey data reported by the Water Resources Division of DIAND for the period 1975 to 2000;
- Monthly lake evaporation data reported by Environment Canada for stations at Pelly Ranch (June 1964 to July 1998) and at Whitehorse Airport (August 1974 to June 1996).

2. Precipitation

Table 1 summarizes all the available concurrent monthly total precipitation data for Brewery Creek Mine and for Dawson Airport. Figure 1 presents a comparison of the average monthly values over the common period. Comparing annual average total precipitation for the two stations over the common months of data indicates that on average the Brewery Creek site experiences about 2% more precipitation per year than Dawson A. Based on the concurrent data and the long-term average total precipitation at Dawson A. of 323 mm, the estimated long-term average annual total precipitation for Brewery Creek Mine is 329 mm.

FIGURE 1 - Brewery Creek & Dawson A. Average Total Precipitation



Frequency analysis were carried out on total annual precipitation for the complete period of record for Dawson A. Applying a factor of 1.0193, corresponding values were estimated for Brewery Creek. The results of the frequency analysis are shown in Table 2.

3. Snowpack

Brewery Creek personnel have collected snowpack survey data since 1995 at a number of locations around the mine site. Data collection starts in early November and continues until early to mid-April each year. Typically, all snow has melted from the leach pad and in the general area of the leach pad by the end of April. Some snow remains on the ground into May in undisturbed forested areas around the site. Regional snowsurvey data are available since 1975 for the Midnight Dome station operated by DIAND Water Resources. Table 3 summarizes the available data for the 1995 to 2000 period.

The following comments are made on the available data:

- Snow accumulations start during October each year at Brewery Creek;
- Maximum snowpacks each year generally occur on or about April 1 for both Brewery Creek and for Midnight Dome, although annual maxima may occur earlier or later;
- Snow is generally all melted on and around the leach pad by the end of April whereas measurable snow may remain on the ground at Midnight Dome until at mid- or late May;
- Snowpack water equivalents for all locations around Brewery Creek are consistently less than values recorded at Midnight Dome;
- For all data, Brewery Creek maximum April 1 snowpacks are about 66% of the Midnight Dome values. Measurements taken on natural ground near April 1 at Brewery Creek are about 71% of the Midnight Dome values;

- Snowpack water equivalents are lower within the leach pad area than on natural ground surrounding the leach pad;
- Variability in readings taken within the leach pad area reflects areas of additional snow accumulation by drifting, typically near the bottom of the slopes, and exposed areas subject to removal of snow by wind, typically on the flat top of the heap;
- Areas under active leach during the winter appear to experience lower maximum snowpacks than areas not under active leaching, possibly due to some melting of snow during the winter over the actively leaching areas.

Maximum annual snowpacks applicable to the leach pad area at Brewery Creek were estimated using different methods. The results are shown in Table 4 and described following:

- Method "A" involved carrying out a frequency analysis of the 26 years of annual maximum snowpacks reported for Midnight Dome and multiplying the results by 0.709, the average ratio of Brewery Creek to Midnight Dome April 1 snowpacks measured on natural ground from 1995 to 2000. The estimated 100 year return period snowpack for Midnight Dome is 258 mm of water equivalent (Table 4). The resulting estimated 100 year return period snowpack for Brewery Creek was 183 mm of water equivalent;
- Method "B" involved carrying out a frequency analysis of the 22 years of cumulative October to March total precipitation reported for Dawson A. and multiplying the results by 1.0193, the average ratio of Brewery Creek to Dawson A. total average annual precipitation. The resulting estimated 100-year return period snowpack for Brewery Creek was 210 mm of water equivalent.

It is recommended that, for the evaluation of water storage requirements for the Brewery Creek heap leach pad, the most conservative estimate of the 100 year return period maximum snowpack accumulation should be adopted. Given the long period of record available at Midnight Dome and the variability in data collected at and around the Brewery Creek site over the last six years (Table 3), it is recommended that the estimated 100 year return period snowpack for Midnight Dome of 258 mm of water equivalent be adopted for the Brewery Creek area.

4. Lake Evaporation

Pan evaporation data have been collected at Brewery Creek during the warm weather season for a total of 16 complete months between July 1997 and August 2000. The evaporation pan is located beside the overflow pond. The data are shown on Table 5. Also shown on the Table are monthly lake evaporation depths calculated for Brewery Creek using a pan coefficient of 0.70 and regional long-term average lake evaporation data reported for stations at Pelly Ranch (1964 to 1998) and at Whitehorse Airport (1974 to 1996). A comparison of average monthly temperatures at Brewery Creek and at Pelly Ranch shown on the Table indicates that average temperatures during the summer period are similar for the two stations.

Based on the data in Table 5, average lake evaporation at Brewery Creek was estimated using three methods as follows:

- Method "A" assumes that Brewery Creek lake evaporation is equal to Pelly Ranch lake evaporation, based on (1) the similarity of average summer temperatures, and, (2) the comparable measured total June to September lake evaporation at the two stations. The

resulting estimated annual average lake evaporation at Brewery Creek would be about 450 mm;

- Method “B” assumes lake evaporation decreases at a rate of 10% per 350 m increase in elevation from Pelly Ranch at elevation 454 m to Brewery Creek at about elevation 850 m. This rate of decrease for evaporation with elevation has been suggested by the BC Ministry of Environment in the “Manual of Operational Hydrology” as being applicable to the interior of British Columbia. If this trend is assumed to be also applicable to Yukon, the resulting estimated annual average lake evaporation at Brewery Creek would be about 400 mm.
- Method "C" assumes that the pan evaporation data measured directly at the Brewery Creek site from 1997 to 2000 in conjunction with an assumed pan coefficient of 0.70 together provide sufficient site-specific data to estimate the long-term average lake evaporation at the site. The resulting estimated annual average lake evaporation at Brewery Creek would be about 390 mm

It is recommended that the lower value of 390 to 400 mm be conservatively adopted for average annual lake evaporation at Brewery Creek for the evaluation of water storage requirements for the heap leach pad. Make-up water requirements should be conservatively assessed using the higher value of about 450 mm.

5. Conclusions

The on-going collection of precipitation, snowsurvey and evaporation data at the Brewery Creek mine site has allowed key design parameters to be re-evaluated using actual site data and concurrent and long-term regional data. Key design parameters include: average annual total precipitation, the 100 year return period wet year total precipitation, the 100 year maximum snowpack, and average lake evaporation. Table 6 compares values estimated previously in the Water License (1995), values estimated in 1998, and currently-estimated values.

The Brewery Creek Mine site is drier than assumed in the Water License: annual precipitation is lower and lake evaporation is higher as shown on Table 6. The revised values should be used for the on-going evaluation of the heap water balance and determination of solution storage requirements. Data collection activities should be continued for all the parameters discussed herein and the data should be fully re-evaluated every year.

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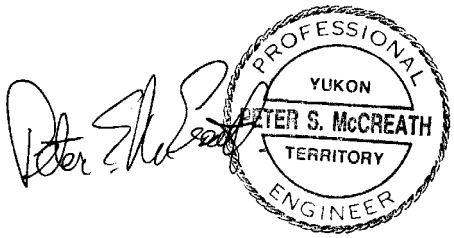


Peter S. McCreath P.Eng.

Table 1 - Monthly Total Precipitation - Brewery Creek Mine and Dawson Airport

Brewery Creek Mine - Total Precipitation (mm)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
1991						16.7	23.8	94.1	43.7				
1992													
1993										20.0	35.3	20.3	
1994									42.4	40.4	32.7	14.2	
1995	19.8	19.1	10.1	5.5	49.4	39.1	97.9	45.2	64.4	31.3			
1996	9.3	10.6	6.5	6.6	20.0	38.1	11.1	30.7	34.8	11.9	18.3	8.9	206.8
1997	9.5	3.6	4.1	8.3	24.2	62.0	36.6	52.9	43.3	30.6	13.0	25.4	313.5
1998	5.9	4.7	3.6	4.1	31.3	36.6	21.9	25.4	18.3	20.6	6.5	7.7	186.6
1999	16.0	10.1	10.1	18.9	39.0	40.8	44.3	54.4	7.7	50.2	16.0	31.9	339.4
2000	17.1	4.7	1.8	3.5	31.3	54.4	95.7	30.0					
Mean	12.9	8.8	6.0	7.8	32.5	41.1	47.3	47.5	36.4	29.3	20.3	18.1	308.1

Dawson A. - Total Precipitation (mm) - Common Months with Brewery Creek Mine

1991						21.8	56.6	71.8	49.6				
1992													
1993										13.9	34.8	15.5	
1994									24.0	43.4	27.8	8.2	
1995	11.4	13.2	11.8	5.8	61.4	20.2	64.8	35.4	41.2	27.2			
1996	8.3	14.6	8.2	7.0	11.5	28.6	10.7	41.0	31.8	30.4	18.0	20.0	230.1
1997	17.6	6.0	5.4	5.2	24.2	84.6	60.8	53.8	16.2	34.8	14.4	28.0	351.0
1998	11.7	4.0	0.0	0.2	42.4	53.4	16.0	25.8	21.8	7.1	8.3	16.0	206.7
1999	11.0	14.6	10.8	13.6	34.3	16.7	32.0	63.7	22.6		36.0	56.0	
2000	28.4	9.6	5.2										
Mean	14.7	10.3	6.9	6.4	34.8	37.6	40.2	48.6	29.6	26.1	23.2	24.0	302.3

Comparison of Mean Monthly Total Precipitation

Station	Period	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec	Annual
Brewery Creek	1991-00	12.9	8.8	6.0	7.8	32.5	41.1	47.3	47.5	36.4	29.3	20.3	18.1	308.1
Dawson A.	1991-00	14.7	10.3	6.9	6.4	34.8	37.6	40.2	48.6	29.6	26.1	23.2	24.0	302.3
Dawson A.	1976-00	19.5	12.8	11.0	8.0	28.7	39.4	46.3	43.2	34.0	30.1	26.9	22.5	322.6
Brewery Creek	**Average**	**19.9**	**13.1**	**11.2**	**8.2**	**29.3**	**40.2**	**47.2**	**44.1**	**34.7**	**30.7**	**27.4**	**22.9**	**328.8**

Average ratio (Brewery : Dawson) for Annual Total Precipitation = 1.0193

Table 2 - Annual Total Precipitation Frequency Analysis

Return Period (years)	Exceedance Probability	Annual Total Precipitation (mm)	
		Dawson A	Brewery Creek
2	50.0%	319	325
5	20.0%	375	382
10	10.0%	405	413
20	5.0%	431	439
50	2.0%	461	470
100	1.0%	482	491
200	0.5%	501	511
500	0.2%	525	535

Note - Brewery Creek Total Precipitation = 1.0193 times Dawson A. Total Precipitation.

Table 3 - Snowpack Survey Data - Brewery Creek Mine and Midnight Dome

Snowpack Water Equivalent (mm water)

Year	Station	Comment	Elev (m)	Note	Jan 1	Feb 1	March 1	April 1	May 1
1995	Brewery Creek	Natural Ground	775-830	1		78.5	87.6		
	Midnight Dome	DIAND natural ground	855	2			150	170	123
1996	Brewery Creek	Natural Ground	760-780	3		78.4		92.4	
	Midnight Dome	DIAND natural ground	855	2			91	109	101
1997	Brewery Creek	Natural Ground	740-850	4	90.3	102.3	104.3	107.6	
	Brewery Creek	Within leach pad area		5	94.6	69.1	97.5	105.4	
	Brewery Creek	All Data	740-850	6	80.7	87.7	96.8	102.8	
	Midnight Dome	DIAND natural ground	855	2			146	161	117
1998	Brewery Creek	Natural Ground	740-850	4	36.5	62.5	72.5	97.9	
	Brewery Creek	Leach pad slopes cells 1,2,4	800-820	7	71.9	54.3	74.2	28.9	
	Brewery Creek	Leach pad slopes cell 5	810-830	7	27.3	52.2	41.2	85.4	
	Brewery Creek	Leach pad top cells 3 & 4	820-840	7	34.2	24.3	39.6	9.2	
	Brewery Creek	Leach Pad weighted average	800-840	8	36.7	31.2	43.1	22.2	
	Brewery Creek	All Data	740-850	6	39.2	51.9	61.9	69.1	
	Midnight Dome	DIAND natural ground	855	2			129	119	92
1999	Brewery Creek	Natural Ground	740-850		40.6	41.8	80.4	86.9	
	Brewery Creek	Leach Pad Top (837 lift)	837	9	39.7	46.1	41.0		
	Brewery Creek	Leach Pad Slopes (cells1,2,5)	800-830	9	46.1	43.0	64.0	84.4	
	Brewery Creek	Leach Pad weighted average	800-840	9	42.0	45.0	49.3		
	Brewery Creek	All Data	740-850	6	42.7	42.9	66.2	88.6	
	Midnight Dome	DIAND natural ground	855	2			84	90	92
2000	Brewery Creek	Natural Ground	740-850		64.9	85.5	96.2	94.5	
	Brewery Creek	Leach Pad Top (830 lift)	830	9	8.5	46.7			
	Brewery Creek	Leach Pad Slopes (cells1,7)	800-830	9	141.6	181.2			
	Brewery Creek	Leach Pad weighted average	800-840	9	56.4	95.1			
	Brewery Creek	All Data	740-850	6	46.6	75.8	96.2	94.5	
	Midnight Dome	DIAND natural ground	855	2			187	197	195

Average Snowpack Water Equivalents (mm)

Years	Station	Comment	Elev	Note(s)	Jan 1	Feb 1	March 1	April 1	May 1
1995-00	Brewery Creek	Natural Ground	740-850		58.1	74.8	88.2	95.9	
	Brewery Creek	Within leach pad area	800-840		57.4	48.4	63.3	70.7	
	Brewery Creek	All Data	740-850		52.3	69.2	81.7	89.5	
	Midnight Dome	Common years with BCM	855				139.2	135.2	120.0
1975-00	Midnight Dome	All available years				96.0	128.6	148.6	121.8
Midnight Dome – Average (1995-2000) / (1975-2000)							108.2%	91.0%	98.5%
1995-00	**Ratios of (Brewery Creek to Midnight Dome)**								
		Natural Ground					63.4%	**70.9%**	
		Within leach pad area					45.5%	52.3%	
		All Data					58.7%	66.2%	

Notes for Table 3

1) 1995 BCM data includes sites at Canadian Zone, within leach pad and outside leach pad. No ore in place on heap. Averages for all sample points.
2) All Midnight Dome data reported by DIAND Water Resources. Feb. 1 data not collected since 1985
3) 1996 BCM data includes sites within and outside leach pad area. No ore on heap. Averages for all sample points.
4) 1997 and 1998 BCM data for "Natural Ground" include six locations surrounding leach pad.
5) 1997 BCM data "Within leach pad area" is area-weighted average, 6 to 9 sites per month covering active & inactive leaching areas. Total 1.9 Mt ore, 0.5 Mt under leach.
6) 1997 to 2000 BCM "All Data" reflects average of all individual sample points for all locations.
7) 1998 BCM data "Leach pad slopes cells 1, 2, 4" represents approx. 20,000 m^2 area on pad; "Leach pad slopes cell 5" represents approx. 31,000 m^2: and, "Leach pad top cells 3 & 4" represents approx. 161,000 m^2 on pad. Areas estimated by BCM personnel in the field. Total 3.9 Mt ore with 1.1 Mt under leach.
8) 1998 to 2000 BCM data "Leach pad weighted average" represents average SWE for entire leach pad area based on relative areas and SWE's.
9) For 1999 & 2000, "Leach Pad Top" estimated by BCM personnel as 64% of total area, "Leach Pad Slopes" equal to 36% of total area to estimate "Leach Pad Weighted Average" snow water equivalents (SWE).
10) Brewery Creek data shown for Jan 1, 2000 collected on Jan 14, 2000.

Table 4 - Maximum Annual Snowpack Frequency Analysis

Return Period (years)	Exceedance Probability	Midnight Dome Max. Snowpack	Dawson A. Precipitation (Note 1)	Brewery Creek Snowpack	
				Method A (Note 2)	Method B (Note 2)
1.050	95.2%	94	82	67	84
1.250	80.0%	120	99	85	101
2	50.0%	150	120	106	122
5	20.0%	185	148	131	151
10	10.0%	205	164	145	167
20	5.0%	223	178	158	181
50	2.0%	244	194	173	198
100	1.0%	258	206	183	210
200	0.5%	272	216	193	220
500	0.2%	290	229	206	233

Notes for Table 4

1) "Dawson A. Precipitation" corresponds to cumulative total precipitation from October 1 to March 31. Frequency analysis based on 1976 - 2000 data.
2) Potential maximum snowpack at Brewery Creek estimated as follows:
Method A: Brewery Creek snowpack = 0.709 times snowpack at Midnight Dome, or,
Method B: Brewery Creek snowpack = 1.0193 times total October to March precipitation at Dawson A, or, Brewery Creek snowpack = Midnight Dome snowpack
3) All snowpacks and precipitation in millimetres of water equivalent.

Table 5 - Lake Evaporation

Monthly Pan Evaporation Data - Brewery Creek

	May	June	July	August	September	YEAR
1997			138.0	85.8	82.2	
1998		148.0	199.6	128.5	53.3	
1999	75.9	181.8	169.8	128.5	56.8	
2000	67.2	155.8	106.6	80.0		
Average	67.2	161.9	153.5	105.7	64.1	552.4

Calculated Monthly Lake Evaporation - Brewery Creek

(using pan coefficient of 0.70)

	May	June	July	August	September	YEAR
1997			96.6	60.1	57.5	
1998		103.6	139.7	90.0	37.3	
1999	53.1	127.3	118.9	90.0	39.8	
2000	47.0	109.1	74.6	56.0		
Average	50.1	113.3	107.5	74.0	44.9	389.5

Total June Through September = 339.7 mm

Regional Lake Evaporation – Long-Term Averages

	May	June	July	August	September	YEAR
Pelly Ranch (Elev. 454 m)	106.0	121.0	111.3	79.7	36.8	454.8
Whitehorse (Elev. 703 m)	106.4	127.0	114.5	96.2	50.3	494.4

Total June Through September = 348.8 mm

Temperatures (^{o}C) - Brewery Creek Mine and Pelly Ranch

Station	Period	May	June	July	August	September	Average
Brewery Creek	1997-00	6.9	13.9	15.2	11.3	6.6	11.0
Pelly Ranch	Average	7.5	13.0	15.1	12.5	6.5	10.9

Estimated Average Lake Evaporation (mm) - Brewery Creek

	May	June	July	August	September	YEAR
Method A	105	120	110	80	35	450
Method B	94	107	99	71	32	403
Method C	50	113	107	74	45	390

- Method A assumes Brewery Creek lake evaporation is equal to Pelly Ranch lake evaporation.
- Method B decreases Pelly Ranch evaporation at 10% per 350 m elevation, factor of 0.887.
- Method C assumes Brewery Creek lake evaporation is equal to the estimated average lake evaporation 1997-2000 at Brewery Creek (calculated using pan coefficient of 0.70)

Table 6 - Comparison of Key Hydrological Design Parameters - Brewery Creek Mine

Parameter	Value reported in Water License *	Revised Value (Memo BCM1 ** November 1998)	Revised Value (Memo BCM3 November 2000)
Average Annual Total Precipitation	420 mm	329 mm	329 mm
100 Year Wet year Precipitation	610 mm	513 mm	491 mm
100 Year Maximum Snowpack	405 mm	229 mm	258 mm
Average Lake Evaporation	350 mm	400 mm	400 mm

References

***** Loki Gold Corporation (1995) – Brewery Creek Project Solution Management Plan, Appendix A, “Heap Leach Water Balance Sensitivity”, April 13, 1995.

** Clearwater Consultants Ltd. (1998) – "Brewery Creek Mine – Hydrology Review", Design Memorandum CCL-BCM1 prepared for Viceroy Minerals Corporation Brewery Creek Mine, November 13, 1998, File 013.03

APPENDIX B

SURFACE WATER QUALITY AND GROUNDWATER DATA SUMMARY

ALEXCO ENVIRONMENTAL GROUP

BREWERY CREEK MINE

2015 WATER QUALITY ASSESSMENT

February 2016

Prepared for:

GOLDEN PREDATOR EXPLORATION LTD.

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF APPENDICES

1 INTRODUCTION

1.1 BACKGROUND

Mining activities were carried out at the Brewery Creek Mine over a five-year period between 1996 and 2000 by Loki Gold Corp. and Viceroy Resource Corp. Ore processing (9.5 million tonnes of ore) employed conventional heap leach technology on run of mine ore, commencing in November 1996. Brewery Creek originally operated under Water Use Licence (WUL) QZ94-003, issued in August 1995 and under Quartz Mining License (QML) A99-001 issued in June 1999. In July 1997 the mine began operating under WUL QZ96-007, created as a result of an amendment application to WUL QZ94-003. Brewery Creek ceased active mining operations in September of 2000 and no additional ore was added to the heap leach after this date. This cessation date was more than two years earlier than predicted in the planning and permitting stages, due primarily to depressed gold prices. Active cyanide leaching of the heap leach pad continued until December 2001. Detoxification of the heap leach was completed in the second and third quarters of 2002 with some release of detoxified waters over 2002 and 2003 and regular post closure monitoring. In March 2005 licences and permits were again transferred, from Viceroy to Alexco Resource Corp. (after Alexco purchased the property. (Access, 2010)

In 2011, Alexco applied for an amendment QZ11-035 to licence QZ96-007 with the aim of clarifying and unifying licence conditions to reflect the current post-closure phase of the mine, in anticipation of a transfer of ownership to Golden Predator Corp. (now Golden Predator Exploration Ltd.). In 2012 Golden Predator Corp. purchased the Brewery Creek property from Alexco with the intent of amending the Water Licence to re-open the mine site.

The subject of this report is an examination of the results of the 2015 water quality monitoring program carried out by Golden Predator at the Brewery Creek Mine pursuant to the licence conditions of WL QZ96-007. The results and discussion herein include results of all sampling carried out over the course of the mine life, including a discussion of the 2015 data relative to historical conditions. The 2015 monitoring program reflects the current post-closure phase of the mine life.

The principal receiving creeks in the Brewery Creek Mine area are Lee Creek, Laura Creek, and Carolyn Creek which are tributaries of the South Klondike River. Three additional creeks are included in this assessment: Pacific Creek, Carolyn Creek, and Lucky Creek, the main tributaries to Lee, Laura and Golden Creeks, respectively (Figure 1-1).

Lee Creek and Pacific Creek both occur in the northwest portion of the Brewery Creek property. Lee Creek headwaters originate 46 kilometres north of the property and flow due south, converging with Pacific Creek east of the property, eventually flowing into the South Klondike River. Pacific Creek headwaters originate immediately north of the mine in two separate forks, which converge and flow southwest into Lee Creek.

Laura and Carolyn Creeks receive runoff from a total combined area of 30.5 km^2. Flow in the upper reaches of these creeks is seasonal, while Lower Laura Creek[1] flows year round with the exception of occasional freezing conditions in winter. Carolyn Creek joins Laura Creek roughly two kilometres from its headwaters, with both eventually flowing to the South Klondike River via a wetlands area in Lower Laura Creek.

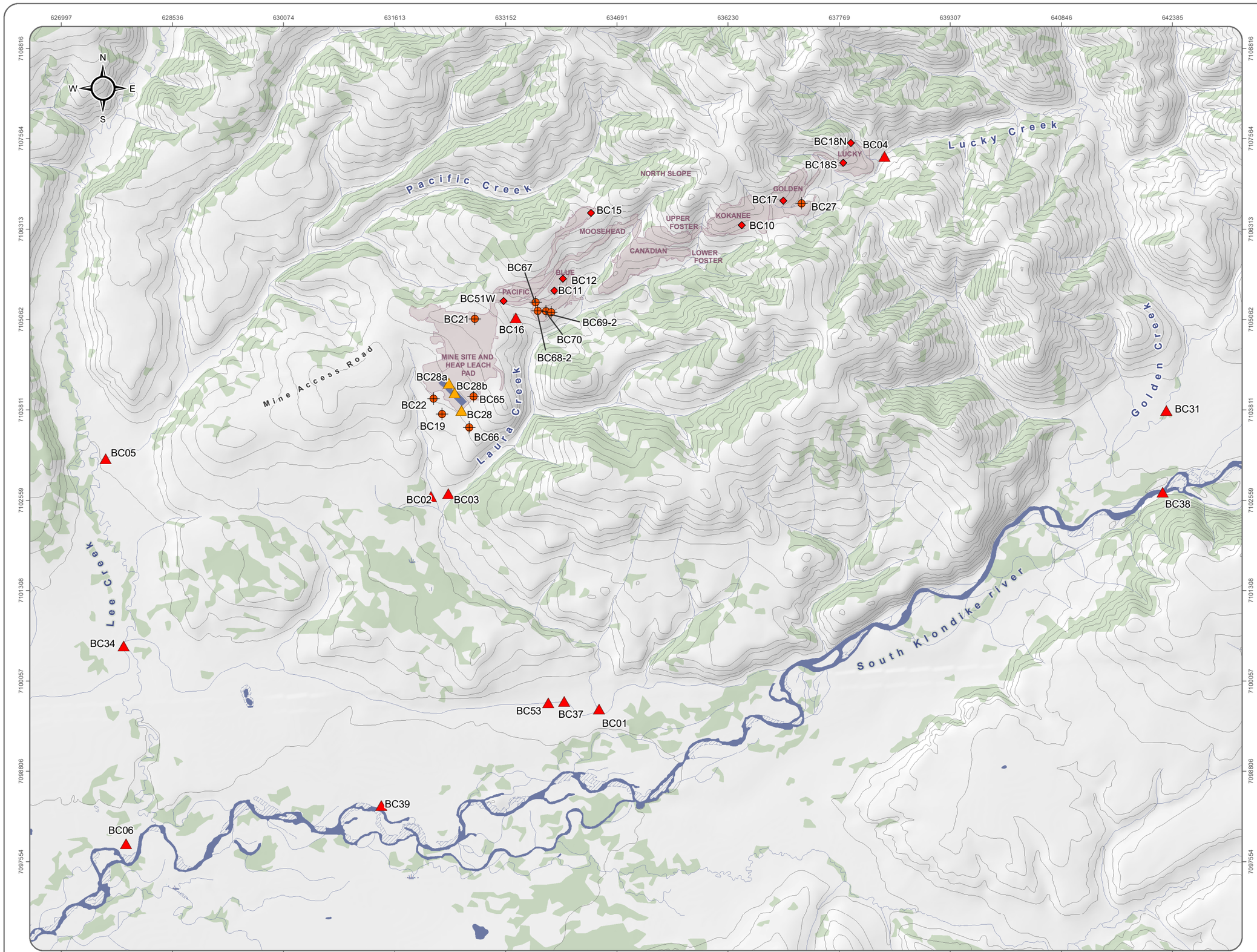
Laura and Carolyn Creeks were the historical receivers for mine effluent deposited from the Brewery Creek heap leach pad both during mining activities and post-closure reclamation. The leach pad and ponds were situated within the boundary of the two watersheds, and a land application system was employed during post-closure drain-down of the heap over the watershed boundary separating the streams.

The historical workings consist of seven open pit areas (nine pits total), which influenced the receiving watersheds variously. The following pits were worked during the past phase of mining at Brewery Creek:

- Pacific
- Blue
- West Canadian
- Canadian
- Upper Fosters
- Lower Fosters
- Kokanee
- Golden
- Lucky

The majority of mining occurred in the Laura Creek drainage; the Pacific, Blue, Canadian, Fosters and Kokanee developments, as well as a significant portion of the Moosehead development and the heap leach facility are all located within the Carolyn and Laura Creek watersheds. The Golden and Lucky developments lie within the Lucky Creek watershed, while the Moosehead pit also lies partially within the Pacific Creek catchment.

[1] Lower Laura Creek refers to the portion of Laura Creek between stations BC-53 and BC-39



BREWERY CREEK MINE

FIGURE 1-1
WATER QUALITY STATIONS

- Surface Water
- Groundwater
- Heap Effluent
- Pit/Dump Discharge

NAD 83 UTM Zone 7N

0 0.5 1 2 Kilometers

1:50,000 (when printed on 11 X 17 inch paper)

ALEXCO ENVIRONMENTAL GROUP

FEBRUARY 2016

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2 BREWERY CREEK MINE WATER QUALITY MONITORING PROGRAM

2.1 MONITORING PROGRAM

Environmental monitoring at Brewery Creek has transitioned to the post-closure phase, which as of 2015 involves annual monitoring of water quality surveillance sites where conditions allow. Sampling events are typically conducted in September or October, during low-flow conditions. The amount of environmental monitoring has declined since closure of the heap has been accomplished and the drain down solutions treated. Environmental monitoring under QZ96-007 during the post-closure period has been reduced commensurate with the expected level of site activity. The current water quality monitoring schedule is presented in Appendix A. Water quality sampling was performed as required by Schedule B of Water Licence QZ96-007, and results can be found in Appendix B to this memo.

2.2 EFFLUENT QUALITY STANDARDS AND WATER QUALITY GUIDELINES

Clause 46 of Water Licence QZ96-007 states that:

"Water quality at monitoring stations BC-31, BC-34 and BC-39 shall not exceed the water quality guidelines specified for the protection of aquatic life contained in the Canadian Environmental Quality Guidelines prepared by the Canadian Council of Ministers of Environment, as amended from time to time."

As such, for the receiving water quality data assessment, water quality parameters were screened against Canadian Water Quality Guidelines for Protection of Aquatic Life (CWQG; CCME 2012) (Table 2-1). Some water quality guidelines vary on the basis of water hardness (e.g., cadmium, copper, lead; CCME 2012). A water hardness of 251 mg/L (as $CaCO_3$) was used to select the appropriate guideline in such cases, as this represented the mean hardness of the pooled reference station data. This value can be considered conservative since median water hardness observed at receiving environment stations were often greater than 300 mg/L where toxicity may be somewhat less relative to water with hardness of 251 mg/L.

Two guidelines have been derived for nitrate under the CCME Water Quality Guidelines for Protection of Aquatic Life based on the species measured; the guideline for ionic nitrate is 13 mg/L, while for nitrate as nitrogen it is 3.0 mg/L. For results obtained prior to 2006, information on the nitrogen species measured is not available; therefore the more conservative guideline of 3.0 mg/L has been used for comparisons.

In addition to the CCME guideline, Laura Creek at station BC-39 has an established site-specific selenium criterion of 0.0038 mg/L as defined as per Clause 38(d) of Water Licence QZ96-007. Furthermore, the Laura Creek AMP (2004) indicated the company would also use a site specific selenium water quality standard (SSWQS) of 0.0038 mg/L at Laura Creek station BC-53. Therefore, this report includes the use of the SSWQS guideline for comparison on the Laura Creek and Carolyn Creek watersheds.

Table 2-1 Relevant Canadian Water Quality Guidelines Used in the Assessment

Parameter	Units	Guideline	
		Source	Value (mg/L)
Arsenic	mg/L	CWQG	0.005
Copper [a]	mg/L	CWQG	0.003
Lead [a]	mg/L	CWQG	0.007
Nitrate Nitrogen	mg/L	CWQG	3.00
Selenium	mg/L	CWQG/SSWQS	0.001/0.0038
Zinc	mg/L	CWQG	0.03
Total Suspended Solids	mg/L	n/a	n/a

a. Hardness-dependent; mean reference station hardness of 251mg/L used

For the receiving environment water quality assessment, a reference condition has also been established using pooled reference data for the Brewery Creek region collected between 2008 and 2012. These values reflect the upper limit on the range of variability in the region and can be used together with CCME guidelines and Water Licence standards, or where guidelines and standards are not available or appropriate. These reference guidelines are used in this report for comparison and assessment of the Lee Creek and Golden Creek watersheds. It has been determined that these reference conditions are not appropriate for use in the Laura Creek watershed, where reference data were not available for use in developing the reference condition.

For effluent and groundwater monitoring stations relating to heap effluent discharge via direct discharge and groundwater infiltration, water quality results were screened against the effluent quality standards established in Clause 42, 43 and 44 of WL QZ96-007 (Table 2-2). Clause 42 and 44 of the licence refer to standards for heap discharges either via land application or directly to surface water. Clause 43 refers to standards for groundwater stations immediately down gradient of the heap.

Table 2-2 Effluent Quality Standards (mg/L), Water License QZ96-007

Parameter	Maximum Concentration (mg/L)		
	Clause 42	Clause 43	Clause 44
WAD Cyanide	0.25	0.125	0.25
Total Cyanide	2.0	1.0	2.0
Ammonia (as N)	15.0	7.5	5.0
Copper	0.5	0.1	0.2
Arsenic	0.5	0.25	0.5
Antimony	1.0	0.5	1.0
Mercury	0.005	0.0025	0.005
Zinc	0.5	0.25	0.5
Selenium	0.75	0.3	0.25
Lead	0.2	0.1	0.2
Aluminum	1.0	3.0	1.0
Bismuth	0.5	0.25	0.5
Cadmium	0.1	0.05	0.1
Chromium	0.5	0.25	0.5
Iron	1.0	5.0	1.0
Manganese	2.0	6.0	2.0
Molybdenum	0.5	0.25	0.5
Nickel	0.8	0.25	0.5
Silver	0.1	0.05	0.1
pH	-	-	6.0 to 9.5
Suspended Solids	-	-	50

3 WATER QUALITY

3.1 RECEIVING ENVIRONMENT WATER QUALITY CONDITIONS

The following sections address the three main watersheds and tributaries in the project area, which are each assessed on three different levels. First, where relevant, a comment on the quality of the data is made with respect to both MDLs and the occurrence of zero values in the dataset for selected parameters. Second, the data is assessed in relation to the benchmark concentrations selected for this assessment (CCME and reference). Third and lastly, summary statistics and trends in the data are discussed, with a focus on the 2015 data in relation to historical results. At the end of each watershed chapter, the discussion expands to identify issues more broadly associated with each watershed on the whole, and summary remarks are made.

All water quality data for surface water, groundwater, and in-pit water is presented in summary tables within Appendix A.

3.1.1 Lucky and Golden Creeks

A total of three stations have been established on Lucky and Golden Creek watersheds to determine and assess water quality characteristics (Table 3-1). BC-04 is located on Lucky Creek below all mine related developments, and thus reflects the cumulative impact of all mining activities on that stream. Two stations are located on Golden Creek, one upstream of the confluence with Lucky Creek (BC-36), and the other downstream of it (BC-31). Monitoring at BC-31 began in 1991, before the commencement of mining, while monitoring at BC-04 began in 1995, shortly before mining commenced. BC-36 has been monitored periodically, beginning in 1996 for a year, and resuming again in mid-2007 until 2014.

Table 3-1 Water Quality Monitoring Stations on Lucky and Golden Creeks

Stations on Lucky and Golden Creeks		Included in Assessment
BC-36	Golden Creek upstream of Lucky Creek	Yes
BC-31	Golden Creek downstream of Lucky Creek	Yes
BC-04	Lucky Creek d/s from Lucky Pit	Yes

3.1.1.1 Observations: Selenium

Selenium concentrations were shown to exceed the CCME guideline in all samples and at all sites on Lucky and Golden Creeks in 2014. Data collected during monitoring prior to 2004 is confounded by the presence of high MDLs, although this has been resolved with lower detection limits in recent years, and it can be confirmed that both background and receiving waters are in excess of the CCME guideline in this watershed. Trends for selenium show no change over the last decade, as shown on Figure 3-1.

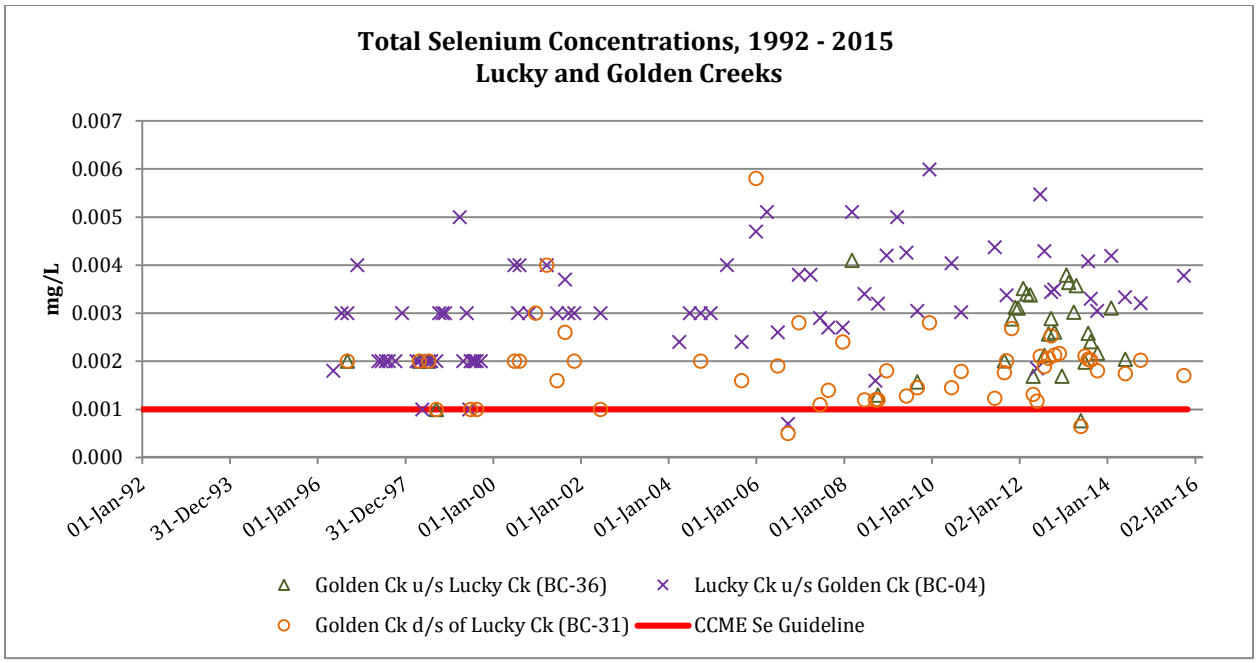
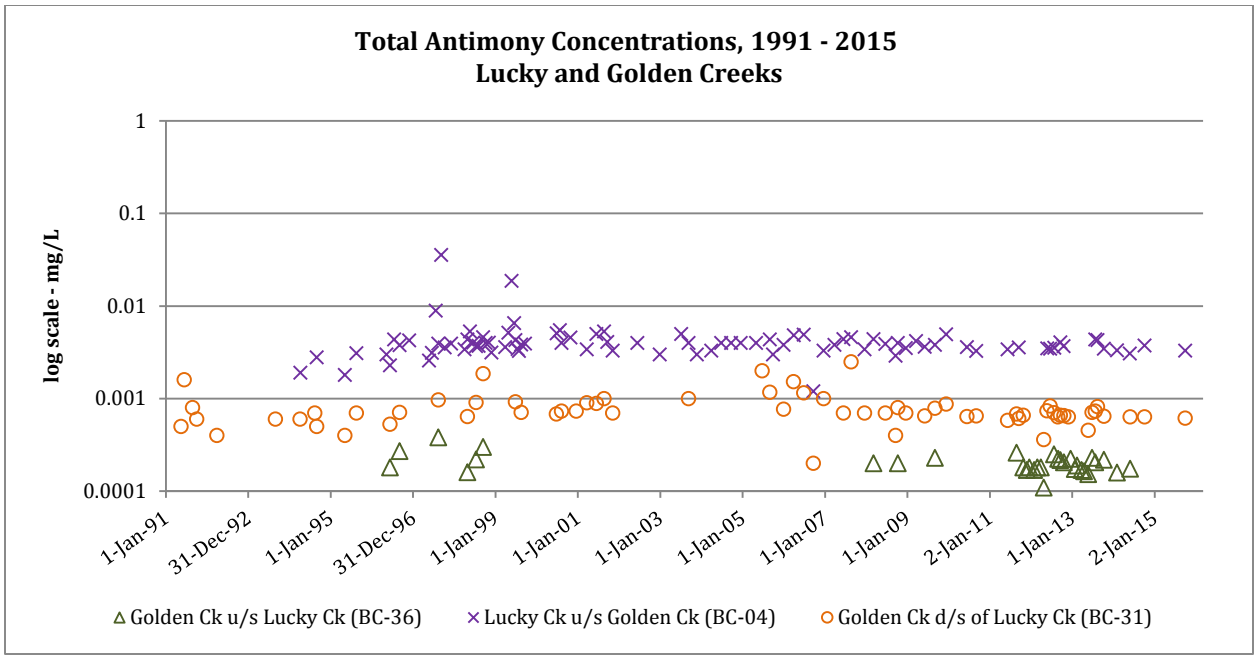


Figure 3-1 Selenium Concentrations on Lucky and Golden Creeks (1992-2015)

3.1.1.2 Observations: Antimony

Antimony concentrations at the background station on Golden Creek (BC-36) are statistically significantly lower than at the downstream receiving environment station (BC-31), as shown on Figure 3-2. Concentrations of antimony are much higher in Lucky Creek (mean background concentration at BC-36 is 1/20 of the concentration at BC-04 – note the logarithmic scale on the y-axis), suggesting that Lucky Creek is likely the primary source of antimony entering Golden Creek.

Antimony results at BC-31 have remained relatively constant throughout the pre-mining, mining, and decommissioning and reclamation phases of the mine life, indicating that antimony concentrations may not have been impacted greatly by mining activities. Moreover, concentrations remain well below the Ontario PWQO for antimony, and as such it poses little threat to the receiving environment in either Golden or Lucky Creeks.

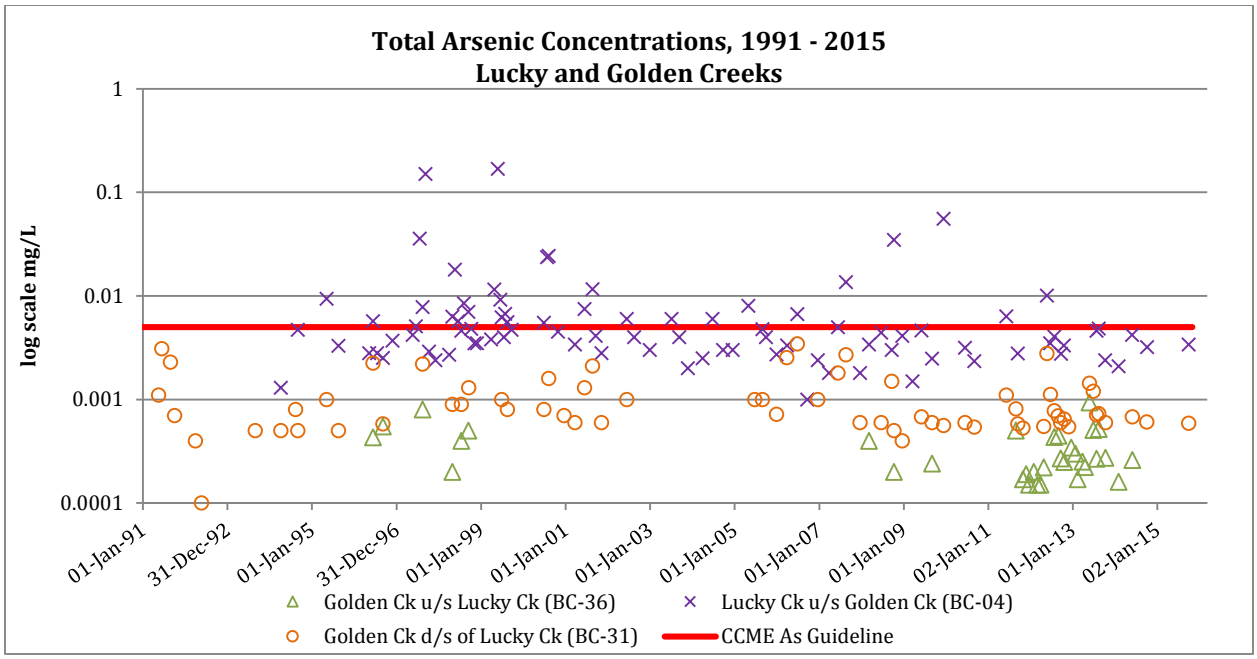


Note: Results that are below MDL are not shown on this figure

Figure 3-2 Antimony Concentrations on Lucky and Golden Creeks (1991-2015)

3.1.1.3 Observations: Arsenic

Arsenic concentrations in Golden and Lucky Creek exhibit a similar pattern to antimony in that it appears as though Lucky Creek is the primary source of arsenic to Golden Creek, as shown on Figure 3-3. Arsenic concentrations are consistent through all three mine phases, indicating a high background concentration as the result of the region's natural mineralization. Results at BC-04 are at or near the CCME guideline, exceeding the guideline in approximately 40 % of samples.



Note: Results that are below MDL are not shown on this figure

Figure 3-3 Arsenic Concentrations on Lucky and Golden Creeks (1991-2015)

3.1.1.4 Conditions during Decommissioning and Reclamation

Water quality data collected in the Lucky and Golden Creek watershed show no increasing or decreasing trend for the major parameters assessed in this report, or those regulated under QZ96-007. Data for all parameters assessed are generally at or below CCME guidelines with the exception of selenium, which appears to occur in naturally elevated concentrations in this region.

Additional parameters zinc, copper, lead, total suspended solids and nitrate are presented graphically in Appendix B for Lucky and Golden Creeks.

3.1.2 Lee and Pacific Creeks

Five water quality monitoring stations have been established on the two creeks; two on Lee Creek and three on Pacific Creek, as detailed in Table 3-2. Each creek contains one reference station, and at least one receiving environment station. The reference stations were used in establishing the reference benchmark for the watershed, while the receiving stations will be assessed here relative to those benchmarks.

Table 3-2 Water Quality Monitoring Stations on Pacific and Lee Creeks

Stations on Pacific Creek and Lee Creek		Included in Assessment
BC-35R	Pacific Creek Reference Station	Yes
BC-33	Lee Creek Reference Station	Yes
BC-35	Pacific Creek below Leach Pad	No
BC-05	Pacific Creek before confluence w/ Lee Creek	Yes
BC-34	Lee Creek below confluence w/ Pacific Creek	Yes

Station BC-35 on Pacific Creek is impacted by previous developments in the northern region of the property, including the Moosehead pit; however, station BC-05 is better situated to represent the cumulative downstream impacts of mining on this Creek. Additionally, data is not available for BC-35 earlier than 2008, which limits the usefulness of this station for background information. As such, BC-35 was not used or considered in this assessment.

In August 2011, a new reference station (BC-35R) was established on the north branch Pacific Creek as a result of a lack of available background data for this stream. Data collected at this station was used in establishing the reference conditions referred to in Section 2.2

3.1.2.1 Observations: Selenium

The interpretation of selenium results obtained on Lee and Pacific Creeks are confounded by the occurrence of high MDLs for the entire dataset, and zero values on some early dates prior to mining. The typical MDL observed was 0.001 mg/L, which precludes an interpretation of the data with respect to the CCME guideline (also 0.001mg/L). Although it is known that these values are below the CCME guideline of 0.001mg/L, it is not known to what degree. In addition, among all other results only two show values higher than a practical quantitative limit set at 3X the MDL. These results can be seen in Figure 3-44 as a flat line in the data series prior to 2002, and vary after that date. In the presence of high MDLs and lacking additional information, it is unclear at what rate selenium results exceed the CCME guideline, or to what degree they are below.

Despite these challenges, the pooled reference dataset for 2008 – 2012 provided insight into background conditions for the watershed. Selenium turned out to be one of two parameters, the other being copper, for which the reference condition was higher than the CCME guideline, and therefore a more appropriate benchmark for comparison.

Of all observations, only two were higher than the reference condition, as shown Figure 3-4, leading to a low rate of results exceeding the benchmark. Also notable was the low variability in selenium concentrations over the entire record; results were generally at or near the MDL for all samples collected. None of the results obtained in 2015 exceeded the background condition in the downstream receiver on Lee Creek (BC-34), although the results were in excess of the CCME guideline.

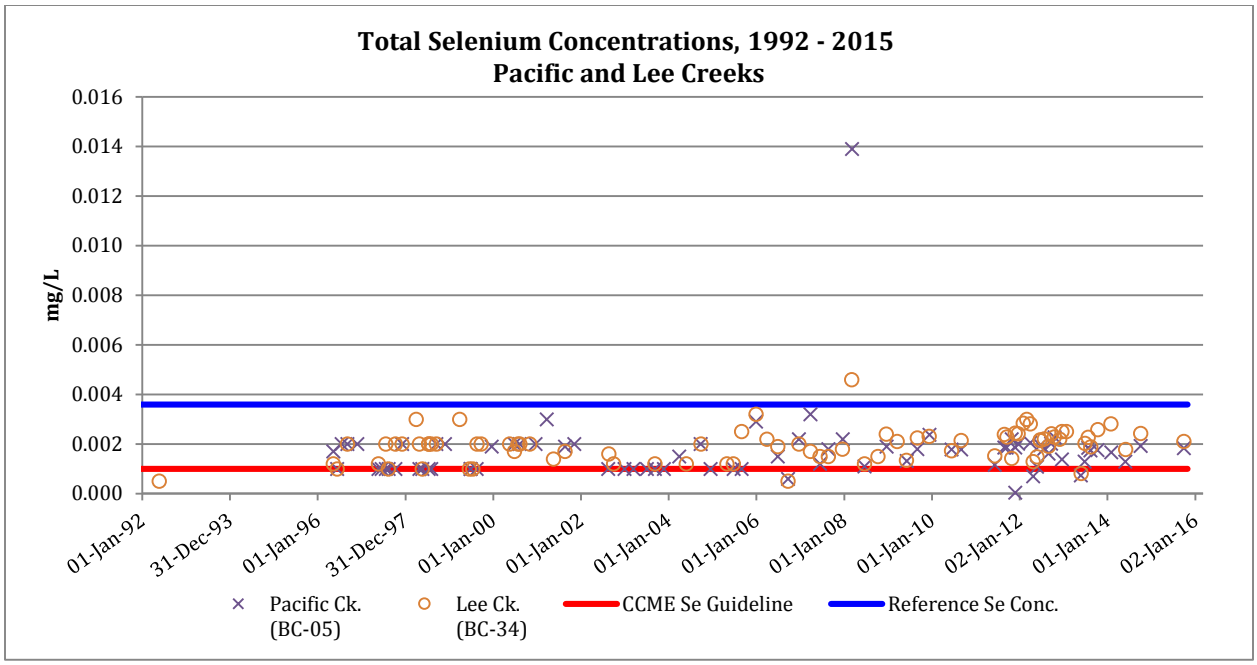


Figure 3-4 Selenium Concentrations on Pacific and Lee Creeks (1992-2015)

3.1.2.2 Observations: Antimony

Antimony results were not generally problematic with respect to high MDLs, except over one period at each station (BC-34: mid-2002 through mid-2005; BC-05: 2002 through mid-2005). In these cases, MDLs were higher than the reference concentration, but lower than the CCME guideline. Overall concentrations showed little variability from the 0.0003 mg/L reference benchmark, or between non-mining, mining, and reclamation periods, as shown on Figure 3-5. The mean at both station BC-05 (Pacific Creek receiver) and BC-34 (Lee Creek receiver) was less than the Ontario PWQO by two orders of magnitude.

Notably, in Pacific Creek, antimony exhibited consistently higher results at the downstream receiver station than the reference benchmark, including during pre-mining. None of the results obtained in 2015 exceeded the Ontario PWQO for antimony in the downstream receiver on Lee Creek.

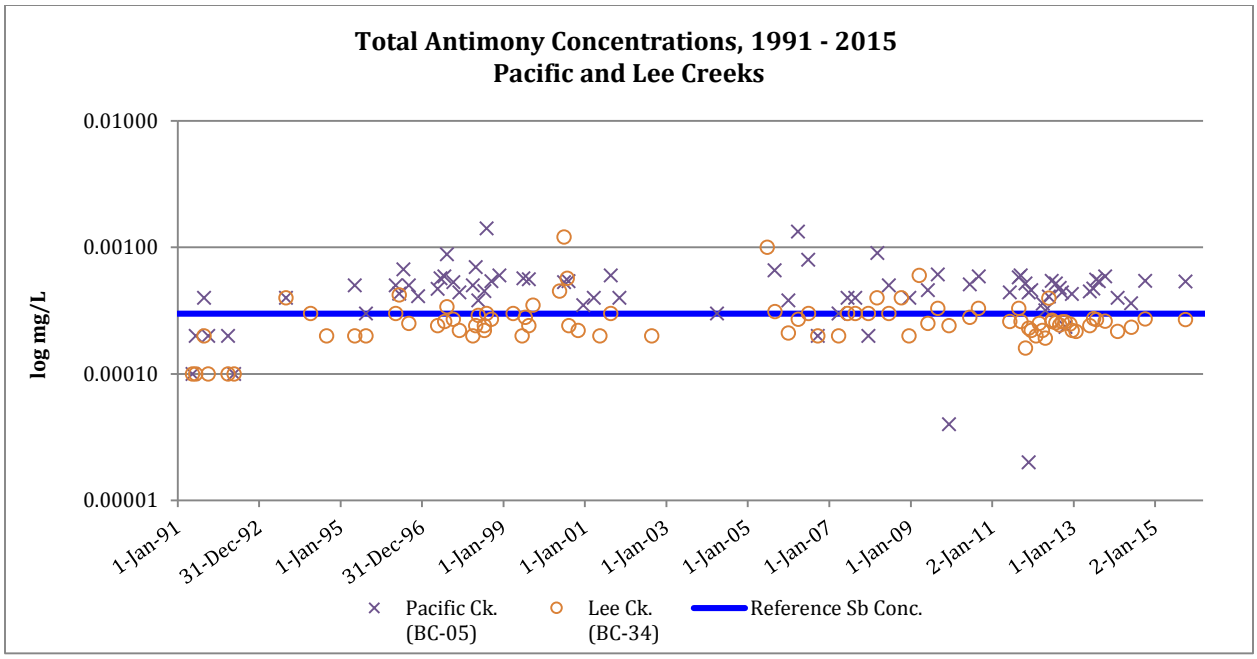


Figure 3-5 Antimony Concentrations on Pacific and Lee Creeks (1991-2015)

3.1.2.3 Observations: Arsenic

Arsenic exceeded background in >10% of samples in Pacific Creek during the mining and decommissioning and reclamation phases, and in Lee Creek during the decommissioning phase. It did not exceed reference in Pacific Creek on any occasions prior to mining, as shown on Figure 3-6. None of the results obtained in 2015 exceeded the CCME guideline for arsenic in the downstream receiver on Lee or Pacific Creeks.

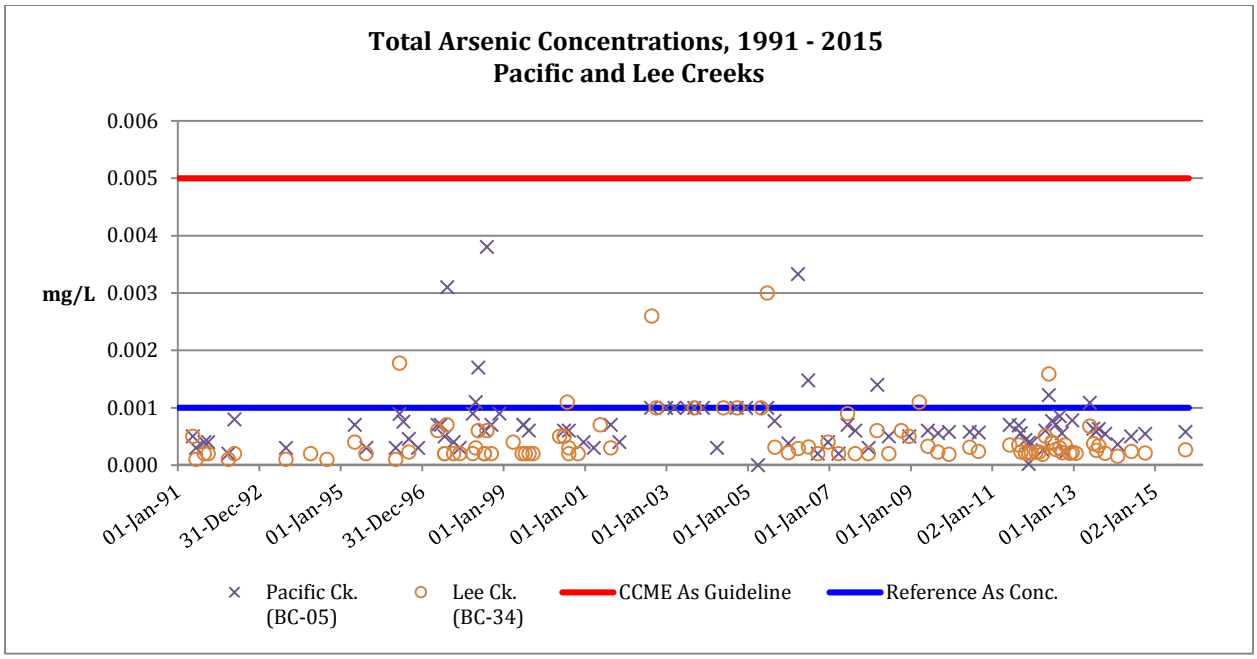


Figure 3-6 Arsenic Concentrations on Pacific and Lee Creeks (1991-2015)

3.1.2.4 Observations: Zinc, Copper and Lead

In Lee Creek, it was noted that zinc, copper and lead occasionally (>10% of the time) exceeded reference conditions. Zinc and copper (not lead) also occasionally (>10% of the time) exceeded the CCME guideline. However, these elements do not generally pose a threat in Lee Creek, as higher-than-reference concentrations occurred both prior to and after production activities began in 1996.

In Pacific Creek, lead exceeded the reference condition >10% of the time during pre-mining and mining conditions, but not during decommissioning and reclamation. Copper was found to exceed reference >10% of the time only during pre-mining conditions.

The pre-mine variability of zinc, copper and lead in Lee Creek, and of copper and lead in Pacific Creek above the reference condition indicate that these elements do not pose a risk to these watersheds as a result of mining. Moreover, the reference condition for both zinc and lead is below CCME guidelines.[2]

In 2015 copper, lead and zinc concentrations were all below their respective CCME guidelines, plots detailing trend data s well 2015 data are provided in Appendix B.

[2] *The CCME guideline for copper and the reference condition are roughly equal.*

3.1.2.5 Observations: Nitrate (as Nitrogen)

Nitrate concentrations in Lee and Pacific Creeks were well below the CCME guideline, as shown on Figure 3-7, during pre-mine, mining, and decommissioning and reclamation phases.

In 2004, a fire occurred at the Brewery Creek Mine primarily within the Laura and Carolyn Creek watersheds, but also affected the Lee and Pacific Creek watersheds to a lesser extent. Fire-caused changes in nutrient availability can have enormous effects on the downstream environment; in particular, fires have a great influence on nitrate nitrogen, as the availability of this nutrient increases following forest fires. The post-fire flush of inorganic nitrogen is not solely due to the physical breakdown of plant and animal tissues by fire; it is also a function of the enhanced activity of microbes in the warmer and more alkaline soil of a recently-burned forest.

Nitrate results in Pacific Creek, and to a lesser extent in Lee Creek, showed a minor spike in the years after the fire. Increased nutrient availability may be responsible for the high values observed in Pacific Creek in 2007 and 2008, and may be responsible for the increase in overall concentrations of nitrate on Lee Creek. None of the results obtained in 2015 exceeded the CCME guideline for nitrate in the downstream receiver on Lee Creek or on Pacific Creek.

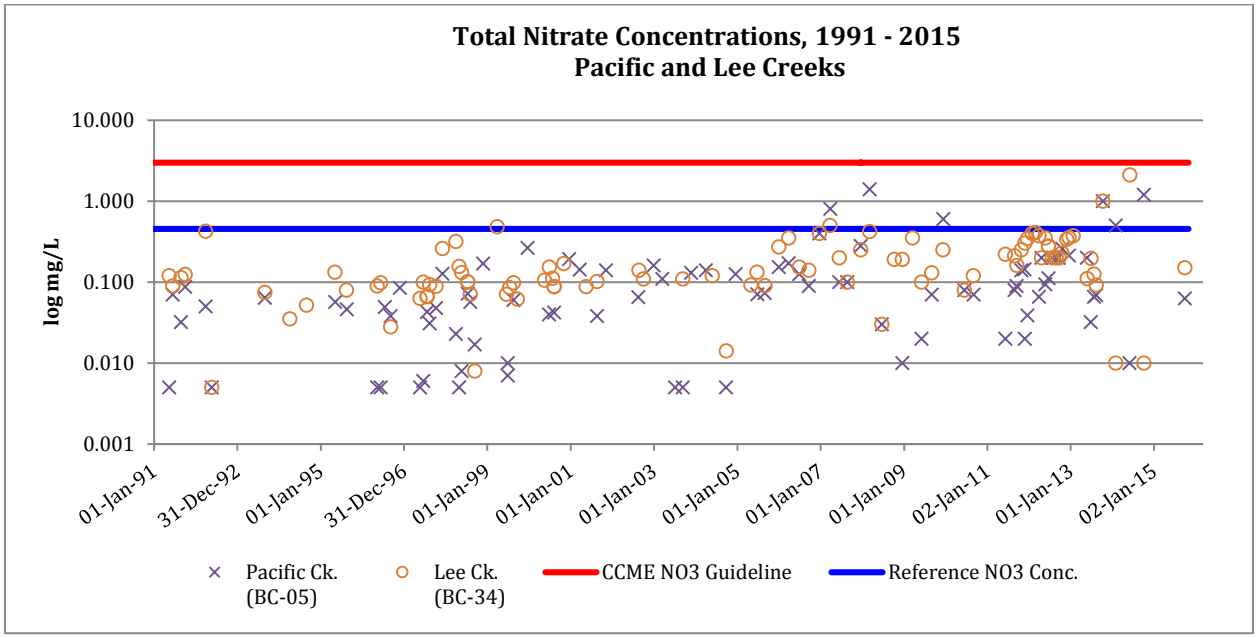


Figure 3-7 Nitrate as Nitrogen Concentrations on Pacific and Lee Creeks (1991-2015)

3.1.2.6 Conditions during Production and Decommissioning and Reclamation

Only one notable increase in metals content was noted in Pacific and Lee Creeks over the course of the mine life. Pacific Creek saw levels of arsenic above reference during mining and decommissioning and reclamation (>10% of samples), indicating that mining may have had an impact on arsenic concentrations. However, all arsenic samples analysed during this period of elevated values were well below the CCME guideline. Pacific Creek saw high levels of antimony (>50% exceeding reference) during all periods, indicating that the reference condition may not appropriately characterize antimony at this station. In Lee Creek, antimony, zinc, copper and lead concentrations were observed to exceed reference >10% of the time in all samples; however, this was found to be true during pre-mining conditions, and was not particular to mining or decommissioning and reclamation. Nitrate nitrogen exhibited values above the reference condition, but not CCME, in the years following the 2004 forest fire at Brewery Creek, indicating that the fire had a measurable effect on this parameter, and could also be influencing the results of other parameters.

The results of this study indicate that none of the parameters investigated in Lee Creek or Pacific Creek occur at concentrations which would lead to a designation as a contaminant of concern. In general, concentrations are below CCME guidelines and in cases where they exceed CCME, such variability is observed even during pre-mining conditions, indicating that mining activities have not had an adverse impact on receiving water quality. Moreover, observed concentrations were not elevated during either mining or decommissioning and reclamation relative to reference concentrations, with the exception of arsenic on Pacific Creek, leading to the conclusion that the impact to the Pacific Creek and Lee Creek receiving environments is negligible even relative to background (which is generally lower than CCME). Only arsenic in Pacific Creek was observed to have increased above reference.

No notable changes in water quality were observed in Pacific and Lee Creeks during 2015. In general, results were below CCME guidelines with the exception of selenium, a parameter that has not been observed at concentrations lower than CCME at any point in the mine's history.

3.1.3 Laura and Carolyn Creeks

Seven stations have been established on Laura and Carolyn Creek watersheds, as shown on Table 3-3. Six of these are located on Laura Creek, and one on Carolyn Creek. Monitoring of stations BC-01, BC-02 and BC-03 began in 1991, before the commencement of mining. As a result of impacts observed in the Lower portion of Laura Creek during mining and at the start of decommissioning and reclamation, a program was established to assess water quality in the Lower Laura Creek system. This program used additional stations established in the lower portion of the creek, including BC-37, BC-53 and BC-39. Only BC-39 has been analyzed in this assessment.

Table 3-3 Water Quality Monitoring Stations on Carolyn and Laura Creeks

Stations on Carolyn Creek and Laura Creek		Included in Assessment
BC-32	Laura Creek below Exploration Camp	No
BC-03	Laura Creek above confluence w/ Carolyn Creek	Yes
BC-01	Laura Creek 50m u/s Ditch Road	Yes
BC-37	Laura Creek @ Ditch Road	No
BC-53	Laura Creek 50m d/s Ditch Road	No
BC-39	Laura Creek in the side channel of South Klondike River	Yes
BC-02	Carolyn Creek before confluence with Laura Creek	Yes

3.1.3.1 Observations: Selenium

High MDLs for selenium complicated analysis of results obtained on Laura and Carolyn Creeks (as was the case for Lee and Pacific Creeks), especially prior to mining. However, higher results (>MDL) observed in Carolyn Creek after 2003 allowed analysis of selenium at least on that stream, as shown on Figure 3-8. On Laura Creek however, results were often at or near the detection limit, making interpretation of the results difficult.

Another factor related to the MDL that influenced interpretation of water quality was that the SSWQS established during the previous 1996 water licencing process was only slightly less than four times the typical MDL. A Practical Quantitative Limit (PQL) of five times the MDL is considered prudent in assessing water quality results, although a PQL of three times the MDL is sometimes used.

Carolyn Creek saw the greatest increase in selenium concentrations over the study period, reaching over 0.03 mg/L in August 2004, and nearly as high on several other occasions between 2005 and 2008, at which point concentrations decreased. During the decommissioning and reclamation phase at Brewery Creek, Carolyn Creek exceeded the SSWQO for selenium in 48% of samples, compared with only 6% during mining, and 14% prior to mining.

During the period between 2005 and 2008, upstream concentrations of selenium on Laura Creek were occasionally higher than the SSWQO, reaching 0.006 mg/L on one occasion at BC-01. These results drove values up in the downstream reaches of Laura Creek at BC-39 as well. In June 2007 during the spring freshet, BC-39 reached as high as the site-specific standard of 0.0038 mg/L. These higher concentrations however have abated more recently (since 2008).

Despite an observed increase in selenium concentrations on Laura Creek, results were rarely in excess of the SSWQO, and in no cases exceeded the standard >10% of the time at any station on Laura Creek (BC-01, BC-03 and BC-39). Nonetheless, selenium is regarded as a contaminant of concern within the Carolyn and Laura Creek watershed as a result of the observed high concentrations of selenium in Carolyn Creek relative to background conditions, and the earlier need to establish an SSWQO for this area.

The 2015 results were below the site specific objective. BC-01, BC-02, and BC03 were above CCME, but were within the trend that had been observed throughout mine life.

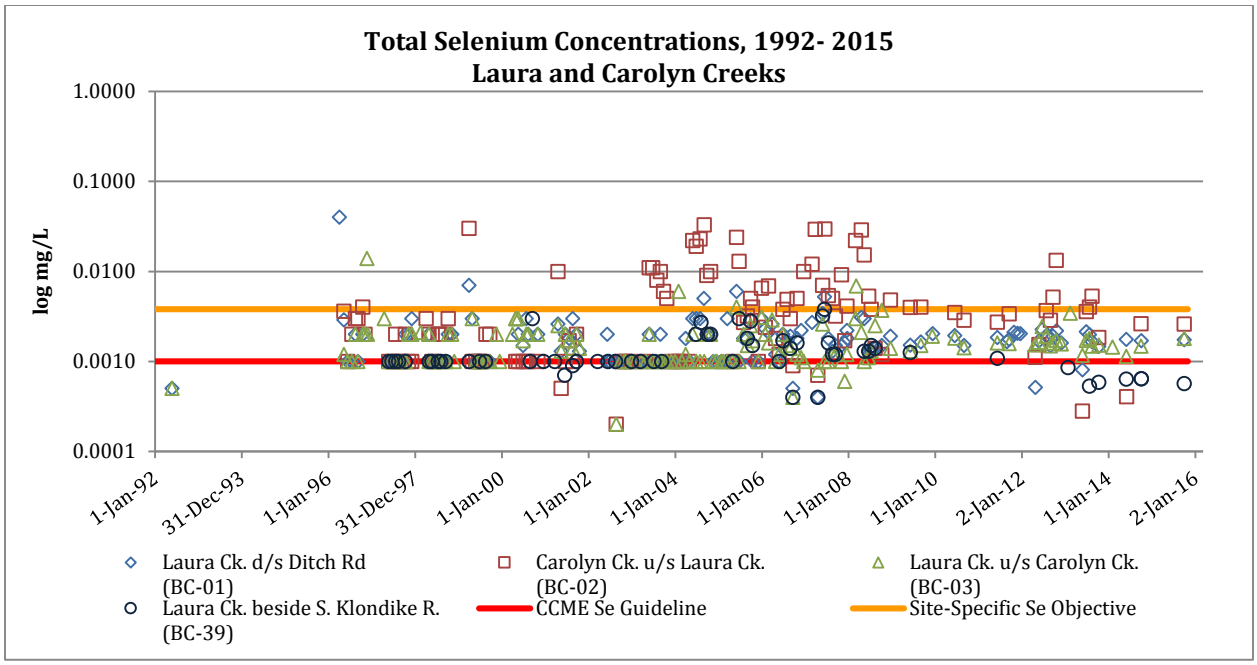


Figure 3-8 Selenium Concentrations on Laura and Carolyn Creeks (1992 – 2015)

3.1.3.2 Observations: Arsenic

Arsenic results were not affected by high MDLs. The results show that arsenic concentrations rose in the Laura and Carolyn Creek watersheds primarily after the start of mining; however, the limited background dataset for these sites makes comparison with background benchmarks tenuous[3].

Arsenic concentrations did not show a specific trend for any sites, but all four stations analyzed have exceeded the CCME guideline in the past, as shown on Figure 3-9. At BC-01, arsenic exceeded the CCME guideline in >50% of results during production and decommissioning and reclamation, but only exceeded CCME 20% of the time prior to mining. At BC-02 and BC-03, arsenic was in excess of CCME >10% of the time both during production and decommissioning and reclamation, and exceeded CCME more commonly during mining and reclamation than it did prior to mining. At BC-39, which is a compliance point with respect to CCME guidelines, arsenic exceeded the guideline 5% of the time during mining, and 13% of the time during decommissioning and reclamation.

There were no exceedances of the CCME guideline recorded during the 2014 or 2015 monitoring events.

[3] *A pooled reference dataset may produce a more robust background benchmark for the Laura Creek watershed.*

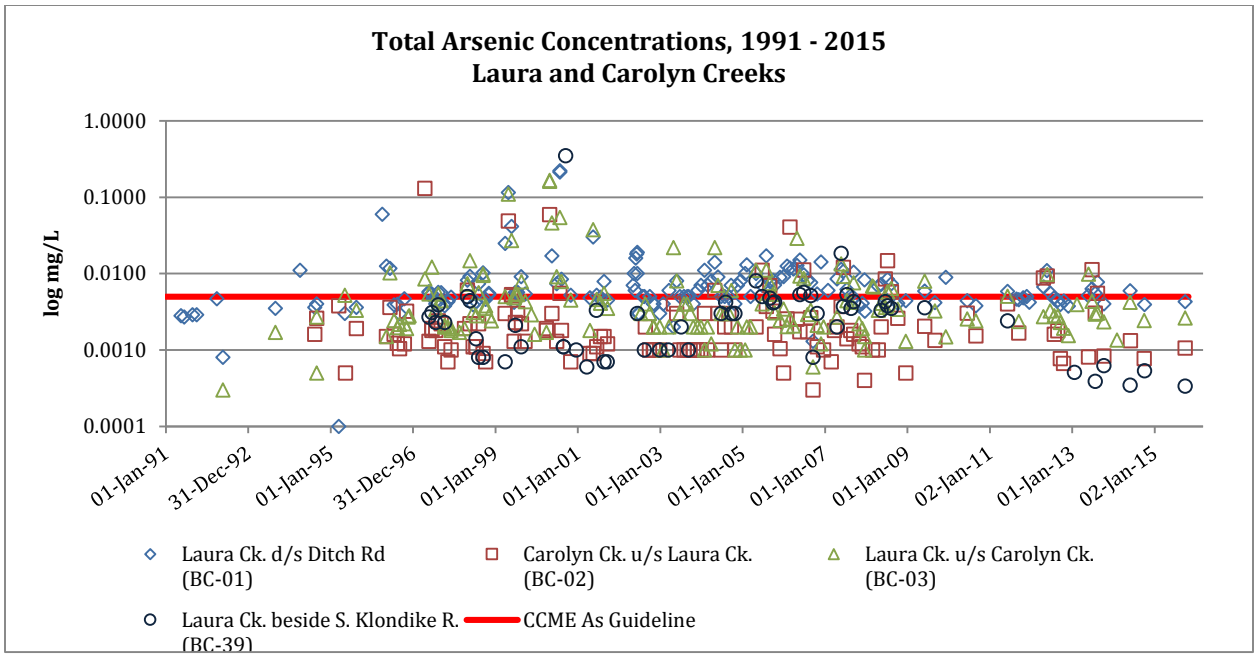


Figure 3-9 Arsenic Concentrations on Laura and Carolyn Creeks (1991 – 2015)

3.1.3.3 Observations: Zinc

Like arsenic, the zinc dataset was not impacted by high MDLs and zero values. Relative to the arsenic time series for these sites, zinc exceeded CCME with significantly lower frequency. Although zinc values spiked somewhat during production, Figure 3-10 shows a bimodal distribution where zinc again peaks after 2005. The June 2004 fire in the Carolyn and Laura Creek watersheds may have increased the availability of soils containing some zinc for erosion into river waters. In the absence of dissolved zinc concentrations with which to compare the total zinc results, it is difficult to confirm.

There were no exceedances of the CCME guideline during the 2014 or 2015 sampling events.

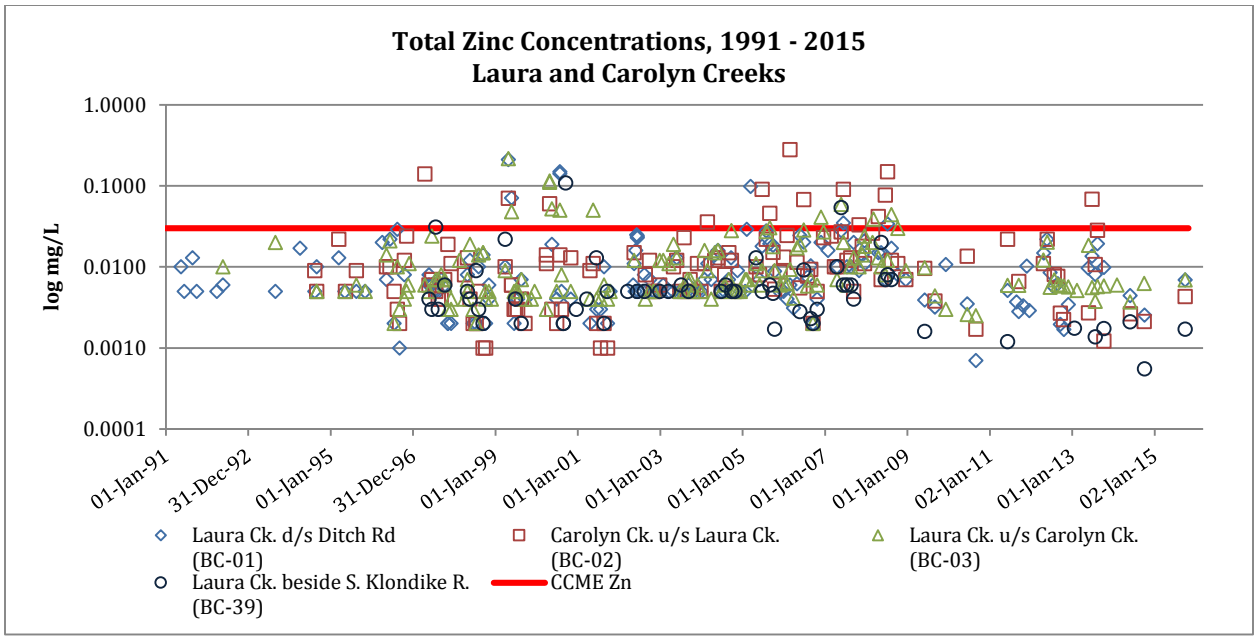


Figure 3-10 Zinc Concentrations on Laura and Carolyn Creeks (1991 – 2015)

3.1.3.4 Observations: Copper

Copper results show variation about the CCME guideline, but do not exhibit any specific trend, as shown on Figure 3-11. All upstream stations (BC-01, BC-02 and BC-03) show copper results exceeding the CCME guideline >10% of the time during all phases (pre-mine, production, and decommissioning and reclamation).

Results indicate that copper has not become a concern in the Laura Creek watershed as a result of mining. There were no exceedances of the CCME Copper guideline in 2015.

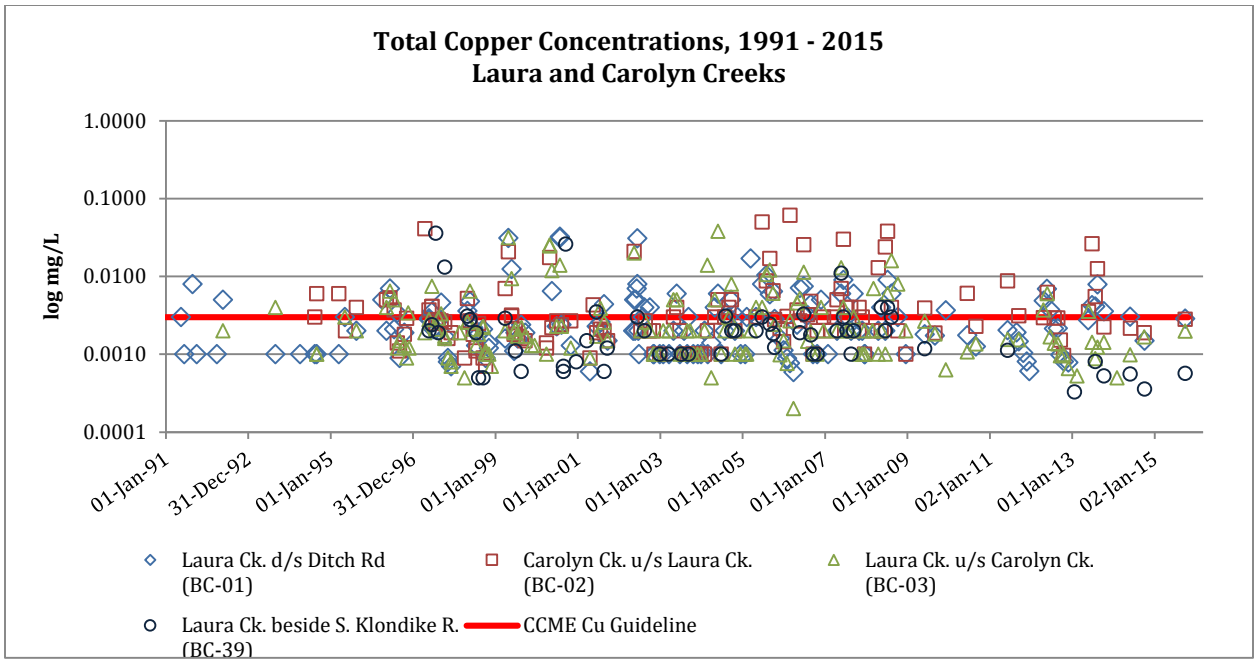


Figure 3-11 Copper Concentrations on Laura and Carolyn Creeks (1991 – 2015)

3.1.3.5 Observations: Total Suspended Solids

Results for total suspended solids (TSS) require a closer examination because this parameter often exhibits a seasonal pattern during high and low flow periods. On Figure 3-12, all points occurring over the reference TSS value[4] of 33 mg/L occurred during the summer months, especially during May and June, at the spring freshet.

[4] *The reference TSS value for this dataset is a simple pooled mean calculation of all available data for Laura and Carolyn Creeks.*

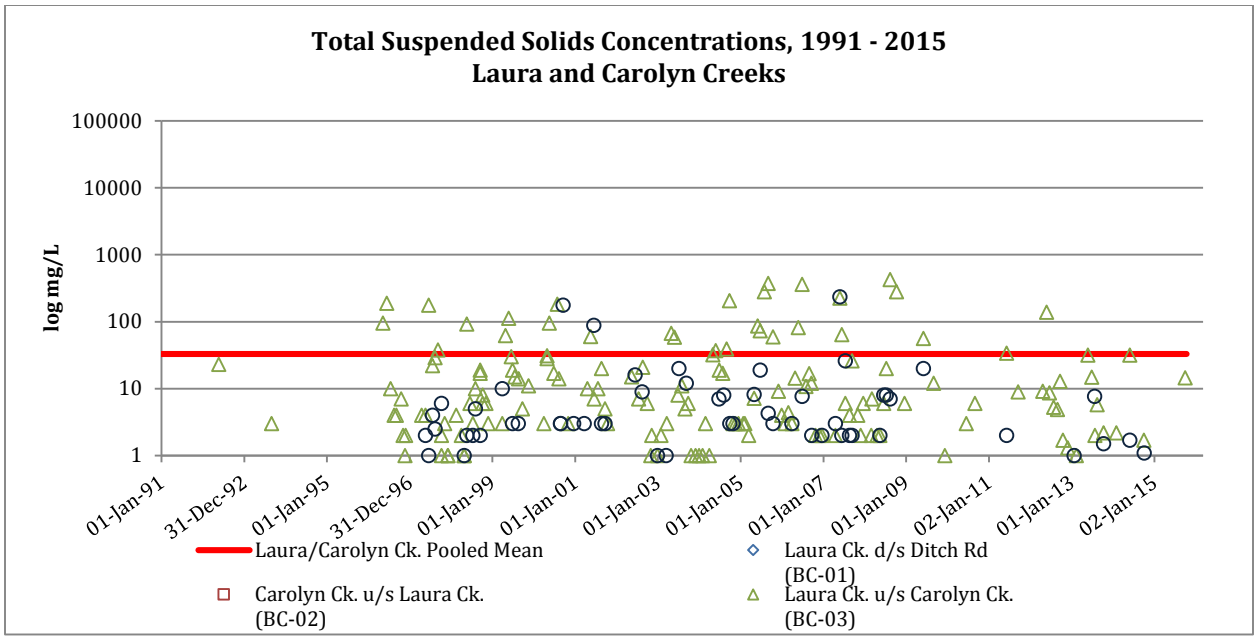


Figure 3-12 Total Suspended Solids Concentrations on Laura and Carolyn Creeks (1991-2015)

3.1.3.6 Observations: Nitrate

As mentioned in Section 3.1.2.5, in 2004 a fire occurred at the Brewery Creek Mine within the Laura and Carolyn Creek watersheds which likely had an impact on the amount of nitrate observed here. Perhaps more significant, however, was the release of detoxified heap solution in 2002 and 2003 to the Laura Creek watershed. These releases and later free-draining of the heap would have resulted in an increase in nitrate availability to the Carolyn and Laura Creek systems. Figure 3-13 shows just such an increase in Carolyn Creek, beginning in September 2002.

In 2002, the Laura and Carolyn Creek watersheds also saw the implementation of an evapo-transpiration cover over the Blue Waste Rock Storage Area and Heap Leach Pad, as a part of the decommissioning and closure effort. These covers require the application of fertilizers to facilitate plant growth. Fertilizers can have an impact on surface waters as nutrients dissolve into runoff and are carried into the downstream environment, and could be a source of nitrates here.

Nitrate concentrations rose starkly in Laura and Carolyn Creeks in the years following release of detoxified heap solution, implementation of the waste rock and heap leach covers, and the forest fire. Figure 3-13 shows that these watersheds are still absorbing the effects of increased nitrogen inputs, as evidenced by sustained high nitrate concentrations. Samples collected in 2015 were below the CCME guideline.

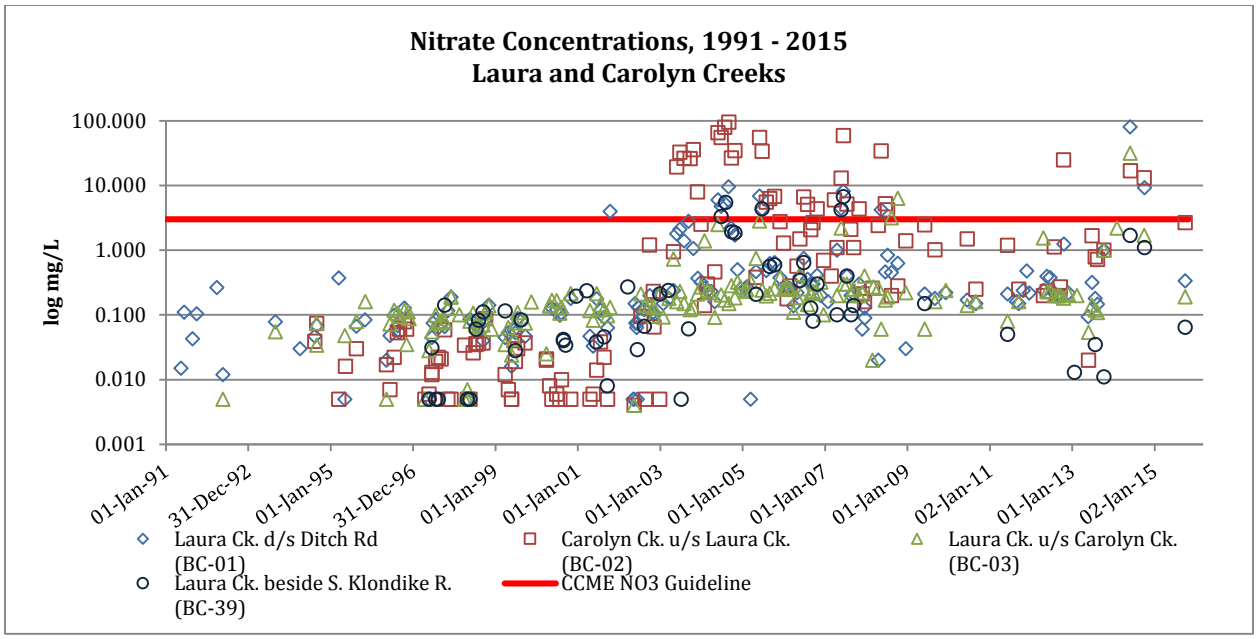


Figure 3-13 Nitrate as Nitrogen Concentrations on Laura and Carolyn Creeks (1991-2015)

3.1.3.7 Conditions during Production and Decommissioning and Reclamation

Of all parameters assessed for the production and decommissioning and reclamation periods, the most problematic appeared to be arsenic and nitrate, with selenium to a lesser extent, followed by zinc. The mechanisms causing the issues with each of these parameters differ in origin and spatial distribution.

Arsenic, as discussed, exceeded CCME at all sites and over most phases of mining and decommissioning and reclamation. Copper exceeded the CCME guideline in >10% of samples for all sites and during all periods, but was higher than the CCME guideline prior to the start of mining in 1996. Zinc did not generally pose a significant risk, and elevated values may be associated with environmental conditions caused by the 2004 fire. Nitrate concentrations were also elevated during decommissioning and reclamation as a result of the combined influences of released detoxified heap solution, implementation of the waste rock and heap leach covers, and the 2004 forest fire.

Selenium has an elevated SSWQO to reflect conditions associated with the natural mineralogy of the area and mining activities. Results have consistently met this objective at the compliance station BC-39.

Additional parameters antimony and lead are presented graphically in Appendix B for Laura and Carolyn Creeks.

3.1.4 South Klondike River

3.1.4.1 Observations

Datasets for the South Klondike River were affected to a considerable degree by data at or near the MDL, particularly for the early years of monitoring. Data collected from the South Klondike River generally tended to be lower than data collected elsewhere on the property for all parameters. While this drove the issues associated with MDL interference, the very fact that so many reportable results occurred below both CCME and reference reduced the concern associated with the data removal. It is likely for values less than problematic MDLs that these results were also below the guidelines, based on the data trends observed in the graphs contained in Appendix B.

No trends indicating increased concentration of parameters of concern have been observed in the South Klondike River as a result of mining activities at the Brewery Creek Mine during 1996 – 2000. Moreover, no appreciable effects have been observed during the significant period of decommissioning and reclamation activities at the mine. However, nitrate has been steadily rising in the watershed as nutrient-rich runoff from the burn area of the forest fire makes its way into the South Klondike River.

3.2 GROUNDWATER QUALITY

Like surface water monitoring, groundwater monitoring at Brewery Creek has transitioned to the post-closure phase, which involves twice-annual monitoring of groundwater monitoring piezometers where conditions allow. These events are typically conducted during or shortly following freshet, in May or June, and again in September or October, during low-flow conditions. The amount of environmental monitoring at BC-19, BC-21, BC-22, BC-65 and BC-66 has reduced in frequency since closure of the heap has been accomplished and the drain down solutions treated. Similarly, since closure of the Blue Waste Rock Storage area has been achieved, monitoring at stations BC-67, BC-68 and BC-69 has been reduced. Piezometers located at stations BC-20, BC-23, BC-24, BC-25 and BC-26 were removed from license QZ96-007 in Amendment #8 and are therefore no longer required to be monitored.

3.2.1 Heap Pad Groundwater Monitoring

Monitoring at stations BC-19, BC-21 and BC-22 showed no sign of increasing or decreasing trends for most metals, total and WAD cyanide, nitrate or ammonia. Antimony levels appear to have decreased slightly in 2012 to 2014, but this trend will have to be confirmed with continued monitoring. At BC-21, arsenic levels appear to be slightly higher in 2012-2014 than the average for the decommissioning and reclamation period, but are not as high as during production. Data are presented graphically in Appendix C. Note that where results were below the MDL, half of the MDL was used in the graphs. Although WAD and total cyanide concentrations appear to be decreasing, this is an artefact of lower MDLs in the recent years.

3.2.2 Land Application Area Groundwater Monitoring

Monitoring at station BC-66 showed no sign of increasing or decreasing trends for most metals, total and WAD cyanide, nitrate or ammonia. With the exception of dissolved antimony and arsenic levels at BC-66 which have been showing a lower levels from 2013 to 2015. All results were in compliance with respect to Clause 43 of Water Licence QZ96- 007. BC-65 appears to be blocked or frozen and could not be sampled. Data are presented graphically in Appendix C.

3.2.3 Blue WRSA Groundwater Monitoring

Monitoring at stations BC-67and BC-69 showed no sign of increasing or decreasing trends for metals, total and WAD cyanide, nitrate or ammonia. The exception is BC-69 which has a decreasing dissolved selenium over time. Monitoring could not be carried out at Blue WRSA stations BC-68 and BC-70 during 2013. Attempts to sample these locations will continue in future years. Data are presented graphically in Appendix C.

3.3 IN-PIT WATER QUALITY

Mined out pits were used effectively as sediment control basins during operations and mine decommissioning. Snow melt and precipitation run-off is directed to the closest inactive pit. Pit samples are taken from surface standing water within each pit in 2015.

- BC-10: Kokanee Pit and Dump
- BC-12: Blue Pit
- BC-15: Moosehead Pit
- BC-16: Pacific Gulch (typically dry)
- BC-17: Golden Pit and Dump
- BC-18N: Lucky Pit and Dump (north side)
- BC-51W: Pacific Pit (west side)

The following points highlight pit water characteristics:

- Water that is contained in all pits either exfiltrates or evaporates.
- Neither the Pacific nor Blue Pits discharge to surface waters; water infiltrates through the pit bottoms.
- Although the Blue Pit (BC-12) exhibited relatively low pH values in 2012 (4.85 in June), pH values obtained during the 2015 sampling were neutral (7.35 October). These pH values are considerably

higher than historic (mining) results in the Blue Pit and suggest pit chemistry is stable and not trending towards any ARD concerns. pH levels in Pacific Pit (BC-51W) however have been consistently low since 2008.

- Previous years' sampling in Moosehead (BC-15) showed higher levels of selenium. This trend reversed beginning in 2009, and selenium levels in Moosehead from 2009-2015 continued to be below 0.05 mg/L, with a result of 0.019 mg/L in 2015.

Overall, the results of pit water sampling indicate no upward trends from previous years.

3.4 HEAP EFFLUENT WATER QUALITY

In 2015, no water was discharged into the receiving environment via direct discharge or land application from the over flow pond, heap discharge pond, or the Biological Treatment Cell. The associated samples sites (BC-28, 28a, and 28b) were sampled in October 2015 but were not compared to the effluent quality standards provided in Water License QZ96-007 Clauses 42 and 44 because there was no discharge.

4 SUMMARY

- No contaminants of concern have been identified for Lucky, Golden, Lee and Pacific Creeks.
- Selenium concentrations in Laura and Carolyn Creeks rose several years after land application of the heap effluent. The land application system ceased operations in 2000, while concentrations of selenium in the environment began rising in Carolyn Creek in 2003, and in Laura Creek in 2004 but have been generally lower since 2009.
- The fire had a significant impact on some parameters in Laura and Carolyn Creeks. The fire also had an impact on at least nitrate nitrogen in Lee and Pacific Creeks, as well as slowly impacting the South Yukon River.
- Background concentrations exceeded CCME in some parameters (e.g. BC-34) which supports the need for site specific water quality objectives at some sites, rather than a blanket approach to regulation.
- The South Klondike River achieved CCME or better in 99% of samples collected over all three periods (pre-mining, production and decomissioning). No impacts have been observed in the river as a result of mining activities at the Brewery Creek Mine during 1996 – 2000. Moreover, no effects have been observed during the period of decommissioning and reclamation activities at the mine from 2000 – 2015.

5 REFERENCES

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APPENDIX A

2015 TABULAR DATA

Brewery Creek Mine Annual Report 2015 - Surface Water Monitoring

Station Name			BC-01	BC-02	BC-03	BC-04	BC-05	BC-06	BC-10	BC-12	BC-15
Description		CCME-Aquatic	Laura Creek, 50m u/s from Ditch Road	Carolyn Creek, u/s from Laura Creek	Laura Creek, above confluence w/ Carolyn Creek	Lucky Creek d/s of Lucky Pit	Pacific Creek u/s from confluence w/ Lee Creek	South Klondike R. d/s from confluence w/ Lee Creek	Kokanee Pit and Dump	Blue Pit	Moosehead Pit discharge
Smpl Date		Life	2015-09-29	2015-09-29	2015-09-29	2015-09-29	2015-09-29	2015-09-29	2015-09-30	2015-09-30	2015-09-30
Discharge (Flow)	L/s		210.6	20.7	171.3	56.8	224.8				
StaffGauge Reading/Water Level	m		0.624				0.323				
pH (field)	pH units	6.5-9	8.06	7.84	8.03	7.75	7.96	7.81	8.39	7.35	8.08
pH (lab)	pH units	6.5-9	8.05	7.87	8.03	8.11	8.09	8	8.16	7.72	8.07
Specific Conductivity (field)	µS/cm		368.3	367.8	379.7	534.4	404.9	274	425.4	923	891
Conductivity (lab)	µS/cm		392	396	404	572	436	292	460	983	953
Temperature (field)	C		1.6	1.9	1.7	1.2	1.2	3.4	3.4	4.3	4.1
Hardness (from dissolved)	mg/L		204	182	214	298	226	149	249	507	571
Alkalinity, Total	mg/L		106	65.5	109	132	116	86.3	134	159	125
Total Dissolved Solids	mg/L		274	260	258	366	302	178	310	718	732
Total Suspended Solids	mg/L		44.4	84	14.6	32.5	2.5	1.9	1.3	5.8	1.6
Chloride	mg/L	120	1.2	1.2	0.96	0.8	0.91	0.72			
Sulphate, Dissolved	mg/L		106	116	100	175	111	56.8	111	397	389
Ion Balance	N/A		0.98	1	1	0.96	0.99	1			
Ammonia Total	mg/L	0.197	0.014	0.036	0.013	0.021	0.011	0.0094	0.0071	0.023	0.018
Nitrate, as N	mg/L	3	0.335	2.68	0.191	0.182	0.0629	0.0773	<0.0020	0.0157	0.0248
Cyanide, Total	mg/L		<0.00050	0.00088				<0.00050			
Cyanide, Weak Acid Dissociable	mg/L	0.005	<0.00050	<0.00050				<0.00050			
Silver (Ag), Total	mg/L	0.00025	0.000013	0.000015	<0.0000050	<0.0000050	0.000008	<0.0000050	<0.0000050	<0.0000050	0.00001
Aluminum (Al), Total	mg/L	*	0.588	0.759	0.139	0.305	0.0614	0.0123	0.0757	0.364	0.101
Arsenic (As), Total	mg/L	0.005	0.00429	0.00106	0.00262	0.00339	0.00058	0.000547	0.0177	0.336	0.0571
Barium (Ba), Total	mg/L		0.0852	0.0964	0.06	0.0736	0.0592	0.0528	0.139	0.0374	0.0563
Beryllium (Be), Total	mg/L		0.000057	0.000046	0.000045	0.000021	0.000014	<0.000010	<0.000010	0.00102	<0.000010
Bismuth (Bi), Total	mg/L		<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B), Total	mg/L	1.5	<0.050	<0.050	<0.050	<0.050	<0.050	<0.010	<0.010	0.018	<0.010
Calcium (Ca), Total	mg/L		48.6	40.5	53.3	72.5	56.6	39.9	60.5	140	126
Cadmium (Cd), Total	mg/L	*	0.000074	0.000037	0.000064	0.000192	0.000062	0.000036	0.000041	0.00137	0.000026
Cobalt (Co), Total	mg/L		0.00153	0.00795	0.00068	0.000817	0.000092	0.000034	0.000043	0.0151	0.000042
Chromium (Cr), Total	mg/L	0.001	0.00119	0.00126	<0.00050	0.00065	0.00216	<0.00010	0.00011	<0.00010	0.00019
Copper (Cu), Total	mg/L	*	0.00288	0.00282	0.00199	0.00179	0.00231	0.000725	0.000402	0.00841	0.000354
Iron (Fe), Total	mg/L	0.3	1.02	1.23	0.293	0.917	0.154	0.0381	0.0508	1.16	0.0496
Mercury (Hg), Total	mg/L	0.000026	<0.0000020	0.0000027	<0.0000020	<0.0000020	0.0000056	<0.0000020	0.0000037	0.0000029	<0.0000020
Potassium (K), Total	mg/L		1.14	0.97	1.22	1.27	0.63	0.508	1.7	1.97	1.1
Lithium (Li), Total	mg/L		0.00978	0.00814	0.0105	0.00836	0.00339	0.00245	0.00371	0.00749	0.00142
Magnesium (Mg), Total	mg/L		18.6	17	20.3	29.6	21.9	12.3	25.8	50.4	63.8
Manganese (Mn), Total	mg/L		0.0664	0.079	0.0508	0.0843	0.0156	0.00763	0.0264	0.662	0.0062
Molybdenum (Mo), Total	mg/L	0.073	0.0024	0.000288	0.00217	0.00199	0.00256	0.000592	0.00404	0.0142	0.00106
Sodium (Na), Total	mg/L		3.67	9.43	2.7	2.14	1.8	2.05	0.84	1.09	0.471
Nickel (Ni), Total	mg/L	*	0.00392	0.00261	0.00404	0.00446	0.00484	0.00089	0.000593	0.0458	0.000772
Lead (Pb), Total	mg/L	*	0.000602	0.000794	0.00014	0.00043	<0.000050	0.000029	0.000128	0.000027	0.000167
Phosphorous (p), Total	mg/L		0.047	0.056	0.019	0.031	0.013	0.0028	0.0062	0.0093	0.0047
Antimony (Sb), Total	mg/L		0.00329	0.000862	0.00413	0.0033	0.000537	0.000172	0.11	0.181	0.00427
Selenium (Se), Total	mg/L	0.001	0.00174	0.00261	0.0018	0.00378	0.00184	0.00082	0.00548	0.00126	0.0193
Silicon (Si), Total	mg/L		5.82	6.74	4.78	4.99	4.11	2.91	1.56	5.8	2.16
Tin (Sn), Total	mg/L		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Strontium (Sr), Total	mg/L		0.226	0.129	0.259	0.435	0.213	0.222	0.48	0.843	1.16
Sulphur (S), Total	mg/L		31	38	33	57	36	21.3	36.6	127	138
Tellurium, total	mg/L										
Thorium, total	mg/L										
Titanium (Ti), Total	mg/L		0.0214	0.0232	<0.0050	0.0125	<0.0050	<0.00050	0.00093	0.00109	0.00219
Thallium (Tl), Total	mg/L	0.0008	0.00001	0.000012	0.000005	0.000012	0.000003	<0.0000020	0.000063	0.000047	0.000047
Uranium (U), Total	mg/L	0.015	0.00171	0.000581	0.00167	0.00283	0.00144	0.000858	0.0102	0.0072	0.00447
Vanadium (V), Total	mg/L		0.00315	0.00318	0.00125	0.00258	0.0014	0.0003	0.00049	0.00039	0.00057
Zinc (Zn), Total	mg/L	0.03	0.0069	0.0043	0.0069	0.0112	0.0146	0.00274	0.0012	0.0896	0.00108
Zirconium (Zr), Total	mg/L		0.0004	0.00065	0.00024	0.00018	0.00078	<0.00010	0.0001	<0.00010	<0.00010

CCME Guideline for Aquatic life (first column) : Parameters which have resulst (or the detection limits) above the guideline flagged (in red) as exceedances
The * indicates the guideline is calculated based on pH (Al) or hardness (Cd, Cu, Pb, Ni)

Brewery Creek Mine Annual Report 2015 - Surface Water Monitoring

Station Name			BC-17	BC-28	BC-28a	BC-28b	BC-31	BC-34	BC-39	BC-51W	BC-53
Description		CCME-Aquatic	Golden Pit and Dump	Overflow Pond decant	Discharge from heap	Far (South) End of Biological Treatment Cell	Golden Creek above confluence w/ South Klondike R.	Lee Creek at Ditch Road	Laura Creek in side channel of South Klondike R.	Pacific Pit - west side	Lower Laura Creek 50m d/s of Ditch Road
Smpl Date		Life	2015-09-30	2015-10-01	2015-10-01	2015-10-01	2015-09-29	2015-09-29	2015-09-29	2015-09-30	2015-09-29
Discharge (Flow)	L/s						1123.4	3410.9	3.8		202.3
StaffGauge Reading/Water Level	m						0.597				
pH (field)	pH units	6.5-9	7.94	7.84	7.89	8.04	8.16	8.1	7.48	3.84	7.97
pH (lab)	pH units	6.5-9	8.03				8.13	8.1	7.94	3.69	8.07
Specific Conductivity (field)	µS/cm		362.8	109	3448	2777	429.8	400.7	252.2	696.3	363.4
Conductivity (lab)	µS/cm		390				469	436	273	723	393
Temperature (field)	C		2.3	2.8	3.8	4.7	1.2	2.9	4.5	4.7	1.6
Hardness (from dissolved)	mg/L		199	47.8	1300	898	253	236	132	305	206
Alkalinity, Total	mg/L		121				137	122	79.7	<0.50	102
Total Dissolved Solids	mg/L		250				332	296	156	494	276
Total Suspended Solids	mg/L		<1.0	3.7	1.5	1.4	3.4	3.3	<1.0	3	15
Chloride	mg/L	120					0.68	0.76	0.67	<0.50	0.76
Sulphate, Dissolved	mg/L		84.8				104	102	54.3	311	91
Ion Balance	N/A						1	1	1	1.1	1.1
Ammonia Total	mg/L	0.197	0.0099	0.011	0.012	0.12	0.015	0.02	0.0099	0.011	0.017
Nitrate, as N	mg/L	3	1.15				0.243	0.15	0.0643	<0.0020	0.326
Cyanide, Total	mg/L			<0.00050	0.434	0.0603	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Cyanide, Weak Acid Dissociable	mg/L	0.005		<0.00050	0.0355	0.0474	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Silver (Ag), Total	mg/L	0.00025	<0.0000050	0.000022	0.000005	0.000007	0.000006	<0.0000050	<0.0000050	0.000026	0.000007
Aluminum (Al), Total	mg/L	*	0.00501	1.79	0.0696	0.0394	0.0516	0.0388	0.00296	5.1	0.215
Arsenic (As), Total	mg/L	0.005	0.0461	0.0028	0.338	0.175	0.000588	0.000266	0.000335	0.0174	0.0034
Barium (Ba), Total	mg/L		0.106	0.171	0.0325	0.0389	0.059	0.0454	0.0751	0.0384	0.0663
Beryllium (Be), Total	mg/L		<0.000010	0.000043	0.000033	<0.000010	0.000015	<0.000010	<0.000010	0.0128	0.000037
Bismuth (Bi), Total	mg/L		<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000020	<0.000020	<0.0000050	<0.0000050	<0.000020
Boron (B), Total	mg/L	1.5	<0.010	0.015	0.014	<0.010	<0.050	<0.050	<0.010	0.012	<0.050
Calcium (Ca), Total	mg/L		55	12.2	366	250	56.5	56.7	37.6	63.9	49
Cadmium (Cd), Total	mg/L	*	0.000034	0.000011	0.000229	0.000055	0.000047	0.000092	0.000031	0.00393	0.000044
Cobalt (Co), Total	mg/L		0.000007	0.00155	0.481	0.392	0.0001	0.000059	0.000025	0.0511	0.00113
Chromium (Cr), Total	mg/L	0.001	0.00019	0.00193	0.00042	0.00023	<0.00050	<0.00050	<0.00010	0.00134	0.00068
Copper (Cu), Total	mg/L	*	0.000181	0.00188	0.00178	0.00222	0.00209	0.00174	0.00057	0.248	0.00227
Iron (Fe), Total	mg/L	0.3	0.0055	0.715	0.191	0.0571	0.13	0.0807	0.0053	5.89	0.435
Mercury (Hg), Total	mg/L	0.000026	<0.0000020	0.000004	0.0000338	0.0000133	0.0000029	0.0000026	<0.0000020	0.0000101	<0.0000020
Potassium (K), Total	mg/L		0.932	1.42	5.07	4.5	0.8	0.66	0.623	2.18	1.09
Lithium (Li), Total	mg/L		0.003	0.00318	0.00584	0.00405	0.00479	0.00221	0.00184	0.0125	0.00852
Magnesium (Mg), Total	mg/L		17.9	4.67	96.2	65.1	23.3	20.6	10.6	35	18.2
Manganese (Mn), Total	mg/L		0.00128	0.00485	0.0316	0.0223	0.0142	0.00843	0.000873	2.23	0.0452
Molybdenum (Mo), Total	mg/L	0.073	0.0086	0.000186	0.0193	0.0182	0.00142	0.00148	0.000678	0.000051	0.00229
Sodium (Na), Total	mg/L		1.36	4.98	378	312	1.72	1.31	2.25	0.828	3.58
Nickel (Ni), Total	mg/L	*	0.00181	0.00152	0.00762	0.00479	0.00217	0.00247	0.000438	0.151	0.00291
Lead (Pb), Total	mg/L	*	0.000026	0.000627	0.000021	0.000049	0.00007	<0.000050	0.000014	0.000166	0.000233
Phosphorous (p), Total	mg/L		0.0072	0.025	0.0461	0.0104	0.01	0.013	0.0036	0.008	0.022
Antimony (Sb), Total	mg/L		0.175	0.0104	1.88	1.38	0.000615	0.000268	0.000259	0.00305	0.003
Selenium (Se), Total	mg/L	0.001	0.0103	0.00035	0.164	0.11	0.0017	0.00211	0.000568	0.00409	0.00176
Silicon (Si), Total	mg/L		4.13	7.63	4.69	0.591	3.7	3.39	2.88	10.2	5.35
Tin (Sn), Total	mg/L		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Strontium (Sr), Total	mg/L		0.304	0.0718	1.82	1.25	0.28	0.23	0.205	0.428	0.23
Sulphur (S), Total	mg/L		25.3	5.4	383	231	34	35	18.5	108	31
Tellurium, total	mg/L										
Thorium, total	mg/L										
Titanium (Ti), Total	mg/L		<0.00050	0.0317	<0.00050	<0.00050	<0.0050	<0.0050	<0.00050	0.00063	0.0071
Thallium (Tl), Total	mg/L	0.0008	0.00006	0.000039	0.000319	0.000199	0.000005	0.000004	<0.0000020	0.000126	0.000005
Uranium (U), Total	mg/L	0.015	0.00688	0.000098	0.0344	0.0183	0.00211	0.00134	0.000765	0.00445	0.00166
Vanadium (V), Total	mg/L		0.00034	0.00396	<0.00020	0.00024	0.00115	0.0012	0.0003	0.00038	0.00187
Zinc (Zn), Total	mg/L	0.03	0.0142	0.0469	0.00712	0.00143	0.0049	0.0088	0.0017	0.401	0.0046
Zirconium (Zr), Total	mg/L		<0.00010	0.00234	<0.00010	<0.00010	0.00018	0.00011	<0.00010	<0.00010	0.00035

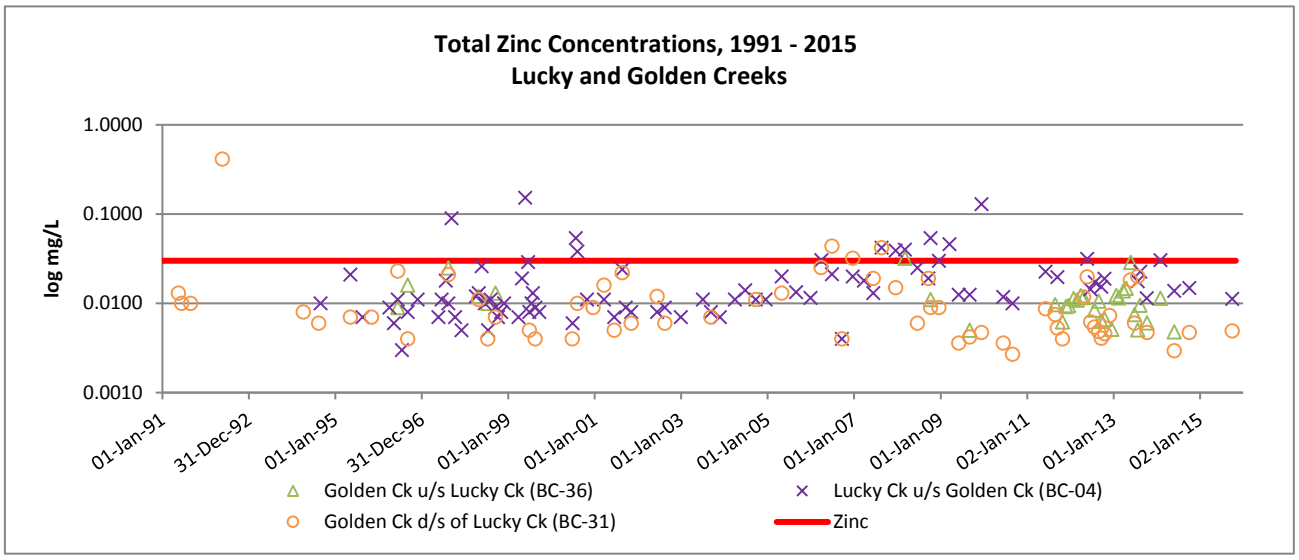
CCME Guideline for Aquatic life (first column) : Parameters which have resulst (or the detection limits) above the guideline flagged (in red) as exceedances
The * indicates the guideline is calculated based on pH (Al) or hardness (Cd, Cu, Pb, Ni)

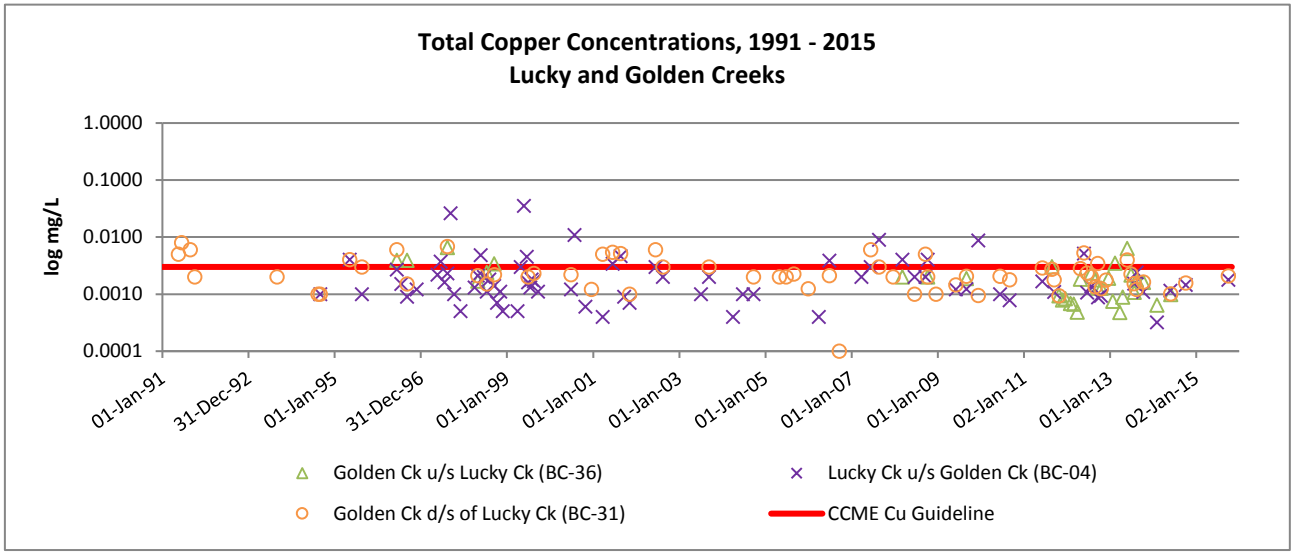
Brewery Creek Mine Annual Report 2015 - Groundwater Water Monitoring

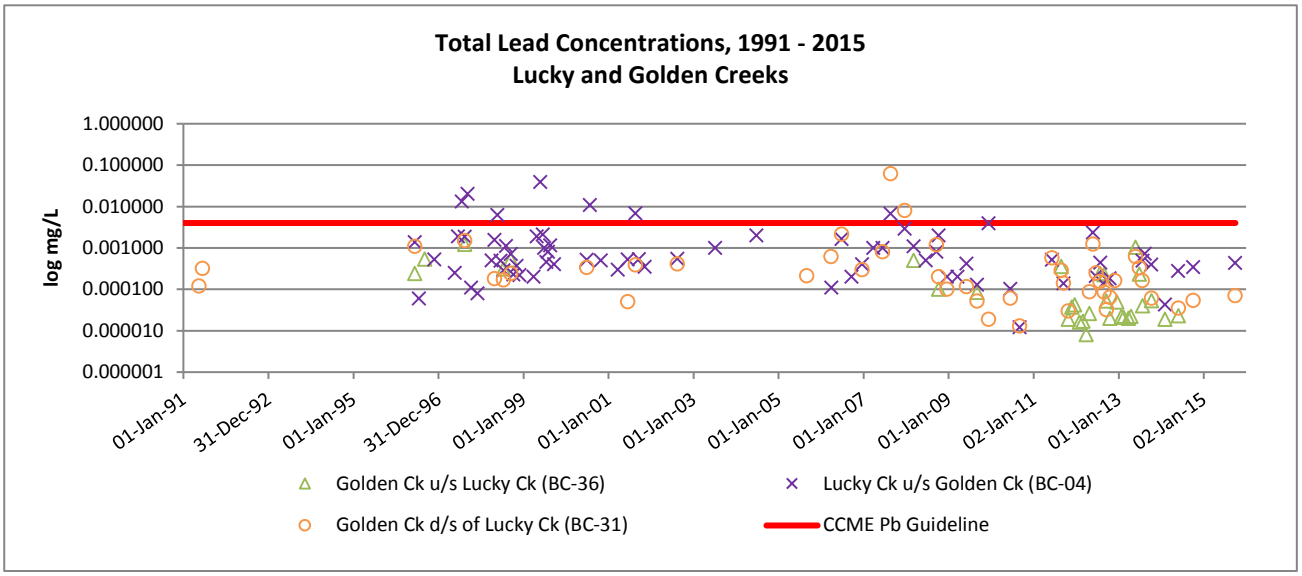
Station Name		BC-19	**BC-21**	**BC-22**	**BC-27**	**BC-65**	**BC-66**	**BC-67**	**BC-69**
Description		**Piezometer RC94-843**	**Piezometer RC95-1354**	**Piezometer RC95-1357**	**Piezometer RC97-2026**	**Land Application Piezometer**	**Land Application Piezometer (Deep Well)**	**Blue WRSA Piezometer**	**Blue WRSA Piezometer (Deep Well)**
Smpl Date		**01/10/2015**	**30/09/2015**	**01/10/2015**	**30/09/2015**	**01/10/2015**	**01/10/2015**	**30/09/2015**	**30/09/2015**
Discharge (Flow)	L/s								
StaffGauge Reading/Water Level	m								
pH (field)	pH units	6.48	6.19	6.07	7.76	5.92	7.75	6.66	7.07
pH (lab)	pH units	7.28	7.56	6.62	7.97	6.97	8.11	7.44	7.94
Specific Conductivity (field)	µS/cm	1083	1137	1247	763.5	96.5	667.2	368.7	727.3
Conductivity (lab)	µS/cm	1140	1300	1310	812	107	721	401	781
Temperature (field)	C	2.3	3.1	2.1	4.1	9	3.1	4.2	4
Hardness (from dissolved)	mg/L	665	627	749	461	45.6	350	179	436
Alkalinity, Total	mg/L	276	291	175	171	39.4	233	155	331
Total Dissolved Solids	mg/L	816	964	1050	584	66	454	220	462
Total Suspended Solids	mg/L								
Chloride	mg/L	0.78	2.3	2	0.88	1.4	5.1	6.8	2.1
Sulphate, Dissolved	mg/L	392	478	540	246	7.46	23	38.7	127
Ion Balance	N/A	1	0.83	1	1.1	0.99	1.1	0.89	0.96
Ammonia Total	mg/L	0.023	0.19	0.018	0.05	0.018	0.0079	0.022	0.027
Nitrate, as N	mg/L	0.334	<0.0020	6.7	0.0027	1.2	21.7	1.31	0.0029
Cyanide, Total	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00338	<0.00050	<0.00050
Cyanide, Weak Acid Dissociable	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00124	<0.00050	<0.00050
Aluminum (Al), Dissolved	mg/L	0.00252	0.00088	0.142	<0.00050	0.0085	0.00078	0.00164	0.00169
Antimony (Sb), Dissolved	mg/L	0.000188	0.000198	0.000048	0.00214	0.00347	0.000124	0.0668	0.00569
Arsenic (As), Dissolved	mg/L	0.000431	0.0225	0.000195	0.0652	0.000377	0.000181	0.00286	0.0394
Barium (Ba), Dissolved	mg/L	0.0023	0.0198	0.0203	0.0107	0.153	0.0506	0.183	0.0267
Beryllium (Be), Dissolved	mg/L	<0.000010	<0.000010	0.000088	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Bismuth (Bi), Dissolved	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B), Dissolved	mg/L	0.025	0.035	0.041	0.011	<0.010	<0.010	<0.010	<0.010
Cadmium (Cd), Dissolved	mg/L	0.000601	0.000035	0.00668	0.000023	0.000073	0.000012	0.000094	0.000913
Calcium (Ca), Dissolved	mg/L	149	132	181	113	12	70.4	45.7	82.3
Chromium (Cr), Dissolved	mg/L	0.00018	<0.00010	<0.00010	<0.00010	0.00086	<0.00010	<0.00010	<0.00010
Cobalt, Dissolved	mg/L	0.000618	0.00457	0.00425	0.000178	0.000194	0.0727	0.000883	0.000507
Copper (Cu), Dissolved	mg/L	0.000289	0.000201	0.000606	<0.000050	0.00404	0.00023	0.000252	0.000445
Iron (Fe), Dissolved	mg/L	0.0048	0.111	0.126	0.0277	0.0113	<0.0010	<0.0010	0.0014
Lead (Pb), Dissolved	mg/L	0.000013	0.000017	0.000022	0.000007	0.000013	0.000011	0.000009	0.000014
Lithium (Li), Dissolved	mg/L	0.0373	0.0372	0.0525	0.0102	0.00314	0.018	0.00511	0.00824
Magnesium (Mg), Dissolved	mg/L	71.4	72.2	72.3	43.1	3.82	42.3	15.7	55.9
Manganese (Mn), Dissolved	mg/L	0.289	1.92	0.334	0.224	0.00444	0.000365	0.0866	0.336
Mercury (Hg), Dissolved	mg/L	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020
Molybdenum (Mo), Dissolved	mg/L	0.000062	0.000273	0.000208	0.0122	0.000442	0.000178	0.000321	0.000312
Nickel (Ni), Dissolved	mg/L	0.00246	0.0066	0.0601	0.00204	0.0052	0.000393	0.0152	0.00321
Phosphorous (P), Dissolved	mg/L	0.0227	<0.0020	0.0575	<0.0020	0.037	0.0061	0.0257	0.0079
Potassium (K), Dissolved	mg/L	2.62	3.36	3.82	1.51	1.32	2.47	1.43	5.81
Selenium (Se), Dissolved	mg/L	0.00768	0.000237	0.0868	<0.000040	0.0027	0.0147	0.000078	0.000797
Silicon (Si), Dissolved	mg/L	7.41	5.57	15.5	4.06	6.97	4.62	4.7	2.96
Silver (Ag), Dissolved	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Sodium (Na), Dissolved	mg/L	11.3	8.15	20.6	1.77	2.4	10.8	2.29	1.87
Strontium (Sr), Dissolved	mg/L	0.519	0.494	0.426	0.767	0.0704	0.356	0.219	0.478
Sulphur (S), Dissolved	mg/L	142	137	192	98.6	<3.0	7.7	12.1	37.7
Tellurium, dissolved	mg/L								
Thallium (Tl), Dissolved	mg/L	0.000007	0.000026	0.000025	0.000004	0.000005	0.000011	0.000045	0.000278
Thorium, dissolved	mg/L								
Tin (Sn), Dissolved	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
Titanium (Ti), Dissolved	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Uranium (U), Dissolved	mg/L	0.000988	0.00293	0.000851	0.0131	0.000018	0.000963	0.00329	0.0037
Vanadium (V), Dissolved	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	0.00023	<0.00020	<0.00020	<0.00020
Zinc (Zn), Dissolved	mg/L	0.0268	0.136	0.133	0.026	0.0185	0.00175	0.0683	0.115
Zirconium (Zr), Dissolved	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010

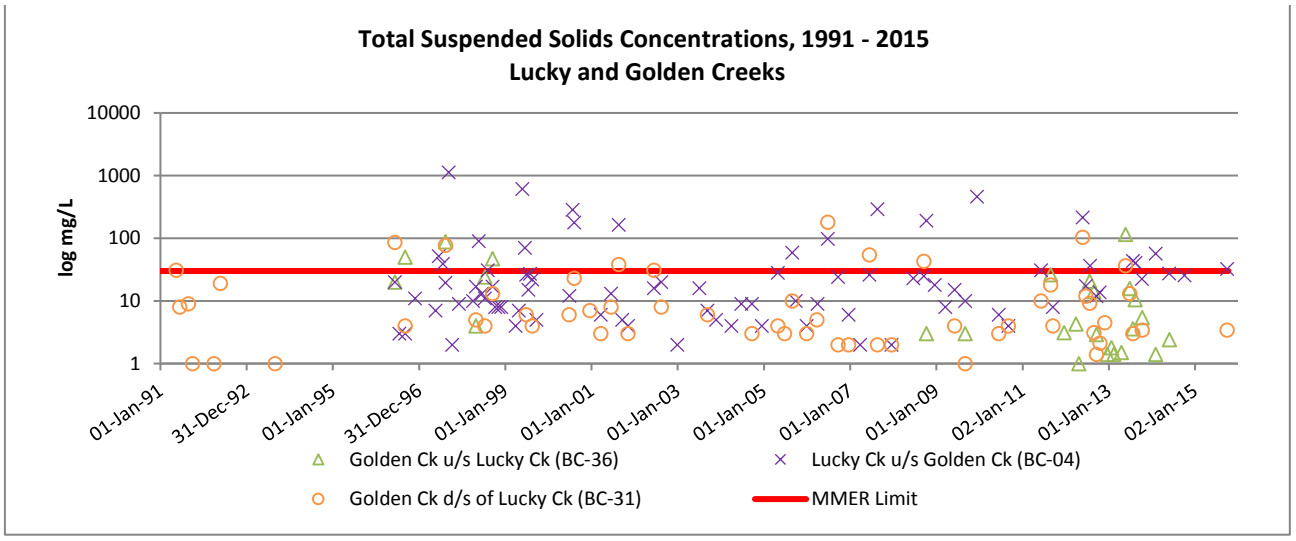
APPENDIX B

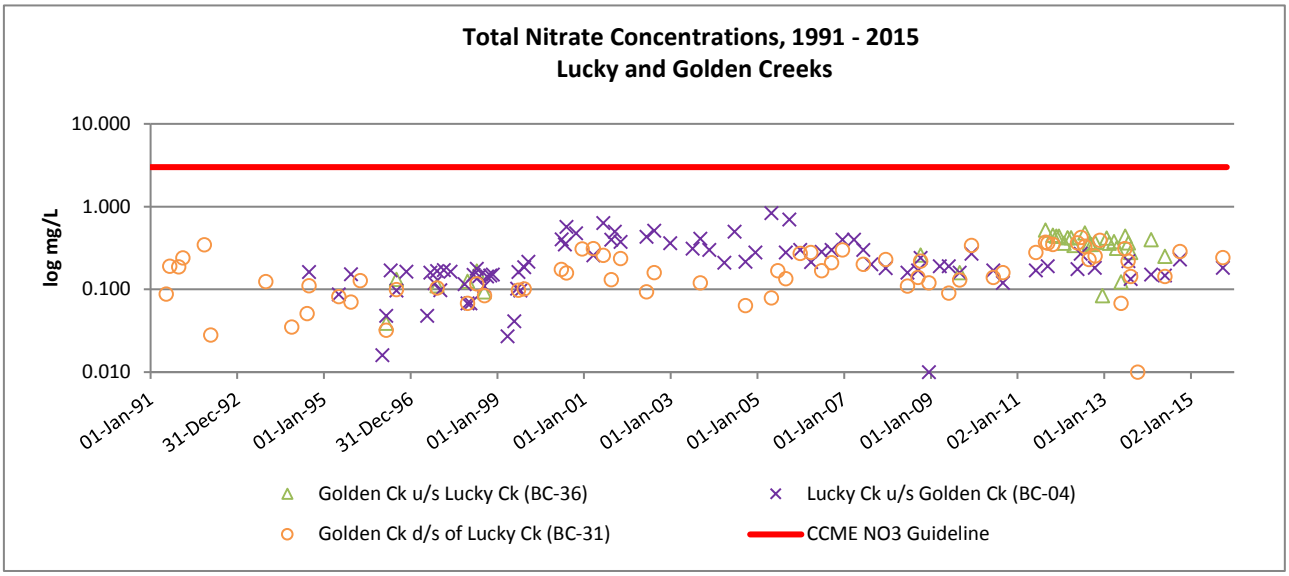
SURFACE WATER GRAPHICAL DATA

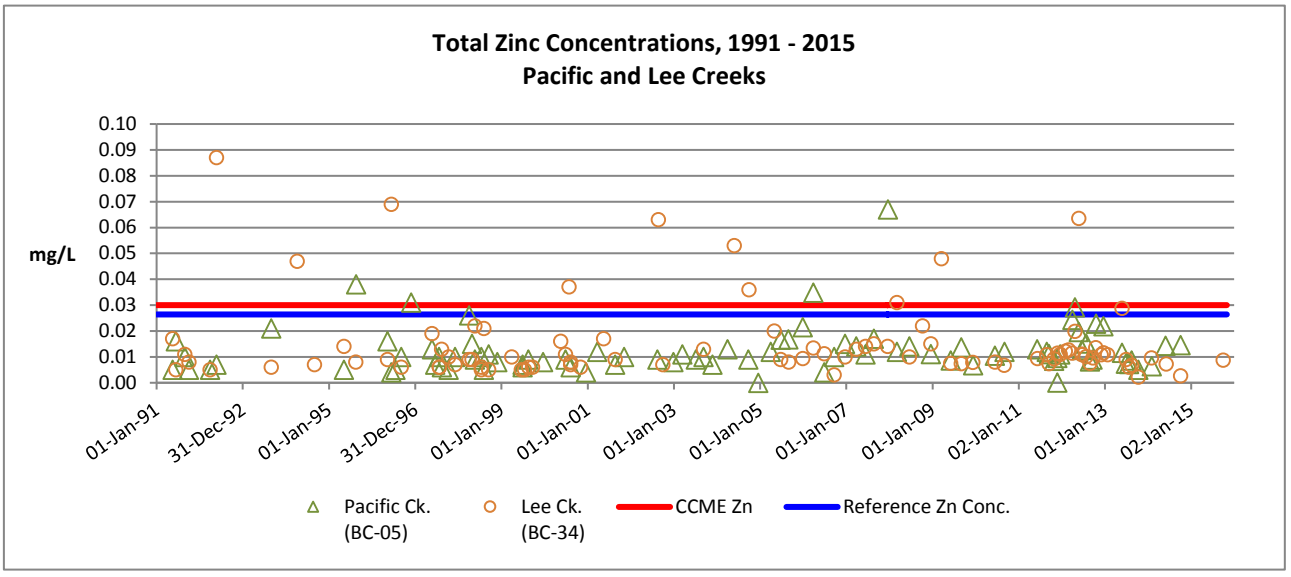

Total Zinc Concentrations, 1991 - 2015
Lucky and Golden Creeks
log mg/L
1.0000
0.1000
0.0100
0.0010
01-Jan-91
31-Dec-92
01-Jan-95
31-Dec-96
01-Jan-99
01-Jan-01
01-Jan-03
01-Jan-05
01-Jan-07
01-Jan-09
02-Jan-11
01-Jan-13
02-Jan-15
Golden Ck u/s Lucky Ck (BC-36)
Lucky Ck u/s Golden Ck (BC-04)
Golden Ck d/s of Lucky Ck (BC-31)
Zinc

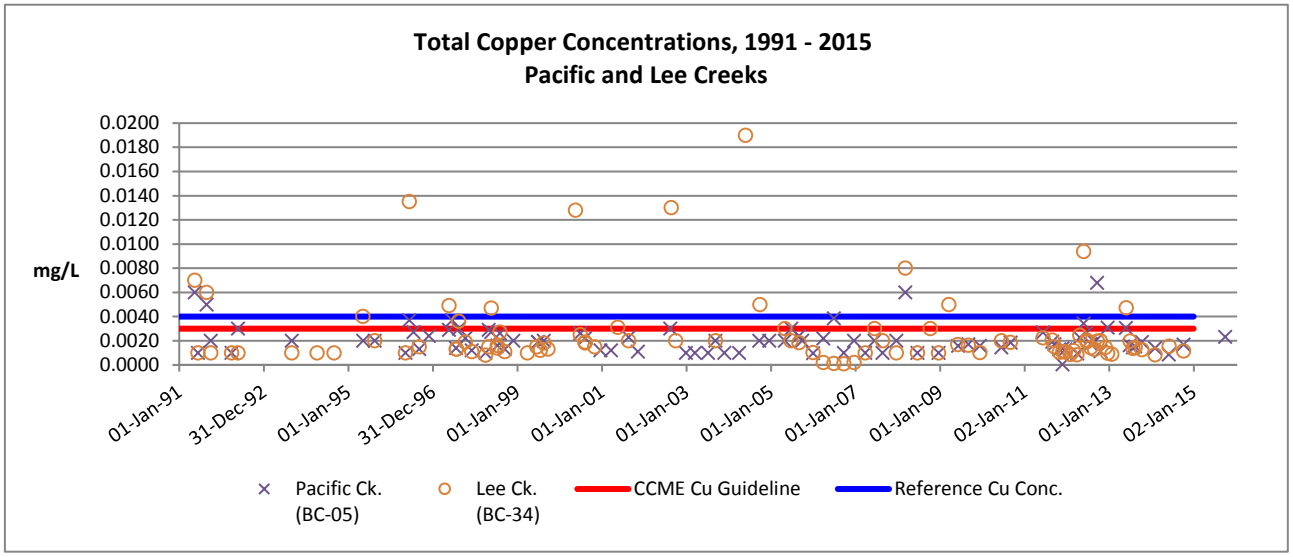

Total Copper Concentrations, 1991 - 2015
Lucky and Golden Creeks
log mg/L
1.0000
0.1000
0.0100
0.0010
0.0001
01-Jan-91
31-Dec-92
01-Jan-95
31-Dec-96
01-Jan-99
01-Jan-01
01-Jan-03
01-Jan-05
01-Jan-07
01-Jan-09
02-Jan-11
01-Jan-13
02-Jan-15
Golden Ck u/s Lucky Ck (BC-36)
Lucky Ck u/s Golden Ck (BC-04)
Golden Ck d/s of Lucky Ck (BC-31)
CCME Cu Guideline

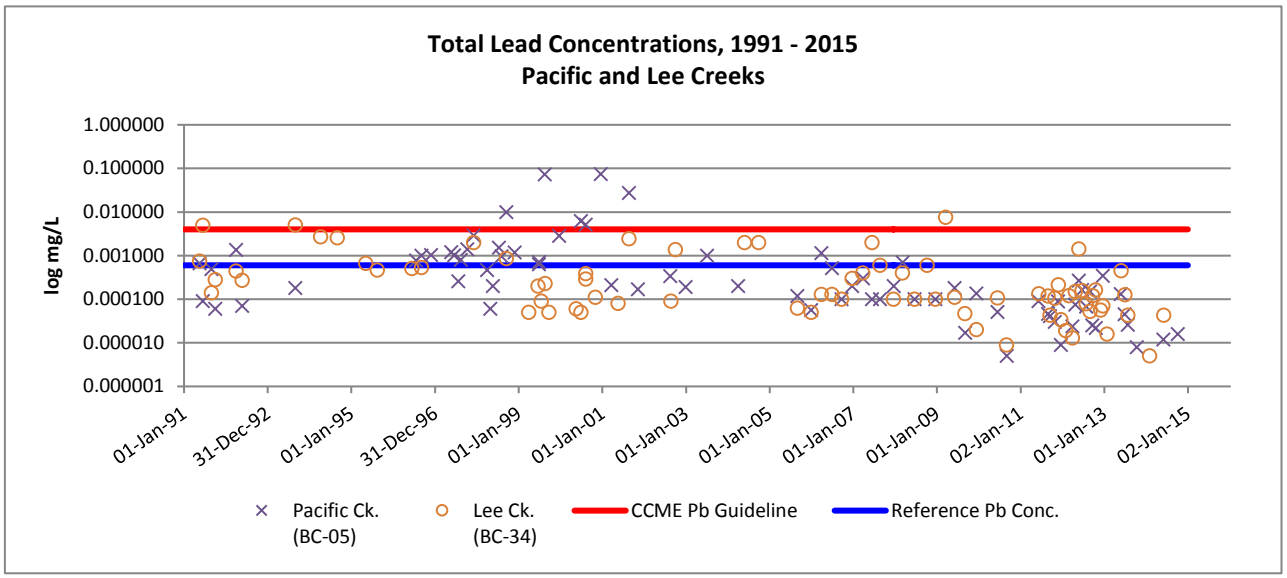

Total Lead Concentrations, 1991 - 2015
Lucky and Golden Creeks
log mg/L
1.000000
0.100000
0.010000
0.001000
0.000100
0.000010
0.000001
01-Jan-91
31-Dec-92
01-Jan-95
31-Dec-96
01-Jan-99
01-Jan-01
01-Jan-03
01-Jan-05
01-Jan-07
01-Jan-09
02-Jan-11
01-Jan-13
02-Jan-15
Golden Ck u/s Lucky Ck (BC-36)
Lucky Ck u/s Golden Ck (BC-04)
Golden Ck d/s of Lucky Ck (BC-31)
CCME Pb Guideline

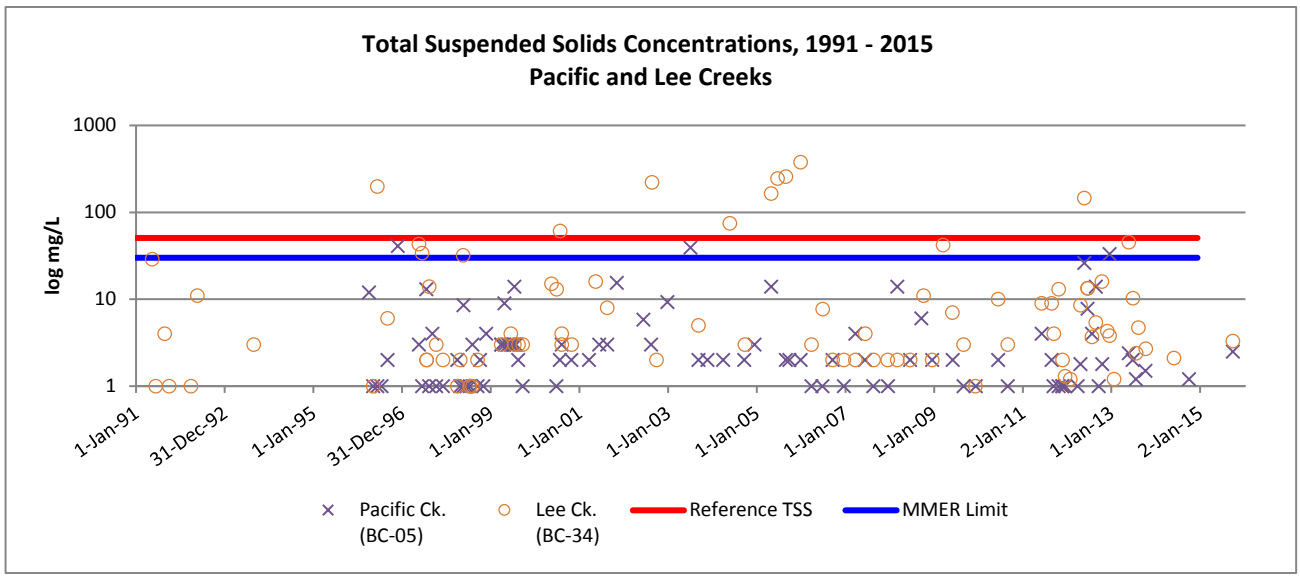

Total Suspended Solids Concentrations, 1991 - 2015
Lucky and Golden Creeks
log mg/L
10000
1000
100
10
1
01-Jan-91
31-Dec-92
01-Jan-95
31-Dec-96
01-Jan-99
01-Jan-01
01-Jan-03
01-Jan-05
01-Jan-07
01-Jan-09
02-Jan-11
01-Jan-13
02-Jan-15
Golden Ck u/s Lucky Ck (BC-36)
Lucky Ck u/s Golden Ck (BC-04)
Golden Ck d/s of Lucky Ck (BC-31)
MMER Limit

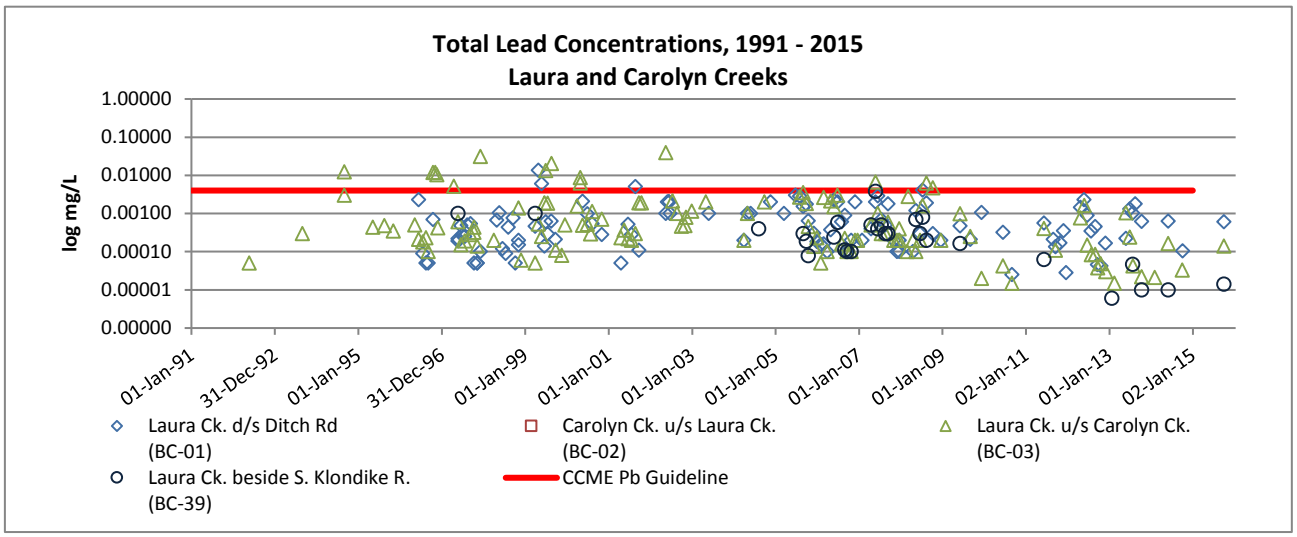

Total Nitrate Concentrations, 1991 - 2015
Lucky and Golden Creeks
log mg/L
10.000
1.000
0.100
0.010
01-Jan-91
31-Dec-92
01-Jan-95
31-Dec-96
01-Jan-99
01-Jan-01
01-Jan-03
01-Jan-05
01-Jan-07
01-Jan-09
02-Jan-11
01-Jan-13
02-Jan-15
Golden Ck u/s Lucky Ck (BC-36)
Lucky Ck u/s Golden Ck (BC-04)
Golden Ck d/s of Lucky Ck (BC-31)
CCME NO3 Guideline

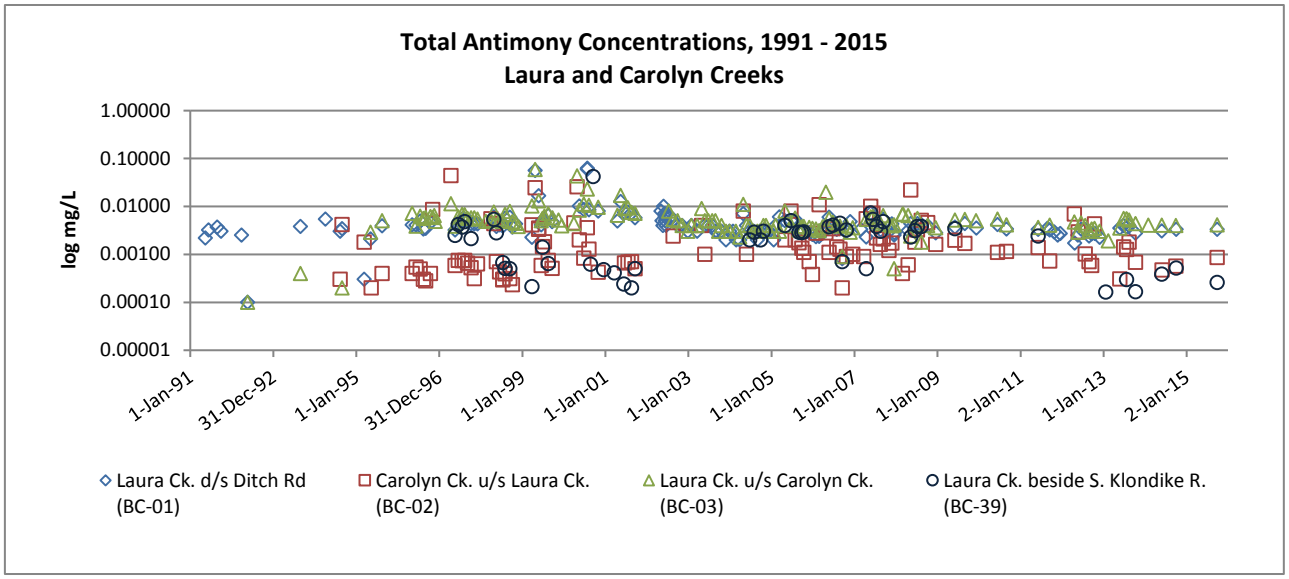

Total Zinc Concentrations, 1991 - 2015
Pacific and Lee Creeks
mg/L
0.10
0.09
0.08
0.07
0.06
0.05
0.04
0.03
0.02
0.01
0.00
01-Jan-91
31-Dec-92
01-Jan-95
31-Dec-96
01-Jan-99
01-Jan-01
01-Jan-03
01-Jan-05
01-Jan-07
01-Jan-09
02-Jan-11
01-Jan-13
02-Jan-15
Pacific Ck. (BC-05)
Lee Ck. (BC-34)
CCME Zn
Reference Zn Conc.

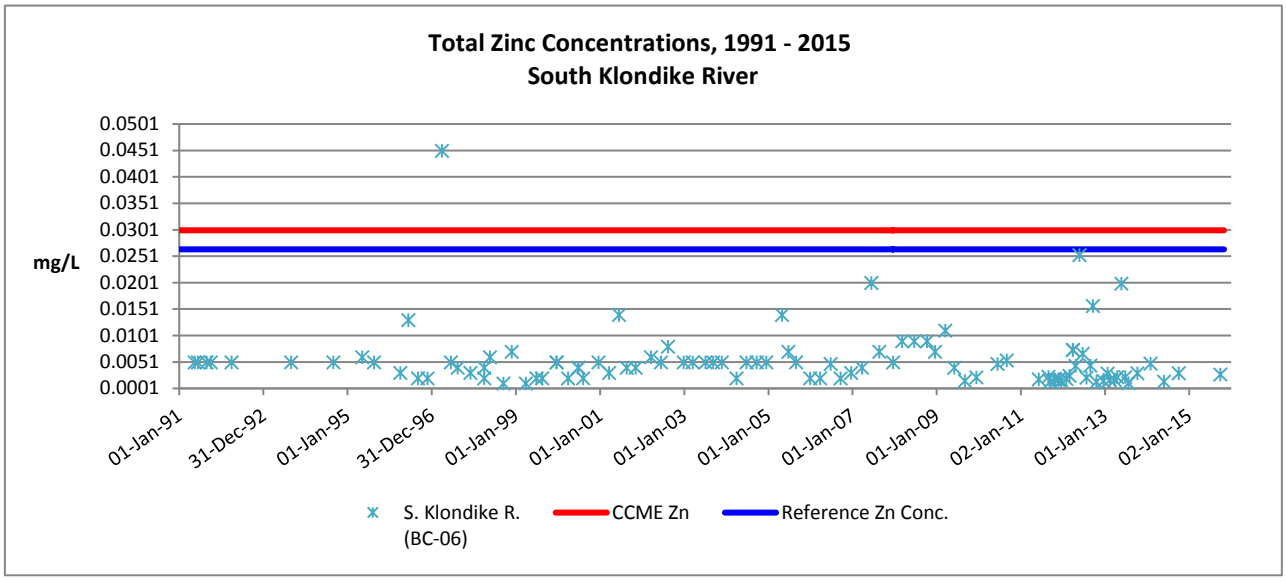

Total Copper Concentrations, 1991 - 2015
Pacific and Lee Creeks
mg/L
0.0200
0.0180
0.0160
0.0140
0.0120
0.0100
0.0080
0.0060
0.0040
0.0020
0.0000
01-Jan-91
31-Dec-92
01-Jan-95
31-Dec-96
01-Jan-99
01-Jan-01
01-Jan-03
01-Jan-05
01-Jan-07
01-Jan-09
02-Jan-11
01-Jan-13
02-Jan-15
Pacific Ck. (BC-05)
Lee Ck. (BC-34)
CCME Cu Guideline
Reference Cu Conc.

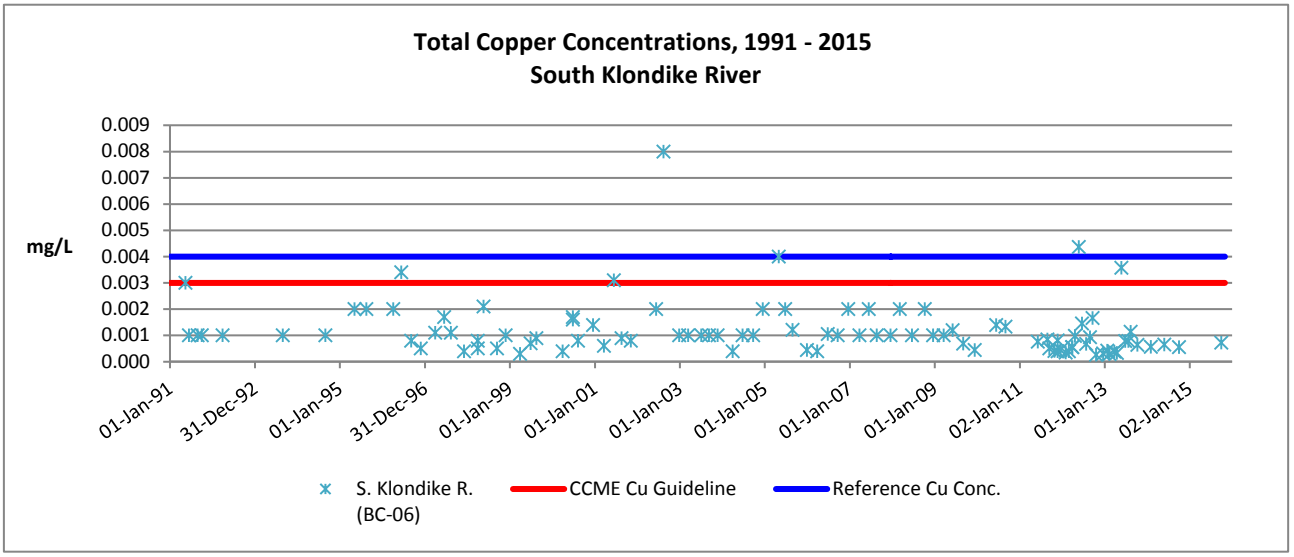

Total Lead Concentrations, 1991 - 2015
Pacific and Lee Creeks
log mg/L
1.000000
0.100000
0.010000
0.001000
0.000100
0.000010
0.000001
01-Jan-91
31-Dec-92
01-Jan-95
31-Dec-96
01-Jan-99
01-Jan-01
01-Jan-03
01-Jan-05
01-Jan-07
01-Jan-09
02-Jan-11
01-Jan-13
02-Jan-15
Pacific Ck. (BC-05)
Lee Ck. (BC-34)
CCME Pb Guideline
Reference Pb Conc.

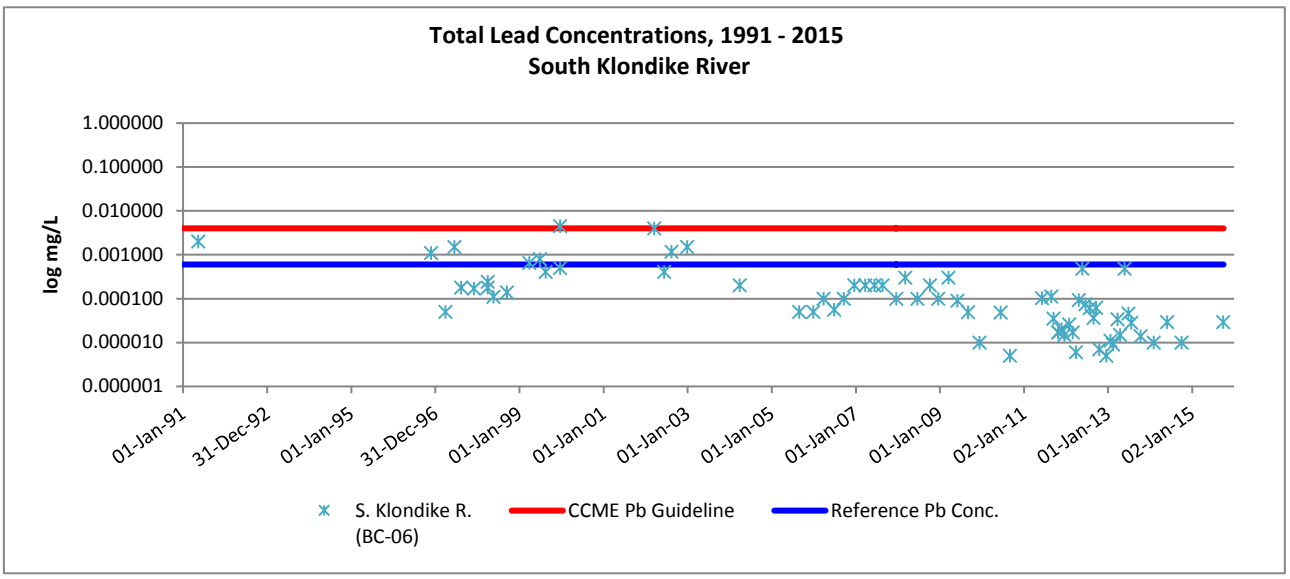

Total Suspended Solids Concentrations, 1991 - 2015
Pacific and Lee Creeks
log mg/L
1000
100
10
1
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
1-Jan-13
2-Jan-15
Pacific Ck. (BC-05)
Lee Ck. (BC-34)
Reference TSS
MMER Limit

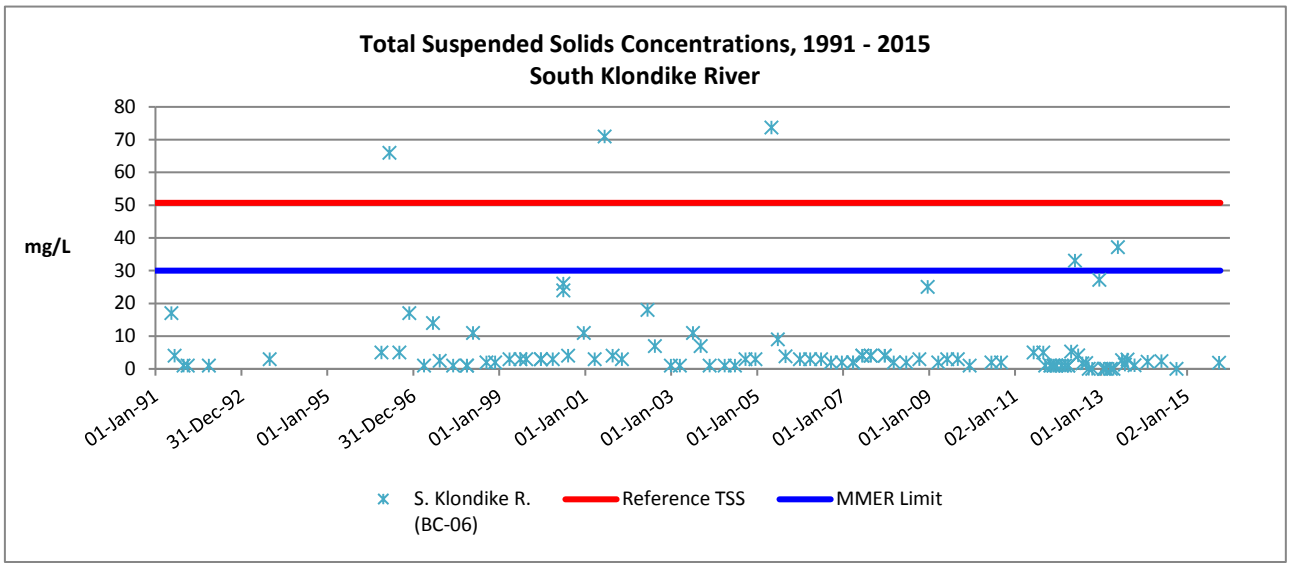

Total Lead Concentrations, 1991 - 2015
Laura and Carolyn Creeks
log mg/L
1.00000
0.10000
0.01000
0.00100
0.00010
0.00001
0.00000
01-Jan-91
31-Dec-92
01-Jan-95
31-Dec-96
01-Jan-99
01-Jan-01
01-Jan-03
01-Jan-05
01-Jan-07
01-Jan-09
02-Jan-11
01-Jan-13
02-Jan-15
Laura Ck. d/s Ditch Rd (BC-01)
Carolyn Ck. u/s Laura Ck. (BC-02)
Laura Ck. u/s Carolyn Ck. (BC-03)
Laura Ck. beside S. Klondike R. (BC-39)
CCME Pb Guideline

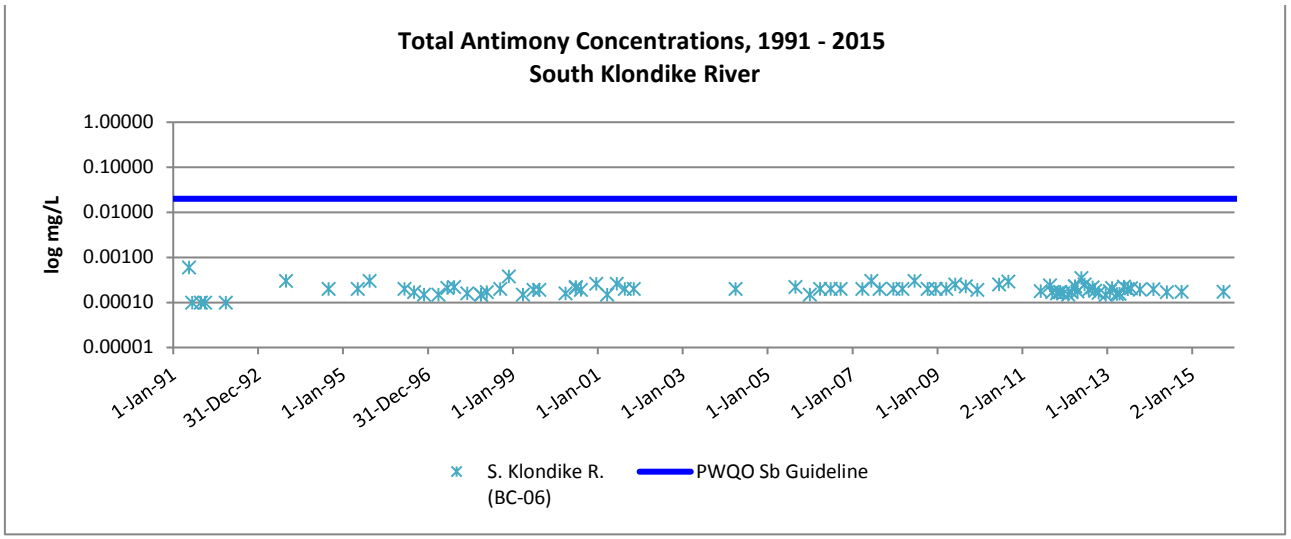

Total Antimony Concentrations, 1991 - 2015
Laura and Carolyn Creeks
log mg/L
1.00000
0.10000
0.01000
0.00100
0.00010
0.00001
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
1-Jan-13
2-Jan-15
Laura Ck. d/s Ditch Rd (BC-01)
Carolyn Ck. u/s Laura Ck. (BC-02)
Laura Ck. u/s Carolyn Ck. (BC-03)
Laura Ck. beside S. Klondike R. (BC-39)

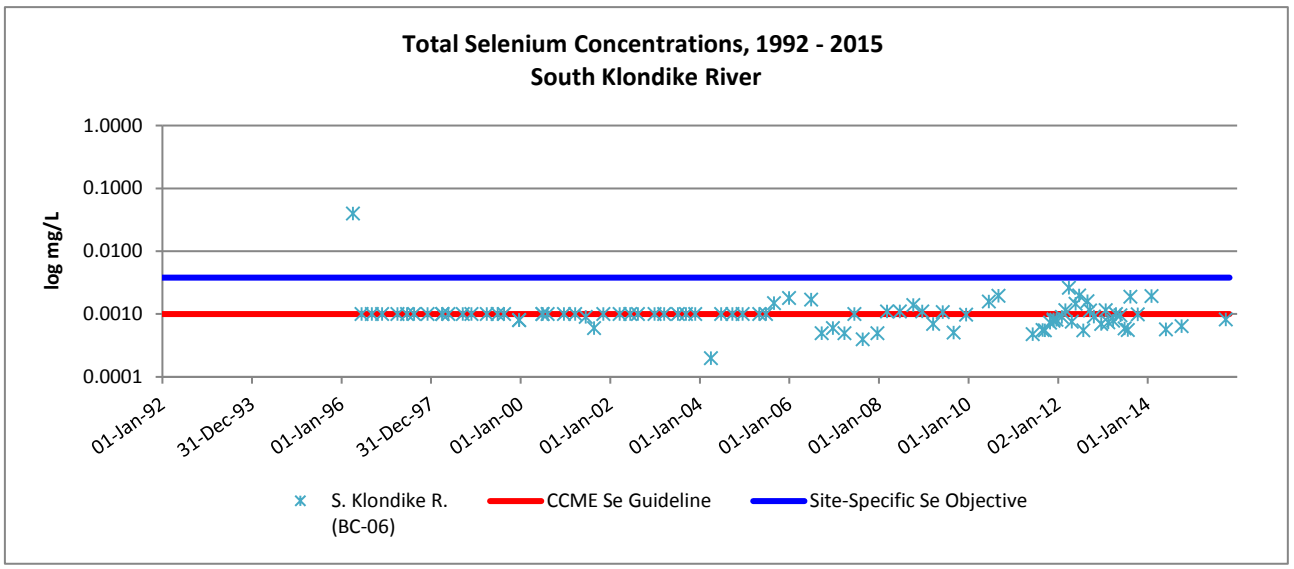

Total Zinc Concentrations, 1991 - 2015
South Klondike River
mg/L
0.0501
0.0451
0.0401
0.0351
0.0301
0.0251
0.0201
0.0151
0.0101
0.0051
0.0001
01-Jan-91
31-Dec-92
01-Jan-95
31-Dec-96
01-Jan-99
01-Jan-01
01-Jan-03
01-Jan-05
01-Jan-07
01-Jan-09
02-Jan-11
01-Jan-13
02-Jan-15
S. Klondike R. (BC-06)
CCME Zn
Reference Zn Conc.

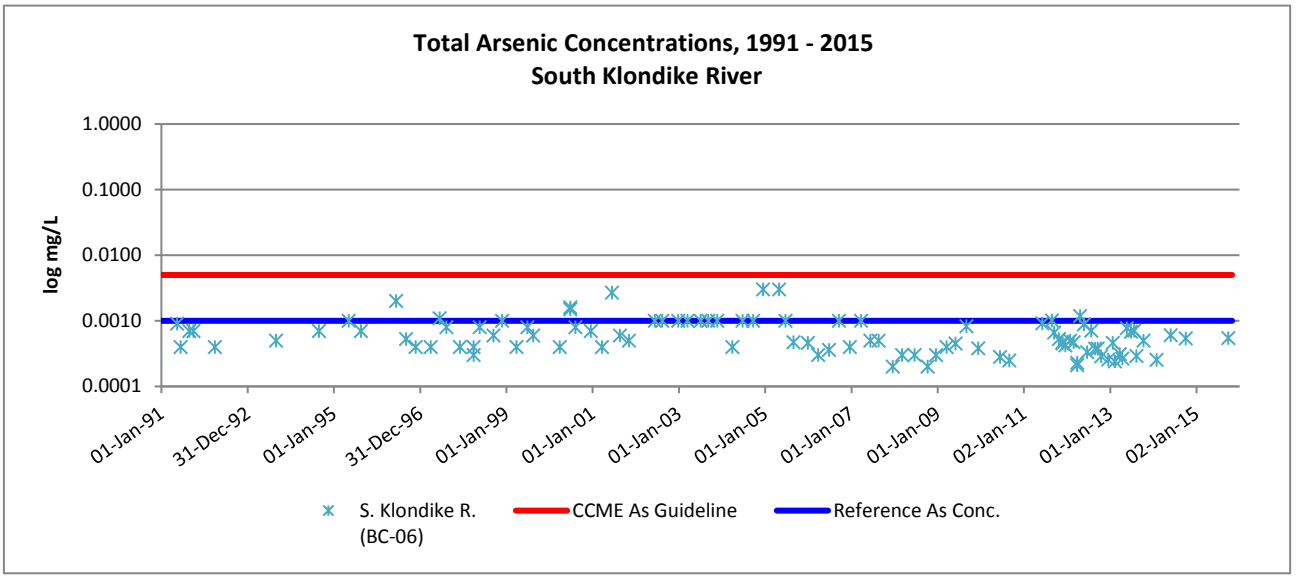

Total Copper Concentrations, 1991 - 2015
South Klondike River
mg/L
0.009
0.008
0.007
0.006
0.005
0.004
0.003
0.002
0.001
0.000
01-Jan-91
31-Dec-92
01-Jan-95
31-Dec-96
01-Jan-99
01-Jan-01
01-Jan-03
01-Jan-05
01-Jan-07
01-Jan-09
02-Jan-11
01-Jan-13
02-Jan-15
S. Klondike R. (BC-06)
CCME Cu Guideline
Reference Cu Conc.


Total Lead Concentrations, 1991 - 2015
South Klondike River
log mg/L
1.000000
0.100000
0.010000
0.001000
0.000100
0.000010
0.000001
01-Jan-91
31-Dec-92
01-Jan-95
31-Dec-96
01-Jan-99
01-Jan-01
01-Jan-03
01-Jan-05
01-Jan-07
01-Jan-09
02-Jan-11
01-Jan-13
02-Jan-15
S. Klondike R. (BC-06)
CCME Pb Guideline
Reference Pb Conc.


Total Suspended Solids Concentrations, 1991 - 2015
South Klondike River
mg/L
80
70
60
50
40
30
20
10
0
01-Jan-91
31-Dec-92
01-Jan-95
31-Dec-96
01-Jan-99
01-Jan-01
01-Jan-03
01-Jan-05
01-Jan-07
01-Jan-09
02-Jan-11
01-Jan-13
02-Jan-15
S. Klondike R. (BC-06)
Reference TSS
MMER Limit

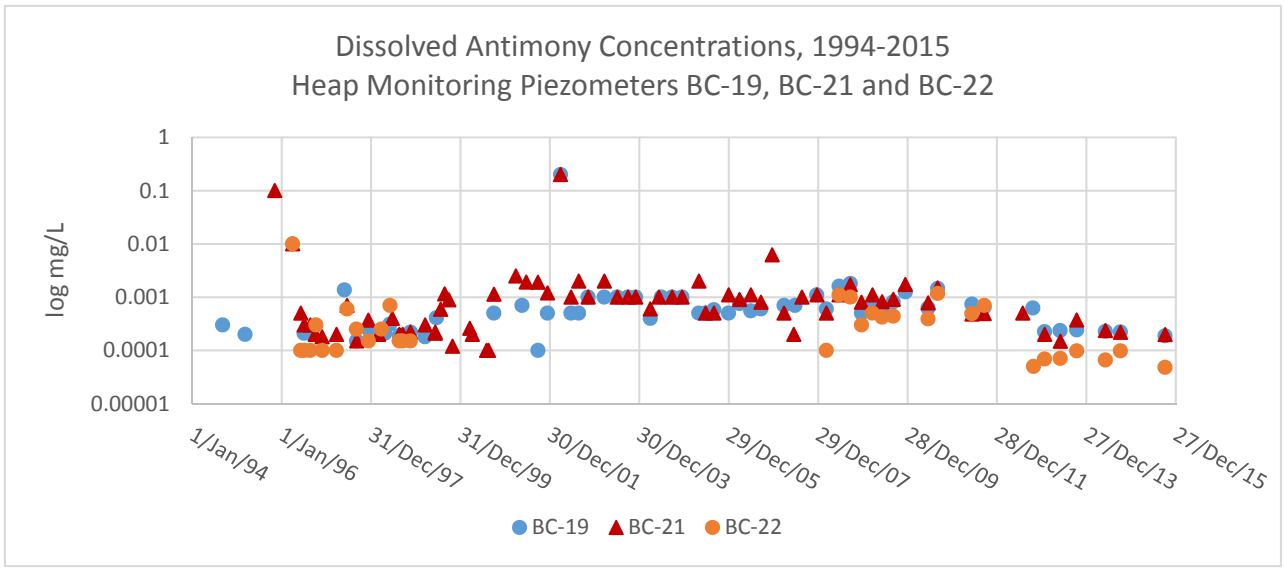

Total Antimony Concentrations, 1991 - 2015
South Klondike River
log mg/L
1.00000
0.10000
0.01000
0.00100
0.00010
0.00001
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
1-Jan-13
2-Jan-15
S. Klondike R. (BC-06)
PWQO Sb Guideline

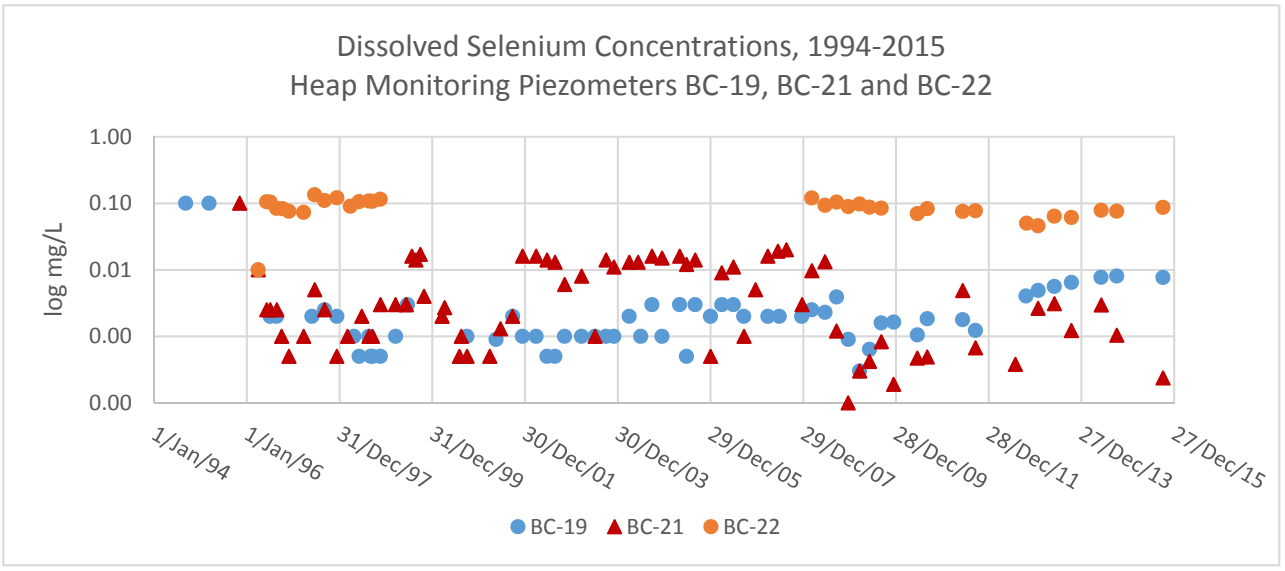

Total Selenium Concentrations, 1992 - 2015
South Klondike River
log mg/L
1.0000
0.1000
0.0100
0.0010
0.0001
01-Jan-92
31-Dec-93
01-Jan-96
31-Dec-97
01-Jan-00
01-Jan-02
01-Jan-04
01-Jan-06
01-Jan-08
01-Jan-10
02-Jan-12
01-Jan-14
S. Klondike R. (BC-06)
CCME Se Guideline
Site-Specific Se Objective

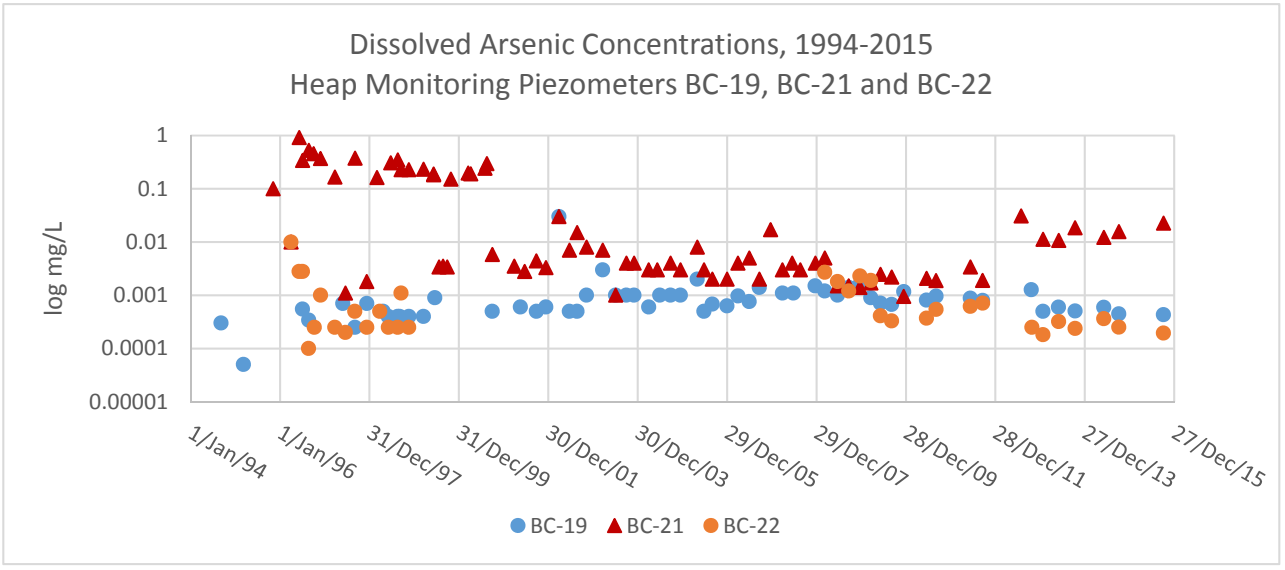

Total Arsenic Concentrations, 1991 - 2015
South Klondike River
log mg/L
1.0000
0.1000
0.0100
0.0010
0.0001
01-Jan-91
31-Dec-92
01-Jan-95
31-Dec-96
01-Jan-99
01-Jan-01
01-Jan-03
01-Jan-05
01-Jan-07
01-Jan-09
02-Jan-11
01-Jan-13
02-Jan-15
S. Klondike R. (BC-06)
CCME As Guideline
Reference As Conc.

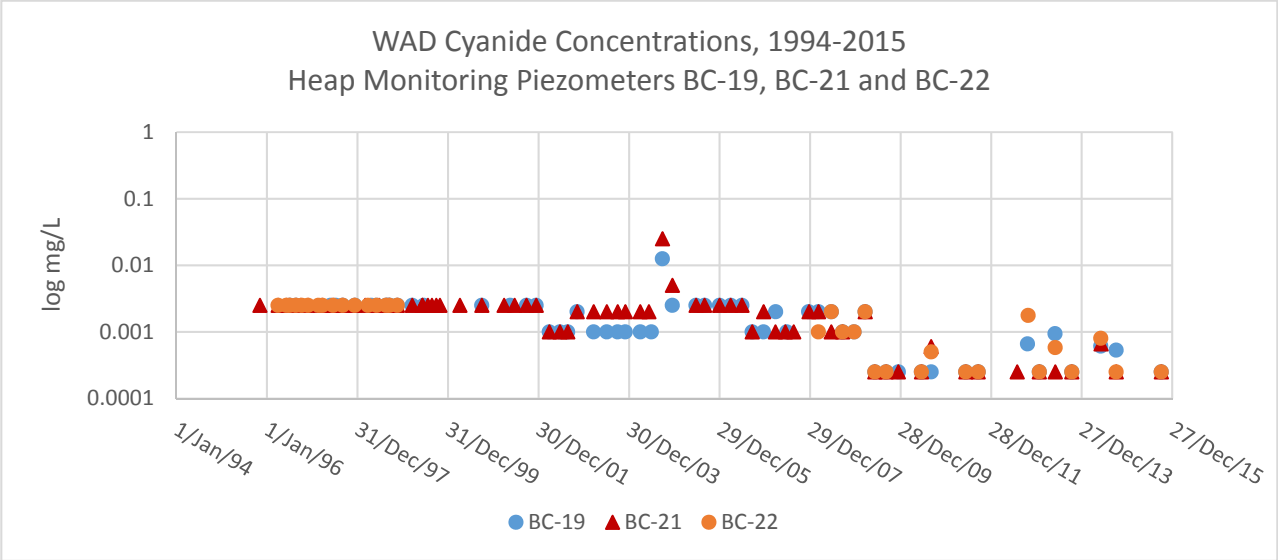
APPENDIX C

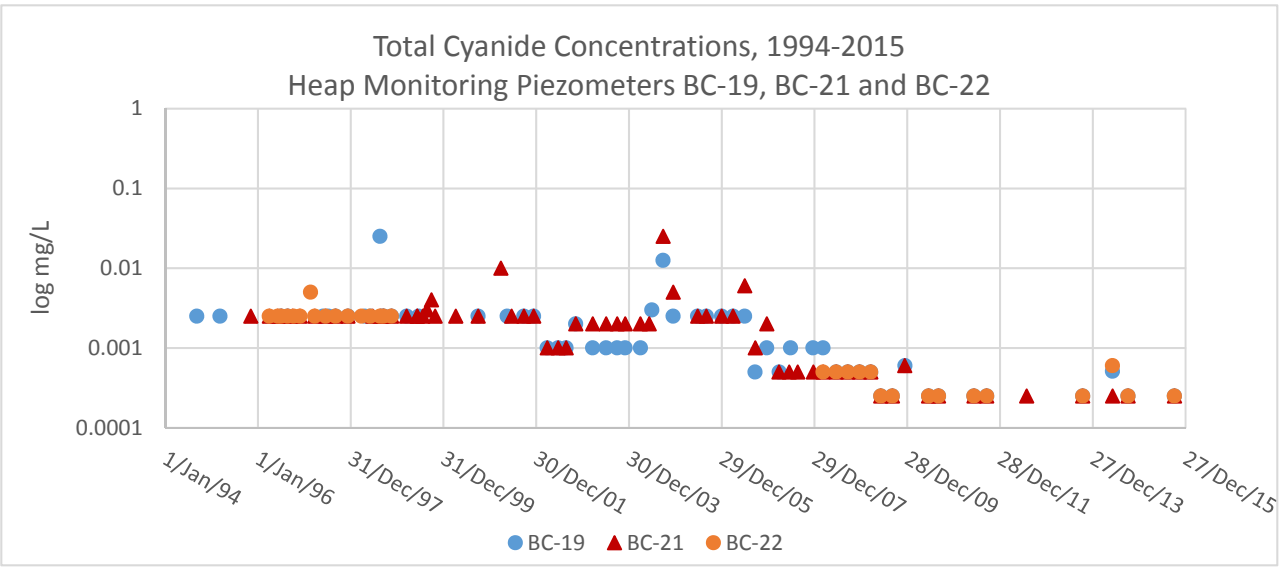
GROUNDWATER GRAPHICAL DATA

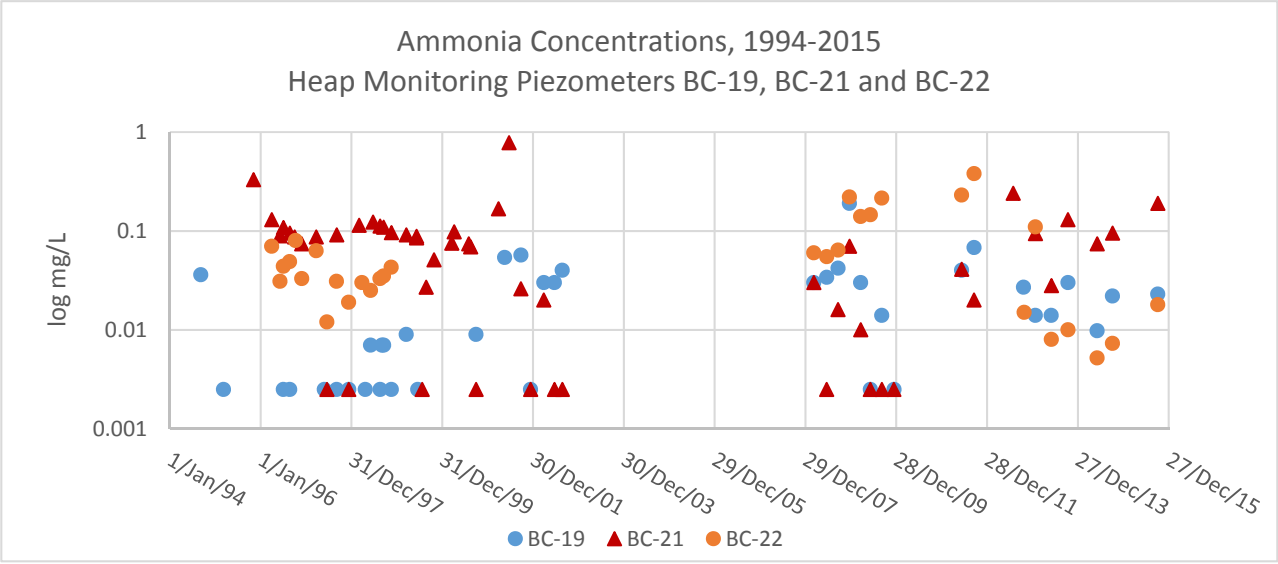

Dissolved Antimony Concentrations, 1994-2015
Heap Monitoring Piezometers BC-19, BC-21 and BC-22
log mg/L
1
0.1
0.01
0.001
0.0001
0.00001
1/Jan/94
1/Jan/96
31/Dec/97
31/Dec/99
30/Dec/01
30/Dec/03
29/Dec/05
29/Dec/07
28/Dec/09
28/Dec/11
27/Dec/13
27/Dec/15
BC-19
BC-21
BC-22

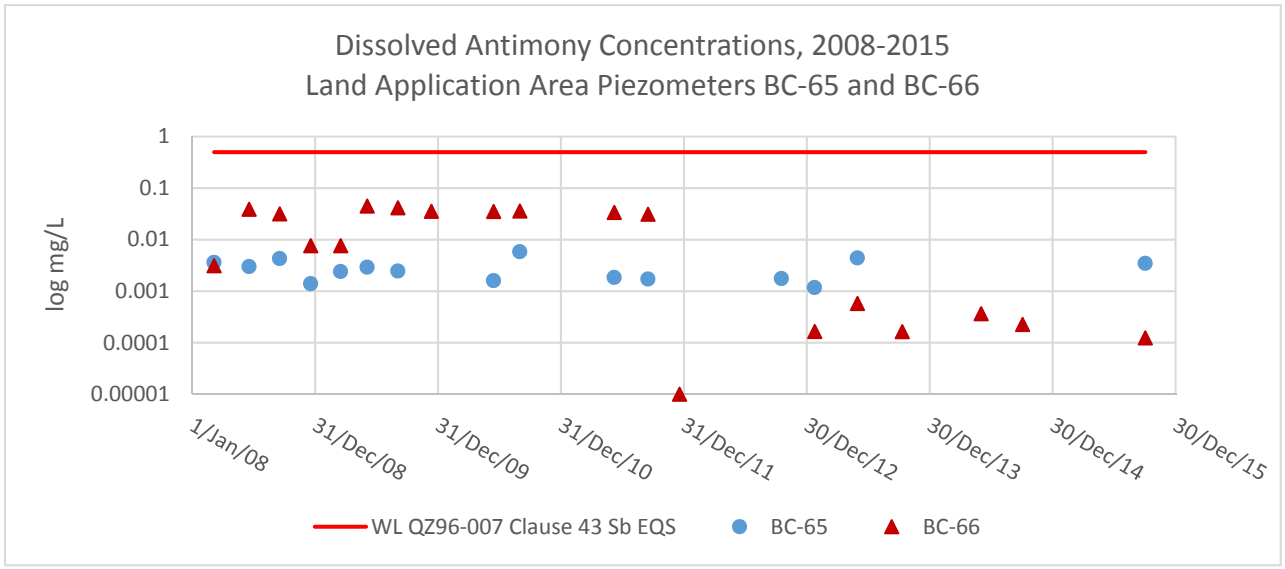

Dissolved Selenium Concentrations, 1994-2015
Heap Monitoring Piezometers BC-19, BC-21 and BC-22
log mg/L
1.00
0.10
0.01
0.00
0.00
1/Jan/94
1/Jan/96
31/Dec/97
31/Dec/99
30/Dec/01
30/Dec/03
29/Dec/05
29/Dec/07
28/Dec/09
28/Dec/11
27/Dec/13
27/Dec/15
BC-19
BC-21
BC-22

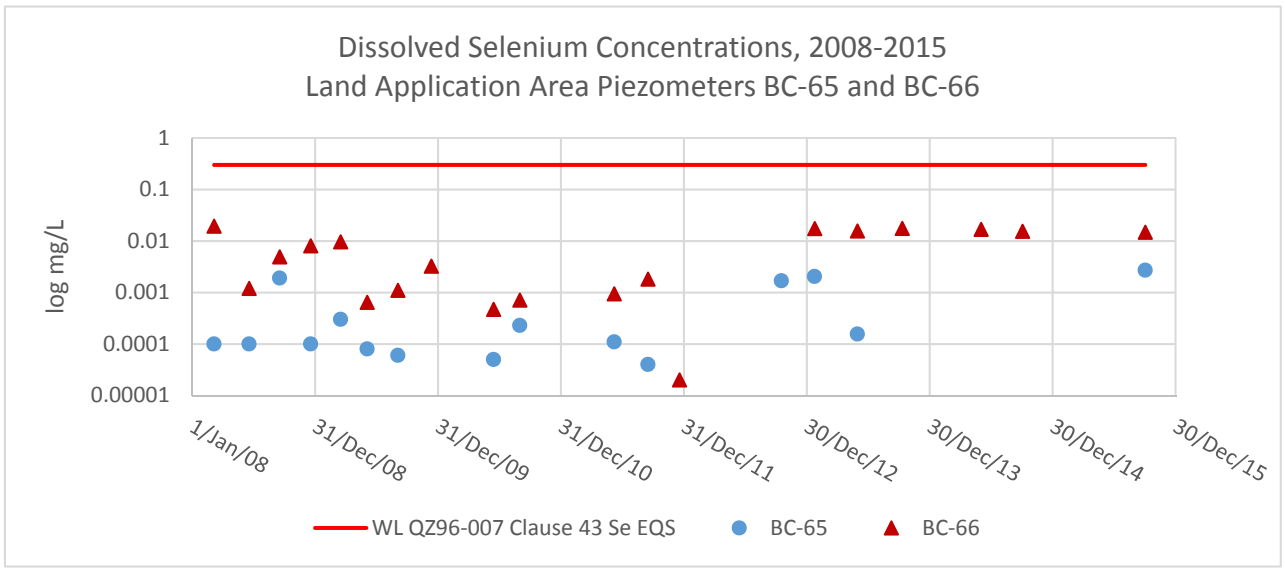

Dissolved Arsenic Concentrations, 1994-2015
Heap Monitoring Piezometers BC-19, BC-21 and BC-22
log mg/L
1
0.1
0.01
0.001
0.0001
0.00001
1/Jan/94
1/Jan/96
31/Dec/97
31/Dec/99
30/Dec/01
30/Dec/03
29/Dec/05
29/Dec/07
28/Dec/09
28/Dec/11
27/Dec/13
27/Dec/15
BC-19
BC-21
BC-22

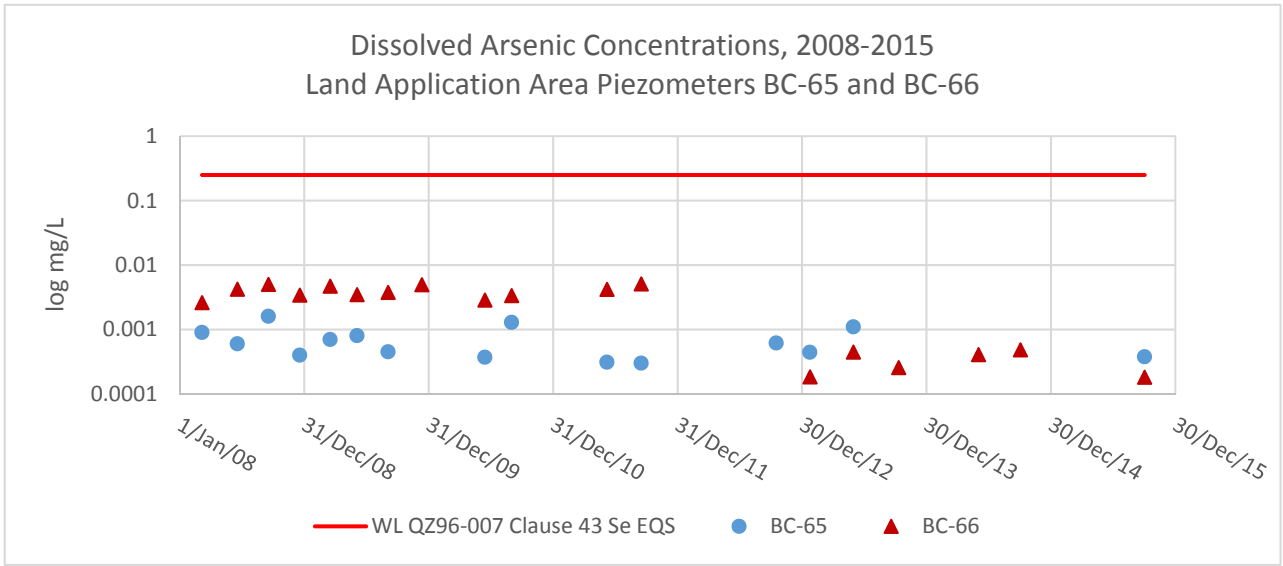

WAD Cyanide Concentrations, 1994-2015
Heap Monitoring Piezometers BC-19, BC-21 and BC-22
log mg/L
1
0.1
0.01
0.001
0.0001
1/Jan/94
1/Jan/96
31/Dec/97
31/Dec/99
30/Dec/01
30/Dec/03
29/Dec/05
29/Dec/07
28/Dec/09
28/Dec/11
27/Dec/13
27/Dec/15
BC-19
BC-21
BC-22

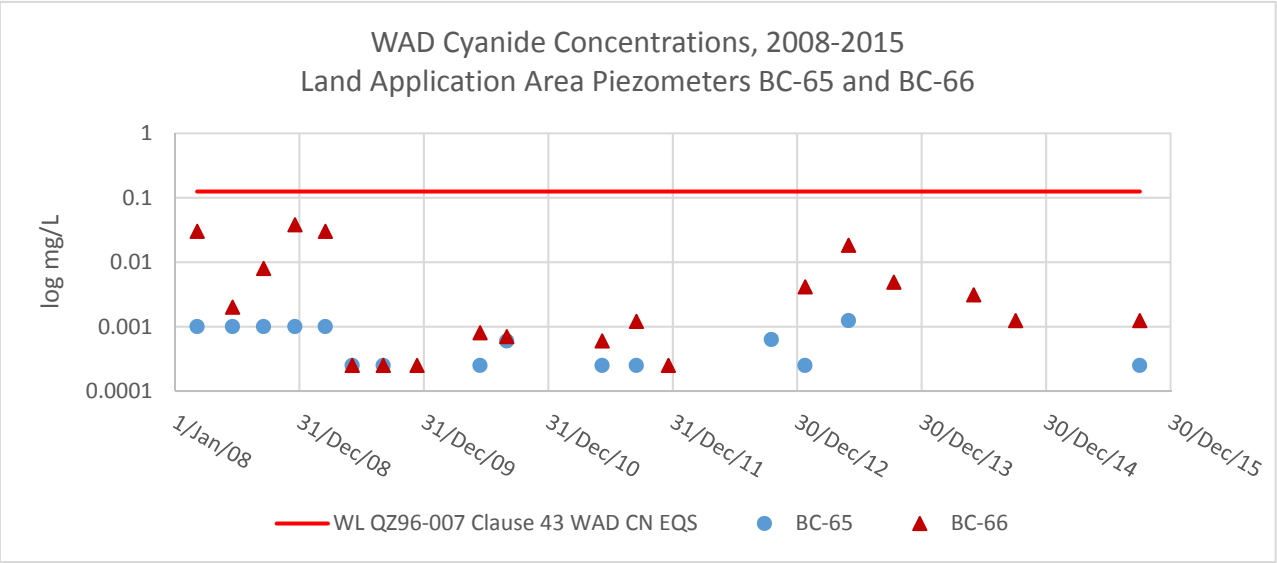

Total Cyanide Concentrations, 1994-2015
Heap Monitoring Piezometers BC-19, BC-21 and BC-22
log mg/L
1
0.1
0.01
0.001
0.0001
1/Jan/94
1/Jan/96
31/Dec/97
31/Dec/99
30/Dec/01
30/Dec/03
29/Dec/05
29/Dec/07
28/Dec/09
28/Dec/11
27/Dec/13
27/Dec/15
BC-19
BC-21
BC-22

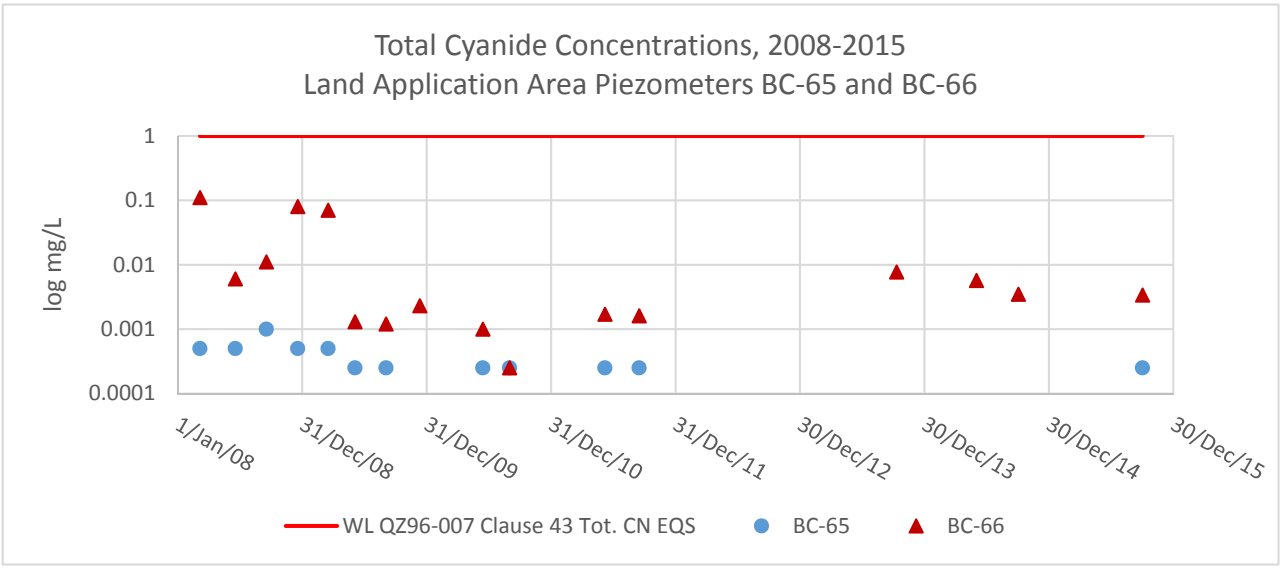

Ammonia Concentrations, 1994-2015
Heap Monitoring Piezometers BC-19, BC-21 and BC-22
log mg/L
1
0.1
0.01
0.001
1/Jan/94
1/Jan/96
31/Dec/97
31/Dec/99
30/Dec/01
30/Dec/03
29/Dec/05
29/Dec/07
28/Dec/09
28/Dec/11
27/Dec/13
27/Dec/15
BC-19
BC-21
BC-22

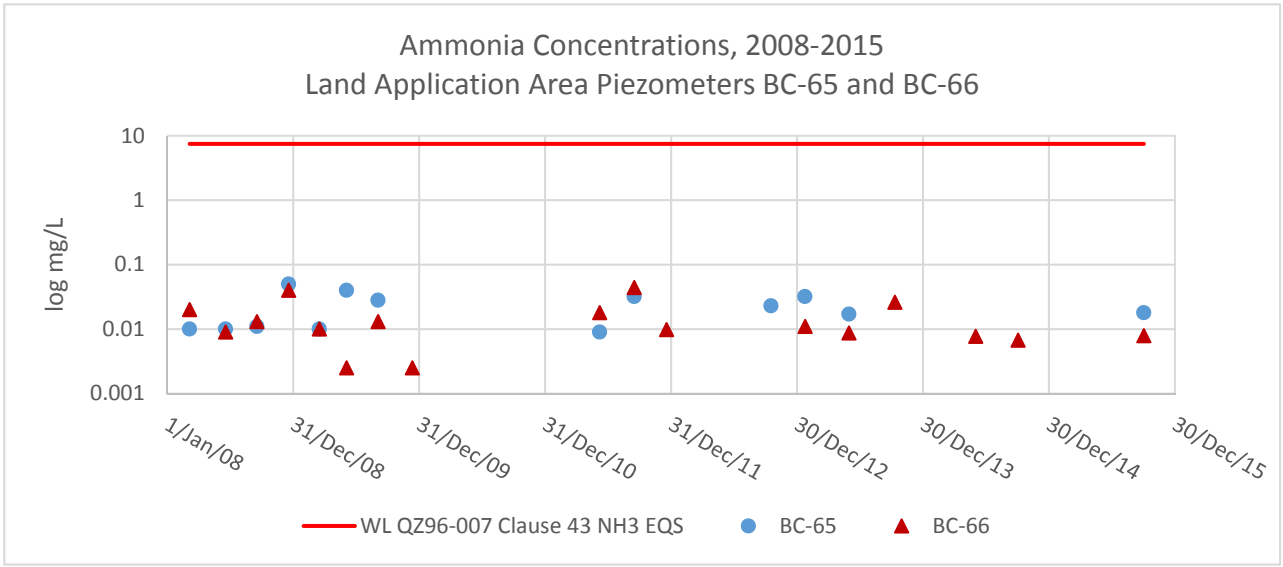

Dissolved Antimony Concentrations, 2008-2015
Land Application Area Piezometers BC-65 and BC-66
log mg/L
1
0.1
0.01
0.001
0.0001
0.00001
1/Jan/08
31/Dec/08
31/Dec/09
31/Dec/10
31/Dec/11
30/Dec/12
30/Dec/13
30/Dec/14
30/Dec/15
WL QZ96-007 Clause 43 Sb EQS
BC-65
BC-66

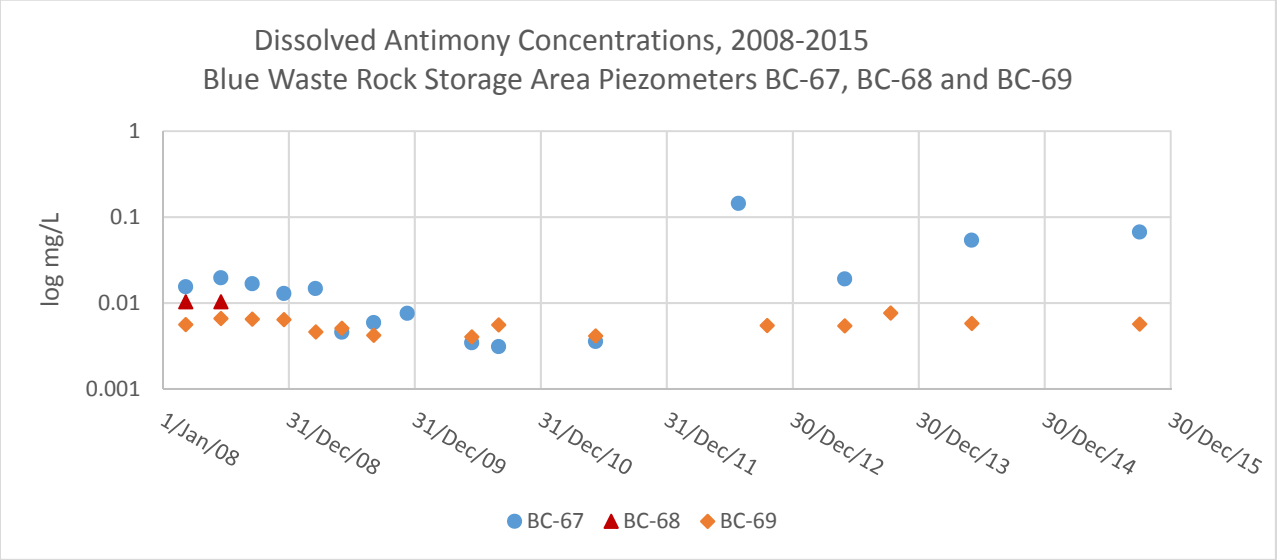

Dissolved Selenium Concentrations, 2008-2015
Land Application Area Piezometers BC-65 and BC-66
log mg/L
1
0.1
0.01
0.001
0.0001
0.00001
1/Jan/08
31/Dec/08
31/Dec/09
31/Dec/10
31/Dec/11
30/Dec/12
30/Dec/13
30/Dec/14
30/Dec/15
WL QZ96-007 Clause 43 Se EQS
BC-65
BC-66

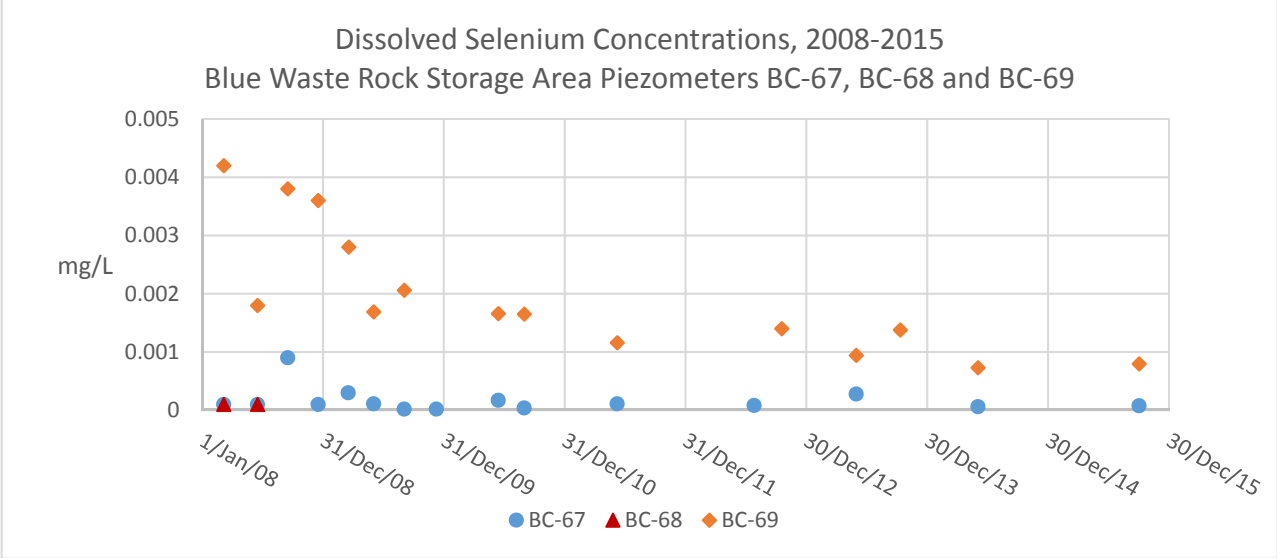

Dissolved Arsenic Concentrations, 2008-2015
Land Application Area Piezometers BC-65 and BC-66
log mg/L
1
0.1
0.01
0.001
0.0001
1/Jan/08
31/Dec/08
31/Dec/09
31/Dec/10
31/Dec/11
30/Dec/12
30/Dec/13
30/Dec/14
30/Dec/15
WL QZ96-007 Clause 43 Se EQS
BC-65
BC-66

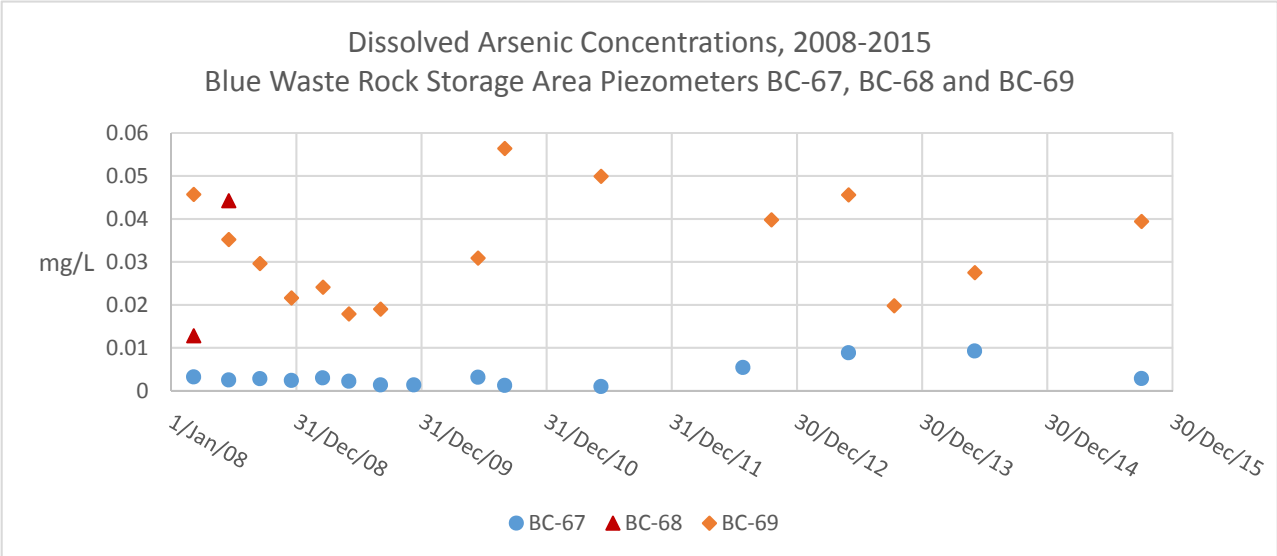

WAD Cyanide Concentrations, 2008-2015
Land Application Area Piezometers BC-65 and BC-66
log mg/L
1
0.1
0.01
0.001
0.0001
1/Jan/08
31/Dec/08
31/Dec/09
31/Dec/10
31/Dec/11
30/Dec/12
30/Dec/13
30/Dec/14
30/Dec/15
WL QZ96-007 Clause 43 WAD CN EQS
BC-65
BC-66

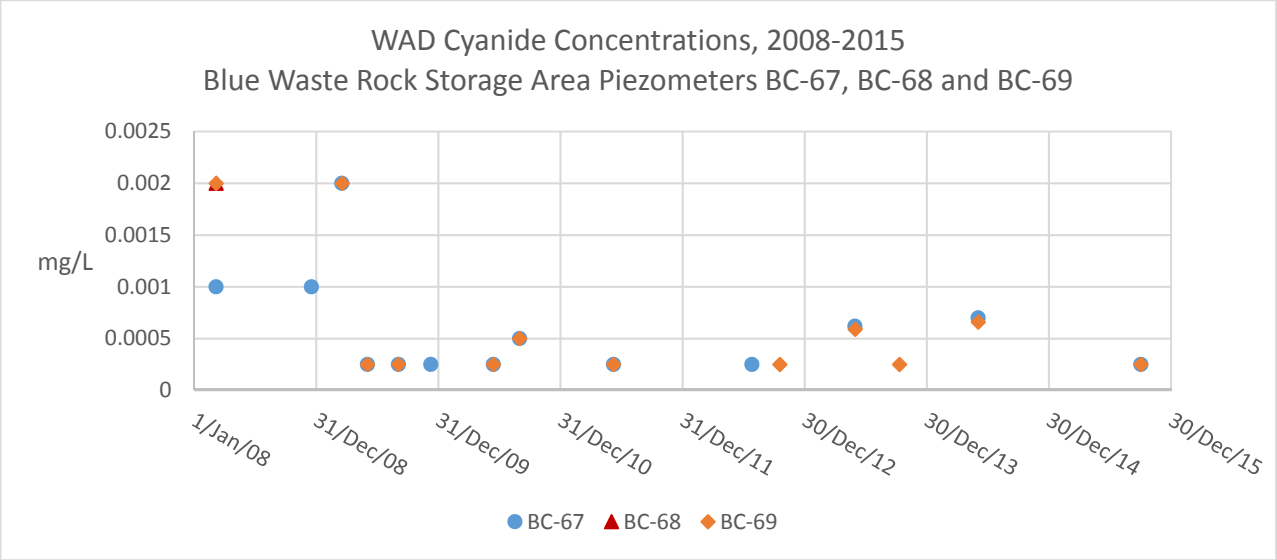

Total Cyanide Concentrations, 2008-2015
Land Application Area Piezometers BC-65 and BC-66
log mg/L
1
0.1
0.01
0.001
0.0001
1/Jan/08
31/Dec/08
31/Dec/09
31/Dec/10
31/Dec/11
30/Dec/12
30/Dec/13
30/Dec/14
30/Dec/15
WL QZ96-007 Clause 43 Tot. CN EQS
BC-65
BC-66

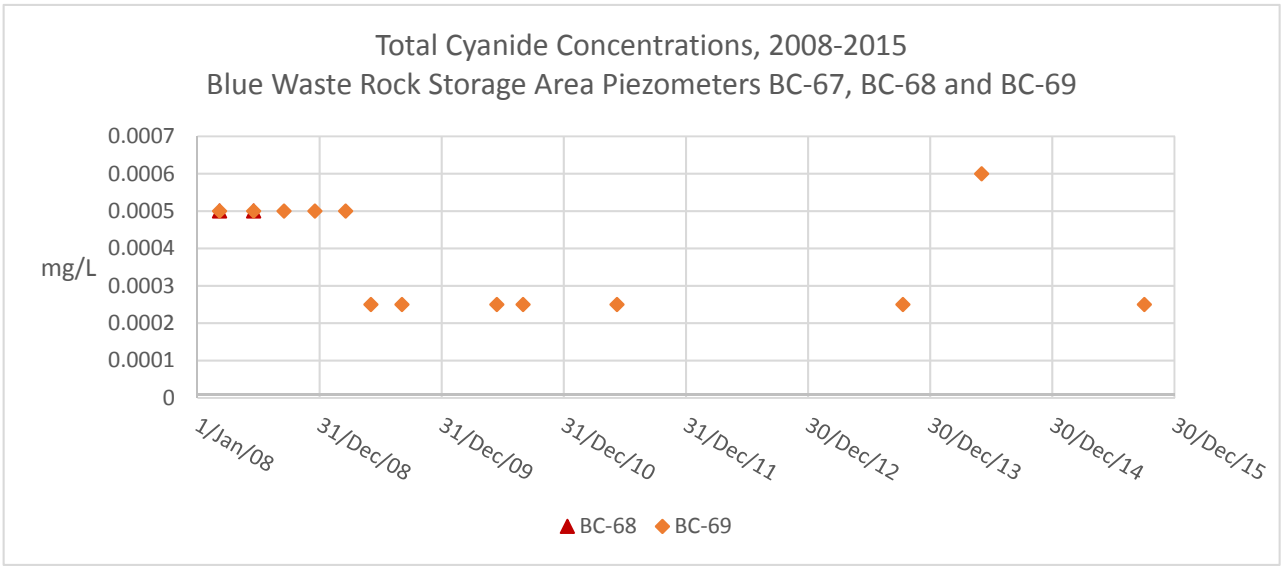

Ammonia Concentrations, 2008-2015
Land Application Area Piezometers BC-65 and BC-66
log mg/L
10
1
0.1
0.01
0.001
1/Jan/08
31/Dec/08
31/Dec/09
31/Dec/10
31/Dec/11
30/Dec/12
30/Dec/13
30/Dec/14
30/Dec/15
WL QZ96-007 Clause 43 NH3 EQS
BC-65
BC-66

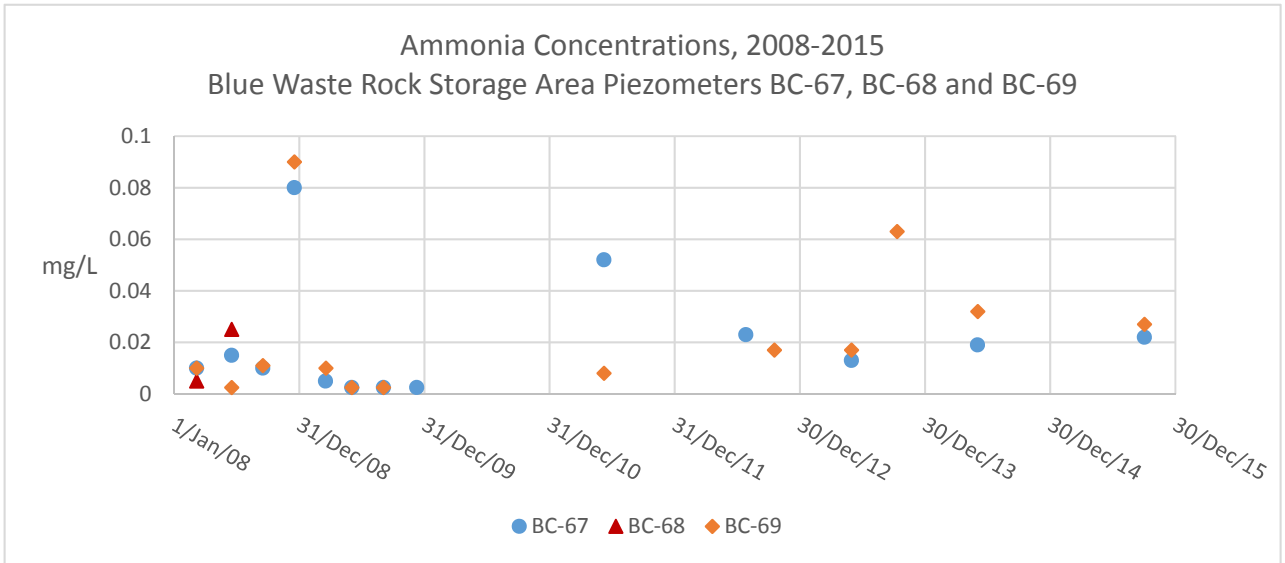

Dissolved Antimony Concentrations, 2008-2015
Blue Waste Rock Storage Area Piezometers BC-67, BC-68 and BC-69
log mg/L
1
0.1
0.01
0.001
1/Jan/08
31/Dec/08
31/Dec/09
31/Dec/10
31/Dec/11
30/Dec/12
30/Dec/13
30/Dec/14
30/Dec/15
BC-67
BC-68
BC-69


Dissolved Selenium Concentrations, 2008-2015
Blue Waste Rock Storage Area Piezometers BC-67, BC-68 and BC-69
mg/L
0.005
0.004
0.003
0.002
0.001
0
1/Jan/08
31/Dec/08
31/Dec/09
31/Dec/10
31/Dec/11
30/Dec/12
30/Dec/13
30/Dec/14
30/Dec/15
BC-67
BC-68
BC-69


Dissolved Arsenic Concentrations, 2008-2015
Blue Waste Rock Storage Area Piezometers BC-67, BC-68 and BC-69
mg/L
0.06
0.05
0.04
0.03
0.02
0.01
0
1/Jan/08
31/Dec/08
31/Dec/09
31/Dec/10
31/Dec/11
30/Dec/12
30/Dec/13
30/Dec/14
30/Dec/15
BC-67
BC-68
BC-69


WAD Cyanide Concentrations, 2008-2015
Blue Waste Rock Storage Area Piezometers BC-67, BC-68 and BC-69
mg/L
0.0025
0.002
0.0015
0.001
0.0005
0
1/Jan/08
31/Dec/08
31/Dec/09
31/Dec/10
31/Dec/11
30/Dec/12
30/Dec/13
30/Dec/14
30/Dec/15
BC-67
BC-68
BC-69


Total Cyanide Concentrations, 2008-2015
Blue Waste Rock Storage Area Piezometers BC-67, BC-68 and BC-69
mg/L
0.0007
0.0006
0.0005
0.0004
0.0003
0.0002
0.0001
0
1/Jan/08
31/Dec/08
31/Dec/09
31/Dec/10
31/Dec/11
30/Dec/12
30/Dec/13
30/Dec/14
30/Dec/15
BC-68
BC-69


Ammonia Concentrations, 2008-2015
Blue Waste Rock Storage Area Piezometers BC-67, BC-68 and BC-69
mg/L
0.1
0.08
0.06
0.04
0.02
0
1/Jan/08
31/Dec/08
31/Dec/09
31/Dec/10
31/Dec/11
30/Dec/12
30/Dec/13
30/Dec/14
30/Dec/15
BC-67
BC-68
BC-69

APPENDIX C

LAB REPORTS

Your Project #: GPBC-13-01

Attention:Scott Keesey

Alexco Environmental Group Inc.
Unit 3 Calcite Business Centre
151 Industrial Road
WHITEHORSE, YT
CANADA Y1A 2V3

Your C.O.C. #: 08412388, 08412389, 08412390, 08412391, 08412392

Report Date: 2015/10/13
Report #: R2056770
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B587453
Received: 2015/10/05, 11:00

Sample Matrix: Water
Samples Received: 30

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity - Water	27	2015/10/07	2015/10/07	BBY6SOP-00026	SM 22 2320 B m
Chloride by Automated Colourimetry	21	N/A	2015/10/06	BBY6SOP-00011	SM 22 4500-Cl- G m
Chloride by Automated Colourimetry	2	N/A	2015/10/09	BBY6SOP-00011	SM 22 4500-Cl- G m
Cyanide SAD (strong acid dissociable)	18	N/A	2015/10/06	BBY6SOP-00004	SM 22 4500-CN O m
Cyanide SAD (strong acid dissociable)	5	N/A	2015/10/07	BBY6SOP-00004	SM 22 4500-CN O m
Cyanide WAD (weak acid dissociable)	18	N/A	2015/10/06	BBY6SOP-00004	SM 22 4500-CN O
Cyanide WAD (weak acid dissociable)	5	N/A	2015/10/07	BBY6SOP-00004	SM 22 4500-CN O
Conductance - water	27	N/A	2015/10/07	BBY6SOP-00026	SM 22 2510 B m
Hardness Total (calculated as CaCO3)	21	N/A	2015/10/07	BBY7SOP-00002	EPA 6020a R1 m
Hardness (calculated as CaCO3)	28	N/A	2015/10/07	BBY7SOP-00002	EPA 6020a R1 m
Hardness (calculated as CaCO3)	2	N/A	2015/10/09	BBY7SOP-00002	EPA 6020a R1 m
Mercury (Dissolved-LowLevel) by CVAF	30	N/A	2015/10/07	BBY7SOP-00015	BCMOE BCLM Oct2013 m
Mercury (Total-LowLevel) by CVAF	21	2015/10/07	2015/10/07	BBY7SOP-00015	BCMOE BCLM Oct2013 m
Ion Balance	23	N/A	2015/10/07	BBY WI-00033	SM 22 1030E
Sum of cations, anions	23	N/A	2015/10/07	Calc	
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	29	N/A	2015/10/07	BBY7SOP-00002	EPA 6020A R1 m
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	1	N/A	2015/10/09	BBY7SOP-00002	EPA 6020A R1 m
Elements by ICPMS Low Level (dissolved)	13	N/A	2015/10/06	BBY7SOP-00002	EPA 6020A R1 m
Elements by ICPMS Low Level (dissolved)	17	N/A	2015/10/07	BBY7SOP-00002	EPA 6020A R1 m
Elements by ICPMS Digested LL (total)	9	2015/10/06	2015/10/07	BBY7SOP-00002	EPA 6020A R1 m
Na, K, Ca, Mg, S by CRC ICPMS (total)	21	N/A	2015/10/07	BBY7SOP-00002	EPA 6020A R1 m
Elements by ICPMS Low Level (total)	12	N/A	2015/10/06	BBY7SOP-00002	EPA 6020A R1 m
Ammonia-N (Unpreserved)	1	N/A	2015/10/07	BBY6SOP-00009	SM 22 4500-NH3- G m
Ammonia-N (Preserved)	29	N/A	2015/10/07	BBY6SOP-00009	SM 22 4500-NH3- G m
Nitrate+Nitrite (N) (low level)	26	N/A	2015/10/06	BBY6SOP-00010	SM 22 4500-NO3- I m
Nitrate+Nitrite (N) (low level)	1	N/A	2015/10/08	BBY6SOP-00010	SM 22 4500-NO3- I m
Nitrite (N) (low level)	27	N/A	2015/10/06	BBY6SOP-00010	SM 22 4500-NO3- I m

Your Project #: GPBC-13-01

Attention:Scott Keesey

Alexco Environmental Group Inc.
Unit 3 Calcite Business Centre
151 Industrial Road
WHITEHORSE, YT
CANADA Y1A 2V3

Your C.O.C. #: 08412388, 08412389, 08412390, 08412391, 08412392

Report Date: 2015/10/13
Report #: R2056770
Version: 1 - Final

CERTIFICATE OF ANALYSIS

MAXXAM JOB #: B587453
Received: 2015/10/05, 11:00

Sample Matrix: Water
Samples Received: 30

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Nitrogen - Nitrate (as N)	26	N/A	2015/10/07	BBY6SOP-00010	SM 22 4500-NO3- I m
Nitrogen - Nitrate (as N)	1	N/A	2015/10/08	BBY6SOP-00010	SM 22 4500-NO3- I m
Filter and HNO3 Preserve for Metals	30	N/A	2015/10/07	BBY7 WI-00004	BCMOE Reqs 08/14
pH Water (1)	27	N/A	2015/10/07	BBY6SOP-00026	SM 22 4500-H+ B m
Sulphate by Automated Colourimetry	22	N/A	2015/10/06	BBY6SOP-00017	SM 22 4500-SO42- E m
Sulphate by Automated Colourimetry	4	N/A	2015/10/07	BBY6SOP-00017	SM 22 4500-SO42- E m
Sulphate by Automated Colourimetry	1	N/A	2015/10/09	BBY6SOP-00017	SM 22 4500-SO42- E m
Total Dissolved Solids (Filt. Residue)	26	2015/10/06	2015/10/07	BBY6SOP-00033	SM 22 2540 C m
Total Dissolved Solids (Filt. Residue)	1	2015/10/08	2015/10/09	BBY6SOP-00033	SM 22 2540 C m
Total Suspended Solids-Low Level	12	2015/10/06	2015/10/07	BBY6SOP-00034	SM 22 2540 D
Total Suspended Solids-Low Level	9	2015/10/07	2015/10/07	BBY6SOP-00034	SM 22 2540 D

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.

* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.

(1) The BC-MOE and APHA Standard Method require pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the BC-MOE/APHA Standard Method holding time.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Morgan Melnychuk, Burnaby Project Manager
Email: MMelnychuk@maxxam.ca
Phone# (604)638-8034 Ext:8034

==========

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		NH5782			NH5783			NH5784		
Sampling Date		2015/09/29 11:00			2015/09/29 14:10			2015/09/29 09:15		
COC Number		08412388			08412388			08412388		
	UNITS	BC-1	RDL	QC Batch	BC-2	RDL	QC Batch	BC-6	RDL	QC Batch
Calculated Parameters										
Anion Sum	meq/L	4.4	N/A	8062538	3.9	N/A	8062538	2.9	N/A	8062538
Cation Sum	meq/L	4.3	N/A	8062538	4.1	N/A	8062538	3.1	N/A	8062538
Filter and HNO3 Preservation	N/A	LAB	N/A	8063468	LAB	N/A	8063468	LAB	N/A	8063468
Ion Balance	N/A	0.98	0.010	8062537	1.0	0.010	8062537	1.0	0.010	8062537
Nitrate (N)	mg/L	0.335	0.0020	8062947	2.68	0.010	8062947	0.0773	0.0020	8062947
Misc. Inorganics										
Strong Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	0.00050	8064498	0.00088	0.00050	8064498	<0.00050	0.00050	8064498
Weak Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	0.00050	8064499	<0.00050	0.00050	8064499	<0.00050	0.00050	8064499
Alkalinity (Total as CaCO3)	mg/L	106	0.50	8065730	65.5	0.50	8065742	86.3	0.50	8065730
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	8065730	<0.50	0.50	8065742	<0.50	0.50	8065730
Bicarbonate (HCO3)	mg/L	130	0.50	8065730	79.9	0.50	8065742	105	0.50	8065730
Carbonate (CO3)	mg/L	<0.50	0.50	8065730	<0.50	0.50	8065742	<0.50	0.50	8065730
Hydroxide (OH)	mg/L	<0.50	0.50	8065730	<0.50	0.50	8065742	<0.50	0.50	8065730
Anions										
Dissolved Sulphate (SO4)	mg/L	106	0.50	8065781	116	0.50	8064299	56.8	0.50	8064299
Dissolved Chloride (Cl)	mg/L	1.2	0.50	8064276	1.2	0.50	8064297	0.72	0.50	8064297
Nutrients										
Total Ammonia (N)	mg/L	0.014	0.0050	8065944	0.036	0.0050	8065944	0.0094	0.0050	8065944
Nitrate plus Nitrite (N)	mg/L	0.335 (1)	0.0020	8064551	2.68 (1)	0.010	8064553	0.0773 (1)	0.0020	8064553
Nitrite (N)	mg/L	<0.0020 (1)	0.0020	8064552	0.0046 (1)	0.0020	8064554	<0.0020 (1)	0.0020	8064554
Physical Properties										
Conductivity	uS/cm	392	1.0	8065734	396	1.0	8065745	292	1.0	8065734
pH	pH	8.05	N/A	8065736	7.87	N/A	8065747	8.00	N/A	8065736
Physical Properties										
Total Suspended Solids	mg/L	44.4	1.0	8063665	84.0	1.0	8063665	1.9	1.0	8063665
Total Dissolved Solids	mg/L	274	10	8063632	260	10	8063632	178	10	8063632

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Sample arrived to laboratory past recommended hold time.

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		NH5785		NH5786		NH5787		
Sampling Date		2015/09/29 11:55		2015/09/29 15:35		2015/09/29 09:36		
COC Number		08412388		08412388		08412388		
	UNITS	BC-31	QC Batch	BC-34	QC Batch	BC-39	RDL	QC Batch
Calculated Parameters								
Anion Sum	meq/L	5.0	8062538	4.6	8062538	2.7	N/A	8062538
Cation Sum	meq/L	5.2	8062538	4.8	8062538	2.8	N/A	8062538
Filter and HNO3 Preservation	N/A	LAB	8063468	LAB	8063468	LAB	N/A	8063468
Ion Balance	N/A	1.0	8062537	1.0	8062537	1.0	0.010	8062537
Nitrate (N)	mg/L	0.243	8062947	0.150	8062947	0.0643	0.0020	8062947
Misc. Inorganics								
Strong Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	8064498	<0.00050	8064498	<0.00050	0.00050	8064498
Weak Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	8064499	<0.00050	8064499	<0.00050	0.00050	8064499
Alkalinity (Total as CaCO3)	mg/L	137	8065742	122	8065742	79.7	0.50	8065730
Alkalinity (PP as CaCO3)	mg/L	<0.50	8065742	<0.50	8065742	<0.50	0.50	8065730
Bicarbonate (HCO3)	mg/L	168	8065742	149	8065742	97.3	0.50	8065730
Carbonate (CO3)	mg/L	<0.50	8065742	<0.50	8065742	<0.50	0.50	8065730
Hydroxide (OH)	mg/L	<0.50	8065742	<0.50	8065742	<0.50	0.50	8065730
Anions								
Dissolved Sulphate (SO4)	mg/L	104	8064280	102	8064299	54.3	0.50	8064280
Dissolved Chloride (Cl)	mg/L	0.68	8064276	0.76	8064297	0.67	0.50	8064276
Nutrients								
Total Ammonia (N)	mg/L	0.015	8065944	0.020	8065944	0.0099	0.0050	8065944
Nitrate plus Nitrite (N)	mg/L	0.243 (1)	8064551	0.153 (1)	8064553	0.0643 (1)	0.0020	8064551
Nitrite (N)	mg/L	<0.0020 (1)	8064552	0.0029 (1)	8064554	<0.0020 (1)	0.0020	8064552
Physical Properties								
Conductivity	uS/cm	469	8065745	436	8065745	273	1.0	8065734
pH	pH	8.13	8065747	8.10	8065747	7.94	N/A	8065736
Physical Properties								
Total Suspended Solids	mg/L	3.4	8063665	3.3	8063665	<1.0	1.0	8063665
Total Dissolved Solids	mg/L	332	8063632	296	8063632	156	10	8063632

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Sample arrived to laboratory past recommended hold time.

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		NH5788			NH5789		NH5790		
Sampling Date		2015/09/30 16:45			2015/09/29 10:15				
COC Number		08412388			08412388		08412388		
	UNITS	BC-51W	RDL	QC Batch	BC-53	QC Batch	BC-B	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	6.5	N/A	8062538	4.0	8062538	0.082	N/A	8062538
Cation Sum	meq/L	7.2	N/A	8062538	4.3	8062538	0.0015	N/A	8062538
Filter and HNO3 Preservation	N/A	LAB	N/A	8063468	LAB	8063468	LAB	N/A	8063468
Ion Balance	N/A	1.1	0.010	8062537	1.1	8062537	0.018 (1)	0.010	8062537
Nitrate (N)	mg/L	<0.0020	0.0020	8062947	0.326	8062947	<0.0020	0.0020	8062947
Misc. Inorganics									
Strong Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	0.00050	8064498	<0.00050	8064498	<0.00050	0.00050	8064498
Weak Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	0.00050	8064499	<0.00050	8064499	<0.00050	0.00050	8064499
Alkalinity (Total as CaCO3)	mg/L	<0.50	0.50	8065730	102	8065742	0.85	0.50	8065730
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	8065730	<0.50	8065742	<0.50	0.50	8065730
Bicarbonate (HCO3)	mg/L	<0.50	0.50	8065730	125	8065742	1.04	0.50	8065730
Carbonate (CO3)	mg/L	<0.50	0.50	8065730	<0.50	8065742	<0.50	0.50	8065730
Hydroxide (OH)	mg/L	<0.50	0.50	8065730	<0.50	8065742	<0.50	0.50	8065730
Anions									
Dissolved Sulphate (SO4)	mg/L	311	5.0	8069702	91.0	8064299	2.39	0.50	8064280
Dissolved Chloride (Cl)	mg/L	<0.50	0.50	8069692	0.76	8064297	0.52	0.50	8064276
Nutrients									
Total Ammonia (N)	mg/L	0.011	0.0050	8065944	0.017	8065944	0.0072	0.0050	8065944
Nitrate plus Nitrite (N)	mg/L	<0.0020 (2)	0.0020	8064551	0.326 (2)	8064553	<0.0020	0.0020	8064551
Nitrite (N)	mg/L	<0.0020 (2)	0.0020	8064552	<0.0020 (2)	8064554	<0.0020	0.0020	8064552
Physical Properties									
Conductivity	uS/cm	723	1.0	8065734	393	8065745	1.8	1.0	8065734
pH	pH	3.69	N/A	8065736	8.07	8065747	6.06	N/A	8065736
Physical Properties									
Total Suspended Solids	mg/L	3.0	1.0	8065187	15.0	8063665	<1.0	1.0	8063665
Total Dissolved Solids	mg/L	494 (3)	10	8067102	276	8063632	<10	10	8063632

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Ion balance out of optimal range due to high measurement uncertainty at this level (Ion Sum < 0.4 meq/L for both cations and anions).

(2) Sample arrived to laboratory past recommended hold time.
(3) Sample was originally analysed within hold time. Data quality required investigation. Re-analysis was completed past recommended hold time.

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		NH5791		NH5792			NH5799		
Sampling Date				2015/10/05 11:00			2015/10/01 14:45		
COC Number		08412388		08412388			08412389		
	UNITS	BC-A	QC Batch	TRIP BLANK	RDL	QC Batch	BC-19	RDL	QC Batch
Calculated Parameters									
Anion Sum	meq/L	5.0	8062538	0.012	N/A	8062538	14	N/A	8062538
Cation Sum	meq/L	5.0	8062538	0.0029	N/A	8062538	14	N/A	8062538
Filter and HNO3 Preservation	N/A	LAB	8063468	LAB	N/A	8063468	LAB	N/A	8063468
Ion Balance	N/A	1.0	8062537	0.24 (1)	0.010	8062537	1.0	0.010	8062537
Nitrate (N)	mg/L	0.201	8062947	0.0026	0.0020	8067176	0.334	0.0020	8062947
Misc. Inorganics									
Strong Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	8064498	<0.00050	0.00050	8064498	<0.00050	0.00050	8064498
Weak Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	8064499	<0.00050	0.00050	8064499	<0.00050	0.00050	8064499
Alkalinity (Total as CaCO3)	mg/L	138	8065742	<0.50	0.50	8065742	276	0.50	8065730
Alkalinity (PP as CaCO3)	mg/L	<0.50	8065742	<0.50	0.50	8065742	<0.50	0.50	8065730
Bicarbonate (HCO3)	mg/L	168	8065742	<0.50	0.50	8065742	337	0.50	8065730
Carbonate (CO3)	mg/L	<0.50	8065742	<0.50	0.50	8065742	<0.50	0.50	8065730
Hydroxide (OH)	mg/L	<0.50	8065742	<0.50	0.50	8065742	<0.50	0.50	8065730
Anions									
Dissolved Sulphate (SO4)	mg/L	105	8064299	0.56	0.50	8064299	392	5.0	8064280
Dissolved Chloride (Cl)	mg/L	0.65	8064297	<0.50	0.50	8064297	0.78	0.50	8064276
Nutrients									
Total Ammonia (N)	mg/L	0.011	8065944		0.0050		0.023	0.0050	8065944
Total Ammonia (N)	mg/L			<0.0050	0.0050	8065951			
Nitrate plus Nitrite (N)	mg/L	0.203	8064553	0.0026	0.0020	8067921	0.334 (2)	0.0020	8064551
Nitrite (N)	mg/L	0.0020	8064554	<0.0020	0.0020	8064554	<0.0020 (2)	0.0020	8064552
Physical Properties									
Conductivity	uS/cm	465	8065745	<1.0	1.0	8065745	1140	1.0	8065734
pH	pH	8.14	8065747	5.54	N/A	8065747	7.28	N/A	8065736
Physical Properties									
Total Suspended Solids	mg/L	4.1	8063665	<1.0	1.0	8065187			
Total Dissolved Solids	mg/L	302	8063632	<10	10	8063632	816	10	8063535

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Ion balance out of optimal range due to high measurement uncertainty at this level (Ion Sum < 0.4 meq/L for both cations and anions).

(2) Sample arrived to laboratory past recommended hold time.

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		NH5800			NH5801			NH5802		
Sampling Date		2015/09/30 16:44			2015/10/01 16:43			2015/09/30 11:15		
COC Number		08412389			08412389			08412389		
	UNITS	BC-21	RDL	QC Batch	BC-22	RDL	QC Batch	BC-27	RDL	QC Batch
Calculated Parameters										
Anion Sum	meq/L	16	N/A	8062538	15	N/A	8062538	8.6	N/A	8062538
Cation Sum	meq/L	13	N/A	8062538	16	N/A	8062538	9.3	N/A	8062538
Filter and HNO3 Preservation	N/A	LAB	N/A	8063468	LAB	N/A	8063468	LAB	N/A	8063468
Ion Balance	N/A	0.83 (1)	0.010	8062537	1.0	0.010	8062537	1.1	0.010	8062537
Nitrate (N)	mg/L	<0.0020	0.0020	8062947	6.70	0.020	8062947	0.0027	0.0020	8062947
Misc. Inorganics										
Strong Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	0.00050	8064498	<0.00050	0.00050	8064498	<0.00050	0.00050	8064498
Weak Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	0.00050	8064499	<0.00050	0.00050	8064499	<0.00050	0.00050	8064499
Alkalinity (Total as CaCO3)	mg/L	291	0.50	8065730	175	0.50	8065730	171	0.50	8065730
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	8065730	<0.50	0.50	8065730	<0.50	0.50	8065730
Bicarbonate (HCO3)	mg/L	355	0.50	8065730	214	0.50	8065730	209	0.50	8065730
Carbonate (CO3)	mg/L	<0.50	0.50	8065730	<0.50	0.50	8065730	<0.50	0.50	8065730
Hydroxide (OH)	mg/L	<0.50	0.50	8065730	<0.50	0.50	8065730	<0.50	0.50	8065730
Anions										
Dissolved Sulphate (SO4)	mg/L	478	5.0	8064280	540	5.0	8064280	246	5.0	8064280
Dissolved Chloride (Cl)	mg/L	2.3	0.50	8069692	2.0	0.50	8064276	0.88	0.50	8064276
Nutrients										
Total Ammonia (N)	mg/L	0.19	0.0050	8065944	0.018	0.0050	8065944	0.050	0.0050	8065946
Nitrate plus Nitrite (N)	mg/L	<0.0020 (2)	0.0020	8064551	6.70 (2)	0.020	8064551	0.0027 (2)	0.0020	8064551
Nitrite (N)	mg/L	<0.0020 (2)	0.0020	8064552	0.0026 (2)	0.0020	8064552	<0.0020 (2)	0.0020	8064552
Physical Properties										
Conductivity	uS/cm	1300	1.0	8065734	1310	1.0	8065734	812	1.0	8065734
pH	pH	7.56	N/A	8065736	6.62	N/A	8065736	7.97	N/A	8065736
Physical Properties										
Total Dissolved Solids	mg/L	964	10	8063535	1050	10	8063535	584	10	8063535

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Anion - Cation balance exceeds normal acceptance limits, major ions reanalyzed, possible matrix interference
(2) Sample arrived to laboratory past recommended hold time.

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Maxxam Job #: B587453
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Alexco Environmental Group Inc.
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RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		NH5803			NH5804			NH5805		
Sampling Date		2015/10/01 13:58			2015/10/01 12:05			2015/09/30 13:05		
COC Number		08412389			08412389			08412389		
	UNITS	BC-65	RDL	QC Batch	BC-66	RDL	QC Batch	BC-67	RDL	QC Batch
Calculated Parameters										
Anion Sum	meq/L	1.1	N/A	8062538	6.8	N/A	8062538	4.2	N/A	8062538
Cation Sum	meq/L	1.1	N/A	8062538	7.5	N/A	8062538	3.7	N/A	8062538
Filter and HNO3 Preservation	N/A	LAB	N/A	8063468	LAB	N/A	8063468	LAB	N/A	8063468
Ion Balance	N/A	0.99	0.010	8062537	1.1	0.010	8062537	0.89	0.010	8062537
Nitrate (N)	mg/L	1.20	0.0020	8062947	21.7	0.040	8062947	1.31	0.0020	8062947
Misc. Inorganics										
Strong Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	0.00050	8064498	0.00338	0.00050	8064498	<0.00050	0.00050	8064498
Weak Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	0.00050	8064499	0.00124	0.00050	8064499	<0.00050	0.00050	8064499
Alkalinity (Total as CaCO3)	mg/L	39.4	0.50	8065730	233	0.50	8065730	155	0.50	8065730
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	8065730	<0.50	0.50	8065730	<0.50	0.50	8065730
Bicarbonate (HCO3)	mg/L	48.1	0.50	8065730	285	0.50	8065730	189	0.50	8065730
Carbonate (CO3)	mg/L	<0.50	0.50	8065730	<0.50	0.50	8065730	<0.50	0.50	8065730
Hydroxide (OH)	mg/L	<0.50	0.50	8065730	<0.50	0.50	8065730	<0.50	0.50	8065730
Anions										
Dissolved Sulphate (SO4)	mg/L	7.46	0.50	8064280	23.0	0.50	8064280	38.7	0.50	8064299
Dissolved Chloride (Cl)	mg/L	1.4	0.50	8064276	5.1	0.50	8064276	6.8	0.50	8064297
Nutrients										
Total Ammonia (N)	mg/L	0.018	0.0050	8065946	0.0079	0.0050	8065943	0.022	0.0050	8065943
Nitrate plus Nitrite (N)	mg/L	1.20 (1)	0.0020	8064551	21.7 (1)	0.040	8064551	1.32 (1)	0.0020	8064553
Nitrite (N)	mg/L	<0.0020 (1)	0.0020	8064552	0.0021 (1)	0.0020	8064552	0.0139 (1)	0.0020	8064554
Physical Properties										
Conductivity	uS/cm	107	1.0	8065734	721	1.0	8065734	401	1.0	8065734
pH	pH	6.97	N/A	8065736	8.11	N/A	8065736	7.44	N/A	8065736
Physical Properties										
Total Dissolved Solids	mg/L	66	10	8063535	454	10	8063535	220	10	8063535

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Sample arrived to laboratory past recommended hold time.

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Maxxam Job #: B587453
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Alexco Environmental Group Inc.
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RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		NH5806			NH5807			NH5814		
Sampling Date		2015/09/30 14:12						2015/09/30 12:01		
COC Number		08412389			08412389			08412390		
	UNITS	BC-69	RDL	QC Batch	BC-C	RDL	QC Batch	BC-10	RDL	QC Batch
Calculated Parameters										
Anion Sum	meq/L	9.3	N/A	8062538	16	N/A	8062538		N/A	8062538
Cation Sum	meq/L	9.0	N/A	8062538	14	N/A	8062538		N/A	8062538
Filter and HNO3 Preservation	N/A	LAB	N/A	8063468	LAB	N/A	8063468	LAB	N/A	8063468
Ion Balance	N/A	0.96	0.010	8062537	0.90	0.010	8062537		0.010	8062537
Nitrate (N)	mg/L	0.0029	0.0020	8062947	<0.0020	0.0020	8062947	<0.0020	0.0020	8062947
Misc. Inorganics										
Strong Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	0.00050	8065639	<0.00050	0.00050	8065639		0.00050	8065639
Weak Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	0.00050	8065645	<0.00050	0.00050	8065645		0.00050	8065645
Alkalinity (Total as CaCO3)	mg/L	331	0.50	8065730	293	0.50	8065730	134	0.50	8065730
Alkalinity (PP as CaCO3)	mg/L	<0.50	0.50	8065730	<0.50	0.50	8065730	<0.50	0.50	8065730
Bicarbonate (HCO3)	mg/L	404	0.50	8065730	357	0.50	8065730	164	0.50	8065730
Carbonate (CO3)	mg/L	<0.50	0.50	8065730	<0.50	0.50	8065730	<0.50	0.50	8065730
Hydroxide (OH)	mg/L	<0.50	0.50	8065730	<0.50	0.50	8065730	<0.50	0.50	8065730
Anions										
Dissolved Sulphate (SO4)	mg/L	127	0.50	8065781	468	5.0	8064280	111	0.50	8064280
Dissolved Chloride (Cl)	mg/L	2.1	0.50	8064276	2.4	0.50	8064276			8064276
Nutrients										
Total Ammonia (N)	mg/L	0.027	0.0050	8065944	0.17	0.0050	8065944	0.0071	0.0050	8065943
Nitrate plus Nitrite (N)	mg/L	0.0029 (1)	0.0020	8064551	<0.0020	0.0020	8064551	<0.0020 (1)	0.0020	8064551
Nitrite (N)	mg/L	<0.0020 (1)	0.0020	8064552	<0.0020	0.0020	8064552	<0.0020 (1)	0.0020	8064552
Physical Properties										
Conductivity	uS/cm	781	1.0	8065734	1310	1.0	8065734	460	1.0	8065734
pH	pH	7.94	N/A	8065736	7.58	N/A	8065736	8.16	N/A	8065736
Physical Properties										
Total Suspended Solids	mg/L							1.3	1.0	8065187
Total Dissolved Solids	mg/L	462	10	8063632	1040	10	8063632	310	10	8063632

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Sample arrived to laboratory past recommended hold time.

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		NH5815		NH5816			NH5817		
Sampling Date		2015/09/30 14:41		2015/09/30 15:15			2015/09/30 11:45		
COC Number		08412390		08412390			08412390		
	UNITS	BC-12	QC Batch	BC-15	RDL	QC Batch	BC-17	RDL	QC Batch
Calculated Parameters									
Filter and HNO3 Preservation	N/A	LAB	8063468	LAB	N/A	8063468	LAB	N/A	8063468
Nitrate (N)	mg/L	0.0157	8062947	0.0248	0.0020	8062947	1.15	0.0020	8062947
Misc. Inorganics									
Alkalinity (Total as CaCO3)	mg/L	159	8065742	125	0.50	8065730	121	0.50	8065730
Alkalinity (PP as CaCO3)	mg/L	<0.50	8065742	<0.50	0.50	8065730	<0.50	0.50	8065730
Bicarbonate (HCO3)	mg/L	193	8065742	152	0.50	8065730	148	0.50	8065730
Carbonate (CO3)	mg/L	<0.50	8065742	<0.50	0.50	8065730	<0.50	0.50	8065730
Hydroxide (OH)	mg/L	<0.50	8065742	<0.50	0.50	8065730	<0.50	0.50	8065730
Anions									
Dissolved Sulphate (SO4)	mg/L	397	8064872	389	5.0	8064280	84.8	0.50	8065781
Nutrients									
Total Ammonia (N)	mg/L	0.023	8065944	0.018	0.0050	8065944	0.0099	0.0050	8065943
Nitrate plus Nitrite (N)	mg/L	0.0157	8064553	0.0248 (1)	0.0020	8064551	1.15 (1)	0.0020	8064551
Nitrite (N)	mg/L	<0.0020 (1)	8064554	<0.0020 (1)	0.0020	8064552	<0.0020 (1)	0.0020	8064552
Physical Properties									
Conductivity	uS/cm	983	8065745	953	1.0	8065734	390	1.0	8065734
pH	pH	7.72	8065747	8.07	N/A	8065736	8.03	N/A	8065736
Physical Properties									
Total Suspended Solids	mg/L	5.8	8065187	1.6	1.0	8065187	<1.0	1.0	8065187
Total Dissolved Solids	mg/L	718	8063632	732	10	8063632	250	10	8063632

RDL = Reportable Detection Limit
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Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		NH5829		NH5830		NH5831		NH5832		
Sampling Date		2015/09/29 13:32		2015/09/29 12:52		2015/09/29 14:52		2015/10/01 16:26		
COC Number		08412391		08412391		08412391		08412392		
	UNITS	BC-3	QC Batch	BC-4	QC Batch	BC-5	QC Batch	BC-28	RDL	QC Batch
Calculated Parameters										
Anion Sum	meq/L	4.3	8062538	6.3	8062538	4.7	8062538		N/A	8062538
Cation Sum	meq/L	4.4	8062538	6.1	8062538	4.6	8062538		N/A	8062538
Filter and HNO3 Preservation	N/A	LAB	8063468	LAB	8063468	LAB	8063468	LAB	N/A	8063468
Ion Balance	N/A	1.0	8062537	0.96	8062537	0.99	8062537		0.010	8062537
Nitrate (N)	mg/L	0.191	8062947	0.182	8062947	0.0629	8062947		0.0020	8062947
Misc. Inorganics										
Strong Acid Dissoc. Cyanide (CN)	mg/L		8065639		8065639		8065639	<0.00050	0.00050	8065639
Weak Acid Dissoc. Cyanide (CN)	mg/L		8065645		8065645		8065645	<0.00050	0.00050	8065645
Alkalinity (Total as CaCO3)	mg/L	109	8065742	132	8065730	116	8065742		0.50	8065742
Alkalinity (PP as CaCO3)	mg/L	<0.50	8065742	<0.50	8065730	<0.50	8065742		0.50	8065742
Bicarbonate (HCO3)	mg/L	133	8065742	161	8065730	142	8065742		0.50	8065742
Carbonate (CO3)	mg/L	<0.50	8065742	<0.50	8065730	<0.50	8065742		0.50	8065742
Hydroxide (OH)	mg/L	<0.50	8065742	<0.50	8065730	<0.50	8065742		0.50	8065742
Anions										
Dissolved Sulphate (SO4)	mg/L	100	8064872	175	8065781	111	8064299		0.50	8064299
Dissolved Chloride (Cl)	mg/L	0.96	8064871	0.80	8064276	0.91	8064297		0.50	8064297
Nutrients										
Total Ammonia (N)	mg/L	0.013	8065944	0.021	8065943	0.011	8065943	0.011	0.0050	8065944
Nitrate plus Nitrite (N)	mg/L	0.191 (1)	8064553	0.182 (1)	8064551	0.0651 (1)	8064553		0.0020	
Nitrite (N)	mg/L	<0.0020 (1)	8064554	<0.0020 (1)	8064552	0.0022 (1)	8064554		0.0020	
Physical Properties										
Conductivity	uS/cm	404	8065745	572	8065734	436	8065745		1.0	
pH	pH	8.03	8065747	8.11	8065736	8.09	8065747		N/A	
Physical Properties										
Total Suspended Solids	mg/L	14.6	8063665	32.5	8063665	2.5	8063665	3.7	1.0	8065187
Total Dissolved Solids	mg/L	258	8063632	366	8063632	302	8063632		10	

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Sample arrived to laboratory past recommended hold time.

Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

RESULTS OF CHEMICAL ANALYSES OF WATER

Maxxam ID		NH5833			NH5834		
Sampling Date		2015/10/01 15:47			2015/10/01 16:05		
COC Number		08412392			08412392		
	UNITS	**BC-28A**	**RDL**	**QC Batch**	**BC-28B**	**RDL**	**QC Batch**
Calculated Parameters							
Filter and HNO3 Preservation	N/A	LAB	N/A	8063468	LAB	N/A	8063468
Misc. Inorganics							
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.434	0.0050	8065639	0.0603	0.00050	8065639
Weak Acid Dissoc. Cyanide (CN)	mg/L	0.0355	0.00050	8065645	0.0474	0.00050	8065645
Nutrients							
Total Ammonia (N)	mg/L	0.012	0.0050	8065944	0.12	0.0050	8065943
Physical Properties							
Total Suspended Solids	mg/L	1.5	1.0	8065187	1.4	1.0	8065187

RDL = Reportable Detection Limit
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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		NH5782	NH5783	NH5784		NH5785		
Sampling Date		2015/09/29 11:00	2015/09/29 14:10	2015/09/29 09:15		2015/09/29 11:55		
COC Number		08412388	08412388	08412388		08412388		
	UNITS	BC-1	BC-2	BC-6	QC Batch	BC-31	RDL	QC Batch
Misc. Inorganics								
Dissolved Hardness (CaCO3)	mg/L	204	182	149	8062373	253	0.50	8062373
Elements								
Dissolved Mercury (Hg)	mg/L	<0.0000020	0.0000021	<0.0000020	8065644	0.0000026	0.0000020	8065644
Dissolved Metals by ICPMS								
Dissolved Aluminum (Al)	mg/L	0.0308	0.0373	0.00495	8063995	0.0173	0.00050	8063995
Dissolved Antimony (Sb)	mg/L	0.00316	0.000786	0.000176	8063995	0.000628	0.000020	8063995
Dissolved Arsenic (As)	mg/L	0.00311	0.000542	0.000544	8063995	0.000501	0.000020	8063995
Dissolved Barium (Ba)	mg/L	0.0571	0.0731	0.0525	8063995	0.0588	0.000020	8063995
Dissolved Beryllium (Be)	mg/L	0.000024	0.000016	<0.000010	8063995	<0.000010	0.000010	8063995
Dissolved Bismuth (Bi)	mg/L	<0.0000050	<0.0000050	<0.0000050	8063995	<0.0000050	0.0000050	8063995
Dissolved Boron (B)	mg/L	<0.010	<0.010	<0.010	8063995	0.014	0.010	8063995
Dissolved Cadmium (Cd)	mg/L	0.0000220	0.0000100	0.0000330	8063995	0.0000420	0.0000050	8063995
Dissolved Chromium (Cr)	mg/L	0.00018	0.00027	<0.00010	8063995	0.00013	0.00010	8063995
Dissolved Cobalt (Co)	mg/L	0.00104	0.00782	0.0000220	8063995	0.0000650	0.0000050	8063995
Dissolved Copper (Cu)	mg/L	0.00140	0.00148	0.000645	8063995	0.00146	0.000050	8063995
Dissolved Iron (Fe)	mg/L	0.111	0.184	0.0136	8063995	0.0510	0.0010	8063995
Dissolved Lead (Pb)	mg/L	0.0000170	0.0000280	<0.0000050	8063995	0.0000050	0.0000050	8063995
Dissolved Lithium (Li)	mg/L	0.00953	0.00819	0.00226	8063995	0.00454	0.00050	8063995
Dissolved Manganese (Mn)	mg/L	0.0350	0.0649	0.00538	8063995	0.0107	0.000050	8063995
Dissolved Molybdenum (Mo)	mg/L	0.00226	0.000284	0.000607	8063995	0.00149	0.000050	8063995
Dissolved Nickel (Ni)	mg/L	0.00256	0.00167	0.000856	8063995	0.00215	0.000020	8063995
Dissolved Phosphorus (P)	mg/L	0.0093	0.0155	0.0031	8063995	0.0063	0.0020	8063995
Dissolved Selenium (Se)	mg/L	0.00212	0.00300	0.000795	8063995	0.00194	0.000040	8067593
Dissolved Silicon (Si)	mg/L	5.17	5.86	2.91	8063995	3.77	0.050	8063995
Dissolved Silver (Ag)	mg/L	<0.0000050	<0.0000050	<0.0000050	8063995	<0.0000050	0.0000050	8063995
Dissolved Strontium (Sr)	mg/L	0.232	0.131	0.225	8063995	0.293	0.000050	8063995
Dissolved Thallium (Tl)	mg/L	0.0000020	<0.0000020	<0.0000020	8063995	0.0000020	0.0000020	8063995
Dissolved Tin (Sn)	mg/L	<0.00020	<0.00020	<0.00020	8063995	<0.00020	0.00020	8063995
Dissolved Titanium (Ti)	mg/L	0.00053	0.00084	<0.00050	8063995	<0.00050	0.00050	8063995
Dissolved Uranium (U)	mg/L	0.00167	0.000498	0.000831	8063995	0.00219	0.0000020	8063995
Dissolved Vanadium (V)	mg/L	0.00078	0.00046	<0.00020	8063995	0.00062	0.00020	8063995
Dissolved Zinc (Zn)	mg/L	0.00142	0.00059	0.00228	8063995	0.00330	0.00010	8063995
Dissolved Zirconium (Zr)	mg/L	0.00023	0.00047	<0.00010	8063995	0.00015	0.00010	8063995
Dissolved Calcium (Ca)	mg/L	49.5	42.5	39.7	8062539	59.9	0.050	8062539
Dissolved Magnesium (Mg)	mg/L	19.4	18.5	12.0	8062539	25.2	0.050	8062539
Dissolved Potassium (K)	mg/L	1.15	0.946	0.508	8062539	0.861	0.050	8062539

RDL = Reportable Detection Limit

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		NH5782	NH5783	NH5784		NH5785		
Sampling Date		2015/09/29 11:00	2015/09/29 14:10	2015/09/29 09:15		2015/09/29 11:55		
COC Number		08412388	08412388	08412388		08412388		
	UNITS	**BC-1**	**BC-2**	**BC-6**	**QC Batch**	**BC-31**	**RDL**	**QC Batch**
Dissolved Sodium (Na)	mg/L	3.90	10.3	2.14	8062539	1.98	0.050	8062539
Dissolved Sulphur (S)	mg/L	32.3	39.3	20.9	8062539	35.0	3.0	8062539
RDL = Reportable Detection Limit								

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		NH5786	NH5787		NH5788		
Sampling Date		2015/09/29 15:35	2015/09/29 09:36		2015/09/30 16:45		
COC Number		08412388	08412388		08412388		
	UNITS	BC-34	BC-39	QC Batch	BC-51W	RDL	QC Batch
Misc. Inorganics							
Dissolved Hardness (CaCO3)	mg/L	236	132	8062373	305	0.50	8068327
Elements							
Dissolved Mercury (Hg)	mg/L	0.0000028	<0.0000020	8065644	0.0000038	0.0000020	8065644
Dissolved Metals by ICPMS							
Dissolved Aluminum (Al)	mg/L	0.00785	0.00146	8063995	4.89	0.00050	8063995
Dissolved Antimony (Sb)	mg/L	0.000233	0.000250	8063995	0.00290	0.000020	8063995
Dissolved Arsenic (As)	mg/L	0.000205	0.000298	8063995	0.0176	0.000020	8063995
Dissolved Barium (Ba)	mg/L	0.0452	0.0718	8063995	0.0371	0.000020	8063995
Dissolved Beryllium (Be)	mg/L	<0.000010	<0.000010	8063995	0.0128	0.000010	8063995
Dissolved Bismuth (Bi)	mg/L	<0.0000050	<0.0000050	8063995	<0.0000050	0.0000050	8063995
Dissolved Boron (B)	mg/L	0.011	<0.010	8063995	0.017	0.010	8063995
Dissolved Cadmium (Cd)	mg/L	0.0000770	0.0000340	8063995	0.00408	0.0000050	8063995
Dissolved Chromium (Cr)	mg/L	0.00011	<0.00010	8063995	0.00131	0.00010	8063995
Dissolved Cobalt (Co)	mg/L	0.0000260	0.0000220	8063995	0.0501	0.0000050	8063995
Dissolved Copper (Cu)	mg/L	0.00138	0.000558	8063995	0.237	0.000050	8063995
Dissolved Iron (Fe)	mg/L	0.0225	<0.0010	8063995	5.55	0.0010	8063995
Dissolved Lead (Pb)	mg/L	<0.0000050	<0.0000050	8063995	0.000131	0.0000050	8063995
Dissolved Lithium (Li)	mg/L	0.00236	0.00149	8063995	0.0129	0.00050	8063995
Dissolved Manganese (Mn)	mg/L	0.00469	0.000506	8063995	2.20	0.000050	8063995
Dissolved Molybdenum (Mo)	mg/L	0.00148	0.000667	8063995	<0.000050	0.000050	8063995
Dissolved Nickel (Ni)	mg/L	0.00238	0.000448	8063995	0.149	0.000020	8063995
Dissolved Phosphorus (P)	mg/L	0.0063	0.0031	8063995	0.0020	0.0020	8063995
Dissolved Selenium (Se)	mg/L	0.00245	0.000581	8063995	0.00439	0.000040	8063995
Dissolved Silicon (Si)	mg/L	3.33	2.93	8063995	10.0	0.050	8063995
Dissolved Silver (Ag)	mg/L	<0.0000050	<0.0000050	8063995	0.0000050	0.0000050	8063995
Dissolved Strontium (Sr)	mg/L	0.234	0.204	8063995	0.422	0.000050	8063995
Dissolved Thallium (Tl)	mg/L	0.0000020	<0.0000020	8063995	0.000102	0.0000020	8063995
Dissolved Tin (Sn)	mg/L	<0.00020	<0.00020	8063995	<0.00020	0.00020	8063995
Dissolved Titanium (Ti)	mg/L	<0.00050	<0.00050	8063995	<0.00050	0.00050	8063995
Dissolved Uranium (U)	mg/L	0.00136	0.000753	8063995	0.00436	0.0000020	8063995
Dissolved Vanadium (V)	mg/L	0.00068	<0.00020	8063995	<0.00020	0.00020	8063995
Dissolved Zinc (Zn)	mg/L	0.00740	0.00154	8063995	0.393	0.00010	8063995
Dissolved Zirconium (Zr)	mg/L	<0.00010	<0.00010	8063995	<0.00010	0.00010	8063995
Dissolved Calcium (Ca)	mg/L	57.6	35.8	8062539	63.6	0.050	8068329
Dissolved Magnesium (Mg)	mg/L	22.3	10.4	8062539	35.4	0.050	8068329
Dissolved Potassium (K)	mg/L	0.699	0.613	8062539	2.11	0.050	8068329
RDL = Reportable Detection Limit							

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Maxxam Job #: B587453
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Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		NH5786	NH5787		NH5788		
Sampling Date		2015/09/29 15:35	2015/09/29 09:36		2015/09/30 16:45		
COC Number		08412388	08412388		08412388		
	UNITS	**BC-34**	**BC-39**	**QC Batch**	**BC-51W**	**RDL**	**QC Batch**
Dissolved Sodium (Na)	mg/L	1.50	2.20	8062539	0.849	0.050	8068329
Dissolved Sulphur (S)	mg/L	35.2	18.5	8062539	116	3.0	8068329
RDL = Reportable Detection Limit							

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Report Date: 2015/10/13

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LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		NH5789	NH5790	NH5791	NH5792	NH5799		
Sampling Date		2015/09/29 10:15			2015/10/05 11:00	2015/10/01 14:45		
COC Number		08412388	08412388	08412388	08412388	08412389		
	UNITS	BC-53	BC-B	BC-A	TRIP BLANK	BC-19	RDL	QC Batch
Misc. Inorganics								
Dissolved Hardness (CaCO3)	mg/L	206	<0.50	243	<0.50	665	0.50	8062373
Elements								
Dissolved Mercury (Hg)	mg/L	<0.0000020	<0.0000020	0.0000031	<0.0000020	<0.0000020	0.0000020	8065644
Dissolved Metals by ICPMS								
Dissolved Aluminum (Al)	mg/L	0.0315	0.00140	0.0180	<0.00050	0.00252	0.00050	8063995
Dissolved Antimony (Sb)	mg/L	0.00312	<0.000020	0.000638	<0.000020	0.000188	0.000020	8063995
Dissolved Arsenic (As)	mg/L	0.00302	<0.000020	0.000515	<0.000020	0.000431	0.000020	8063995
Dissolved Barium (Ba)	mg/L	0.0578	<0.000020	0.0608	<0.000020	0.00230	0.000020	8063995
Dissolved Beryllium (Be)	mg/L	0.000022	<0.000010	<0.000010	<0.000010	<0.000010	0.000010	8063995
Dissolved Bismuth (Bi)	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000050	8063995
Dissolved Boron (B)	mg/L	0.011	<0.010	0.012	<0.010	0.025	0.010	8063995
Dissolved Cadmium (Cd)	mg/L	0.0000210	<0.0000050	0.0000410	<0.0000050	0.000601	0.0000050	8063995
Dissolved Chromium (Cr)	mg/L	0.00018	<0.00010	0.00014	<0.00010	0.00018	0.00010	8063995
Dissolved Cobalt (Co)	mg/L	0.000996	<0.0000050	0.0000620	<0.0000050	0.000618	0.0000050	8063995
Dissolved Copper (Cu)	mg/L	0.00139	0.000085	0.00137	<0.000050	0.000289	0.000050	8063995
Dissolved Iron (Fe)	mg/L	0.108	<0.0010	0.0499	<0.0010	0.0048	0.0010	8063995
Dissolved Lead (Pb)	mg/L	0.0000190	<0.0000050	0.0000100	<0.0000050	0.0000130	0.0000050	8063995
Dissolved Lithium (Li)	mg/L	0.00953	<0.00050	0.00548	<0.00050	0.0373	0.00050	8063995
Dissolved Manganese (Mn)	mg/L	0.0321	0.000056	0.0101	<0.000050	0.289	0.000050	8063995
Dissolved Molybdenum (Mo)	mg/L	0.00226	<0.000050	0.00153	<0.000050	0.000062	0.000050	8063995
Dissolved Nickel (Ni)	mg/L	0.00252	0.000038	0.00198	<0.000020	0.00246	0.000020	8063995
Dissolved Phosphorus (P)	mg/L	0.0084	<0.0020	0.0054	<0.0020	0.0227	0.0020	8063995
Dissolved Selenium (Se)	mg/L	0.00208	<0.000040	0.00204	<0.000040	0.00768	0.000040	8063995
Dissolved Silicon (Si)	mg/L	4.90	<0.050	3.64	<0.050	7.41	0.050	8063995
Dissolved Silver (Ag)	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000050	8063995
Dissolved Strontium (Sr)	mg/L	0.222	<0.000050	0.278	<0.000050	0.519	0.000050	8063995
Dissolved Thallium (Tl)	mg/L	0.0000080	<0.0000020	0.0000050	<0.0000020	0.0000070	0.0000020	8063995
Dissolved Tin (Sn)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	8063995
Dissolved Titanium (Ti)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8063995
Dissolved Uranium (U)	mg/L	0.00162	<0.0000020	0.00228	<0.0000020	0.000988	0.0000020	8063995
Dissolved Vanadium (V)	mg/L	0.00083	<0.00020	0.00067	<0.00020	<0.00020	0.00020	8063995
Dissolved Zinc (Zn)	mg/L	0.00132	0.00010	0.00312	<0.00010	0.0268	0.00010	8063995
Dissolved Zirconium (Zr)	mg/L	0.00022	<0.00010	0.00014	<0.00010	<0.00010	0.00010	8063995
Dissolved Calcium (Ca)	mg/L	50.9	<0.050	57.8	<0.050	149	0.050	8062539
Dissolved Magnesium (Mg)	mg/L	19.2	<0.050	23.9	<0.050	71.4	0.050	8062539
Dissolved Potassium (K)	mg/L	1.12	<0.050	0.813	<0.050	2.62	0.050	8062539

RDL = Reportable Detection Limit

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		NH5789	NH5790	NH5791	NH5792	NH5799		
Sampling Date		2015/09/29 10:15			2015/10/05 11:00	2015/10/01 14:45		
COC Number		08412388	08412388	08412388	08412388	08412389		
	UNITS	**BC-53**	**BC-B**	**BC-A**	**TRIP BLANK**	**BC-19**	**RDL**	**QC Batch**
Dissolved Sodium (Na)	mg/L	3.75	<0.050	1.81	<0.050	11.3	0.050	8062539
Dissolved Sulphur (S)	mg/L	31.1	<3.0	33.9	<3.0	142	3.0	8062539
RDL = Reportable Detection Limit								

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		NH5800		NH5801	NH5802	NH5803		
Sampling Date		2015/09/30 16:44		2015/10/01 16:43	2015/09/30 11:15	2015/10/01 13:58		
COC Number		08412389		08412389	08412389	08412389		
	UNITS	BC-21	QC Batch	BC-22	BC-27	BC-65	RDL	QC Batch
Misc. Inorganics								
Dissolved Hardness (CaCO3)	mg/L	627	8068327	749	461	45.6	0.50	8062373
Elements								
Dissolved Mercury (Hg)	mg/L	<0.0000020	8065644	<0.0000020	<0.0000020	<0.0000020	0.0000020	8065644
Dissolved Metals by ICPMS								
Dissolved Aluminum (Al)	mg/L	0.00088	8063995	0.142	<0.00050	0.00850	0.00050	8064011
Dissolved Antimony (Sb)	mg/L	0.000198	8063995	0.000048	0.00214	0.00347	0.000020	8064011
Dissolved Arsenic (As)	mg/L	0.0225	8063995	0.000195	0.0652	0.000377	0.000020	8064011
Dissolved Barium (Ba)	mg/L	0.0198	8063995	0.0203	0.0107	0.153	0.000020	8064011
Dissolved Beryllium (Be)	mg/L	<0.000010	8063995	0.000088	<0.000010	<0.000010	0.000010	8064011
Dissolved Bismuth (Bi)	mg/L	<0.0000050	8063995	<0.0000050	<0.0000050	<0.0000050	0.0000050	8064011
Dissolved Boron (B)	mg/L	0.035	8063995	0.041	0.011	<0.010	0.010	8064011
Dissolved Cadmium (Cd)	mg/L	0.0000350	8063995	0.00668	0.0000230	0.0000730	0.0000050	8064011
Dissolved Chromium (Cr)	mg/L	<0.00010	8063995	<0.00010	<0.00010	0.00086	0.00010	8064011
Dissolved Cobalt (Co)	mg/L	0.00457	8063995	0.00425	0.000178	0.000194	0.0000050	8064011
Dissolved Copper (Cu)	mg/L	0.000201	8063995	0.000606	<0.000050	0.00404	0.000050	8064011
Dissolved Iron (Fe)	mg/L	0.111	8063995	0.126	0.0277	0.0113	0.0010	8064011
Dissolved Lead (Pb)	mg/L	0.0000170	8063995	0.0000220	0.0000070	0.0000130	0.0000050	8064011
Dissolved Lithium (Li)	mg/L	0.0372	8063995	0.0525	0.0102	0.00314	0.00050	8064011
Dissolved Manganese (Mn)	mg/L	1.92	8063995	0.334	0.224	0.00444	0.000050	8064011
Dissolved Molybdenum (Mo)	mg/L	0.000273	8063995	0.000208	0.0122	0.000442	0.000050	8064011
Dissolved Nickel (Ni)	mg/L	0.00660	8063995	0.0601	0.00204	0.00520	0.000020	8064011
Dissolved Phosphorus (P)	mg/L	<0.0020	8063995	0.0575	<0.0020	0.0370	0.0020	8064011
Dissolved Selenium (Se)	mg/L	0.000237	8063995	0.0868	<0.000040	0.00270	0.000040	8064011
Dissolved Silicon (Si)	mg/L	5.57	8063995	15.5	4.06	6.97	0.050	8064011
Dissolved Silver (Ag)	mg/L	<0.0000050	8063995	<0.0000050	<0.0000050	<0.0000050	0.0000050	8064011
Dissolved Strontium (Sr)	mg/L	0.494	8063995	0.426	0.767	0.0704	0.000050	8064011
Dissolved Thallium (Tl)	mg/L	0.0000260	8063995	0.0000250	0.0000040	0.0000050	0.0000020	8064011
Dissolved Tin (Sn)	mg/L	<0.00020	8063995	<0.00020	<0.00020	<0.00020	0.00020	8064011
Dissolved Titanium (Ti)	mg/L	<0.00050	8063995	<0.00050	<0.00050	<0.00050	0.00050	8064011
Dissolved Uranium (U)	mg/L	0.00293	8063995	0.000851	0.0131	0.0000180	0.0000020	8064011
Dissolved Vanadium (V)	mg/L	<0.00020	8063995	<0.00020	<0.00020	0.00023	0.00020	8064011
Dissolved Zinc (Zn)	mg/L	0.136	8063995	0.133	0.0260	0.0185	0.00010	8064011
Dissolved Zirconium (Zr)	mg/L	<0.00010	8063995	<0.00010	<0.00010	<0.00010	0.00010	8064011
Dissolved Calcium (Ca)	mg/L	132	8062539	181	113	12.0	0.050	8062539
Dissolved Magnesium (Mg)	mg/L	72.2	8068329	72.3	43.1	3.82	0.050	8062539
Dissolved Potassium (K)	mg/L	3.36	8068329	3.82	1.51	1.32	0.050	8062539
RDL = Reportable Detection Limit								

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		NH5800		NH5801	NH5802	NH5803		
Sampling Date		2015/09/30 16:44		2015/10/01 16:43	2015/09/30 11:15	2015/10/01 13:58		
COC Number		08412389		08412389	08412389	08412389		
	UNITS	**BC-21**	**QC Batch**	**BC-22**	**BC-27**	**BC-65**	**RDL**	**QC Batch**
Dissolved Sodium (Na)	mg/L	8.15	8068329	20.6	1.77	2.40	0.050	8062539
Dissolved Sulphur (S)	mg/L	137	8068329	192	98.6	<3.0	3.0	8062539
RDL = Reportable Detection Limit								

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		NH5804	NH5805	NH5806	NH5807		
Sampling Date		2015/10/01 12:05	2015/09/30 13:05	2015/09/30 14:12			
COC Number		08412389	08412389	08412389	08412389		
	UNITS	BC-66	BC-67	BC-69	BC-C	RDL	QC Batch
Misc. Inorganics							
Dissolved Hardness (CaCO3)	mg/L	350	179	436	675	0.50	8062373
Elements							
Dissolved Mercury (Hg)	mg/L	<0.0000020	<0.0000020	<0.0000020	<0.0000020	0.0000020	8065644
Dissolved Metals by ICPMS							
Dissolved Aluminum (Al)	mg/L	0.00078	0.00164	0.00169	<0.00050	0.00050	8064011
Dissolved Antimony (Sb)	mg/L	0.000124	0.0668	0.00569	0.000223	0.000020	8064011
Dissolved Arsenic (As)	mg/L	0.000181	0.00286	0.0394	0.0261	0.000020	8064011
Dissolved Barium (Ba)	mg/L	0.0506	0.183	0.0267	0.0213	0.000020	8064011
Dissolved Beryllium (Be)	mg/L	<0.000010	<0.000010	<0.000010	0.000011	0.000010	8064011
Dissolved Bismuth (Bi)	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000050	8064011
Dissolved Boron (B)	mg/L	<0.010	<0.010	<0.010	0.032	0.010	8064011
Dissolved Cadmium (Cd)	mg/L	0.0000120	0.0000940	0.000913	0.0000350	0.0000050	8064011
Dissolved Chromium (Cr)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	8064011
Dissolved Cobalt (Co)	mg/L	0.0727	0.000883	0.000507	0.00488	0.0000050	8064011
Dissolved Copper (Cu)	mg/L	0.000230	0.000252	0.000445	0.000176	0.000050	8064011
Dissolved Iron (Fe)	mg/L	<0.0010	<0.0010	0.0014	0.187	0.0010	8064011
Dissolved Lead (Pb)	mg/L	0.0000110	0.0000090	0.0000140	0.0000090	0.0000050	8064011
Dissolved Lithium (Li)	mg/L	0.0180	0.00511	0.00824	0.0389	0.00050	8064011
Dissolved Manganese (Mn)	mg/L	0.000365	0.0866	0.336	2.13	0.000050	8064011
Dissolved Molybdenum (Mo)	mg/L	0.000178	0.000321	0.000312	0.000288	0.000050	8064011
Dissolved Nickel (Ni)	mg/L	0.000393	0.0152	0.00321	0.00705	0.000020	8064011
Dissolved Phosphorus (P)	mg/L	0.0061	0.0257	0.0079	0.0037	0.0020	8064011
Dissolved Selenium (Se)	mg/L	0.0147	0.000078	0.000797	0.000299	0.000040	8064011
Dissolved Silicon (Si)	mg/L	4.62	4.70	2.96	5.91	0.050	8064011
Dissolved Silver (Ag)	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000050	8064011
Dissolved Strontium (Sr)	mg/L	0.356	0.219	0.478	0.559	0.000050	8064011
Dissolved Thallium (Tl)	mg/L	0.0000110	0.0000450	0.000278	0.0000430	0.0000020	8064011
Dissolved Tin (Sn)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	8064011
Dissolved Titanium (Ti)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8064011
Dissolved Uranium (U)	mg/L	0.000963	0.00329	0.00370	0.00311	0.0000020	8064011
Dissolved Vanadium (V)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	8064011
Dissolved Zinc (Zn)	mg/L	0.00175	0.0683	0.115	0.146	0.00010	8064011
Dissolved Zirconium (Zr)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	8064011
Dissolved Calcium (Ca)	mg/L	70.4	45.7	82.3	145	0.050	8062539
Dissolved Magnesium (Mg)	mg/L	42.3	15.7	55.9	76.0	0.050	8062539
Dissolved Potassium (K)	mg/L	2.47	1.43	5.81	3.72	0.050	8062539

RDL = Reportable Detection Limit

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		NH5804	NH5805	NH5806	NH5807		
Sampling Date		2015/10/01 12:05	2015/09/30 13:05	2015/09/30 14:12			
COC Number		08412389	08412389	08412389	08412389		
	UNITS	**BC-66**	**BC-67**	**BC-69**	**BC-C**	**RDL**	**QC Batch**
Dissolved Sodium (Na)	mg/L	10.8	2.29	1.87	8.71	0.050	8062539
Dissolved Sulphur (S)	mg/L	7.7	12.1	37.7	140	3.0	8062539
RDL = Reportable Detection Limit							

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		NH5814	NH5815	NH5816	NH5817	NH5829		
Sampling Date		2015/09/30 12:01	2015/09/30 14:41	2015/09/30 15:15	2015/09/30 11:45	2015/09/29 13:32		
COC Number		08412390	08412390	08412390	08412390	08412391		
	UNITS	BC-10	BC-12	BC-15	BC-17	BC-3	RDL	QC Batch
Misc. Inorganics								
Dissolved Hardness (CaCO3)	mg/L	249	507	571	199	214	0.50	8062373
Elements								
Dissolved Mercury (Hg)	mg/L	<0.0000020	<0.0000020	0.0000049	0.0000028	<0.0000020	0.0000020	8065739
Dissolved Metals by ICPMS								
Dissolved Aluminum (Al)	mg/L	0.00105	0.0144	0.00560	0.00319	0.0530	0.00050	8064011
Dissolved Antimony (Sb)	mg/L	0.105	0.164	0.00403	0.172	0.00415	0.000020	8064011
Dissolved Arsenic (As)	mg/L	0.0156	0.0783	0.0525	0.0439	0.00215	0.000020	8064011
Dissolved Barium (Ba)	mg/L	0.130	0.0379	0.0485	0.103	0.0557	0.000020	8064011
Dissolved Beryllium (Be)	mg/L	<0.000010	0.000250	<0.000010	<0.000010	0.000036	0.000010	8064011
Dissolved Bismuth (Bi)	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000050	8064011
Dissolved Boron (B)	mg/L	<0.010	0.016	<0.010	<0.010	<0.010	0.010	8064011
Dissolved Cadmium (Cd)	mg/L	0.0000260	0.00113	0.0000160	0.0000260	0.0000400	0.0000050	8064011
Dissolved Chromium (Cr)	mg/L	<0.00010	<0.00010	<0.00010	0.00021	0.00018	0.00010	8064011
Dissolved Cobalt (Co)	mg/L	0.0000180	0.0117	0.0000220	<0.0000050	0.000553	0.0000050	8064011
Dissolved Copper (Cu)	mg/L	0.000273	0.00234	0.000194	0.000158	0.00139	0.000050	8064011
Dissolved Iron (Fe)	mg/L	0.0011	0.0039	0.0011	<0.0010	0.0939	0.0010	8064011
Dissolved Lead (Pb)	mg/L	<0.0000050	<0.0000050	0.0000100	0.0000080	0.0000320	0.0000050	8064011
Dissolved Lithium (Li)	mg/L	0.00321	0.00632	0.00115	0.00251	0.0100	0.00050	8064011
Dissolved Manganese (Mn)	mg/L	0.00372	0.546	0.00191	0.000244	0.0422	0.000050	8064011
Dissolved Molybdenum (Mo)	mg/L	0.00397	0.0159	0.000974	0.00826	0.00210	0.000050	8064011
Dissolved Nickel (Ni)	mg/L	0.000492	0.0368	0.000697	0.00169	0.00360	0.000020	8064011
Dissolved Phosphorus (P)	mg/L	0.0038	0.0028	0.0038	0.0066	0.0079	0.0020	8064011
Dissolved Selenium (Se)	mg/L	0.00512	0.000981	0.0183	0.00983	0.00203	0.000040	8064011
Dissolved Silicon (Si)	mg/L	1.50	5.41	2.05	4.08	4.60	0.050	8064011
Dissolved Silver (Ag)	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000050	8064011
Dissolved Strontium (Sr)	mg/L	0.488	0.783	1.11	0.297	0.259	0.000050	8064011
Dissolved Thallium (Tl)	mg/L	0.0000550	0.0000450	0.0000360	0.0000550	0.0000100	0.0000020	8064011
Dissolved Tin (Sn)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	8064011
Dissolved Titanium (Ti)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8064011
Dissolved Uranium (U)	mg/L	0.00978	0.00666	0.00421	0.00677	0.00158	0.0000020	8064011
Dissolved Vanadium (V)	mg/L	<0.00020	<0.00020	<0.00020	0.00029	0.00063	0.00020	8064011
Dissolved Zinc (Zn)	mg/L	0.00035	0.0655	0.00065	0.0124	0.00430	0.00010	8064011
Dissolved Zirconium (Zr)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	0.00020	0.00010	8064011
Dissolved Calcium (Ca)	mg/L	58.9	125	128	53.2	53.2	0.050	8062539
Dissolved Magnesium (Mg)	mg/L	24.8	47.2	60.9	16.1	19.7	0.050	8062539
Dissolved Potassium (K)	mg/L	1.66	1.97	1.01	0.880	1.23	0.050	8062539

RDL = Reportable Detection Limit

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		NH5814	NH5815	NH5816	NH5817	NH5829		
Sampling Date		2015/09/30 12:01	2015/09/30 14:41	2015/09/30 15:15	2015/09/30 11:45	2015/09/29 13:32		
COC Number		08412390	08412390	08412390	08412390	08412391		
	UNITS	**BC-10**	**BC-12**	**BC-15**	**BC-17**	**BC-3**	**RDL**	**QC Batch**
Dissolved Sodium (Na)	mg/L	0.789	1.04	0.430	1.26	2.81	0.050	8062539
Dissolved Sulphur (S)	mg/L	36.3	108	139	24.6	32.2	3.0	8062539
RDL = Reportable Detection Limit								

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		NH5830	NH5831	NH5832	NH5833	NH5834		
Sampling Date		2015/09/29 12:52	2015/09/29 14:52	2015/10/01 16:26	2015/10/01 15:47	2015/10/01 16:05		
COC Number		08412391	08412391	08412392	08412392	08412392		
	UNITS	BC-4	BC-5	BC-28	BC-28A	BC-28B	RDL	QC Batch
Misc. Inorganics								
Dissolved Hardness (CaCO3)	mg/L	298	226	47.8	1300	898	0.50	8062373
Elements								
Dissolved Mercury (Hg)	mg/L	<0.0000020	0.0000036	0.0000083	0.0000290	0.0000126	0.0000020	8065739
Dissolved Metals by ICPMS								
Dissolved Aluminum (Al)	mg/L	0.0185	0.0226	0.00380	0.0284	0.0281	0.00050	8064011
Dissolved Antimony (Sb)	mg/L	0.00369	0.000533	0.00980	1.79	1.39	0.000020	8064011
Dissolved Arsenic (As)	mg/L	0.00224	0.000505	0.00126	0.325	0.167	0.000020	8064011
Dissolved Barium (Ba)	mg/L	0.0691	0.0573	0.122	0.0319	0.0383	0.000020	8064011
Dissolved Beryllium (Be)	mg/L	<0.000010	<0.000010	<0.000010	0.000013	<0.000010	0.000010	8064011
Dissolved Bismuth (Bi)	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000050	8064011
Dissolved Boron (B)	mg/L	<0.010	<0.010	0.012	0.012	<0.010	0.010	8064011
Dissolved Cadmium (Cd)	mg/L	0.0000830	0.0000460	<0.0000050	0.000219	0.0000510	0.0000050	8064011
Dissolved Chromium (Cr)	mg/L	0.00012	0.00018	<0.00010	0.00041	0.00019	0.00010	8064011
Dissolved Cobalt (Co)	mg/L	0.000524	0.0000640	0.00136	0.439	0.389	0.0000050	8064011
Dissolved Copper (Cu)	mg/L	0.00210	0.00183	0.000781	0.00162	0.00210	0.000050	8064011
Dissolved Iron (Fe)	mg/L	0.0740	0.0873	0.0170	0.171	0.0279	0.0010	8064011
Dissolved Lead (Pb)	mg/L	0.0000290	0.0000140	0.0000230	0.0000220	0.0000160	0.0000050	8064011
Dissolved Lithium (Li)	mg/L	0.00856	0.00378	0.00247	0.00510	0.00337	0.00050	8064011
Dissolved Manganese (Mn)	mg/L	0.0687	0.0115	0.000414	0.0310	0.0204	0.000050	8064011
Dissolved Molybdenum (Mo)	mg/L	0.00215	0.00250	0.000138	0.0193	0.0177	0.000050	8064011
Dissolved Nickel (Ni)	mg/L	0.00330	0.00373	0.000706	0.00747	0.00477 (1)	0.000020	8064011
Dissolved Phosphorus (P)	mg/L	0.0064	0.0060	0.0063	0.0431	0.0078	0.0020	8064011
Dissolved Selenium (Se)	mg/L	0.00414	0.00204	0.000245	0.155	0.108	0.000040	8064011
Dissolved Silicon (Si)	mg/L	3.59	4.09	4.77	4.66	0.569	0.050	8064011
Dissolved Silver (Ag)	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000050	8064011
Dissolved Strontium (Sr)	mg/L	0.445	0.209	0.0699	1.82	1.30	0.000050	8064011
Dissolved Thallium (Tl)	mg/L	0.0000090	0.0000030	0.0000040	0.000320	0.000189	0.0000020	8064011
Dissolved Tin (Sn)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	8064011
Dissolved Titanium (Ti)	mg/L	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00050	8064011
Dissolved Uranium (U)	mg/L	0.00308	0.00143	0.0000250	0.0348	0.0187	0.0000020	8064011
Dissolved Vanadium (V)	mg/L	0.00096	0.00096	0.00024	<0.00020	<0.00020	0.00020	8064011
Dissolved Zinc (Zn)	mg/L	0.00586	0.0121	0.0313	0.00672	0.00110	0.00010	8064011
Dissolved Zirconium (Zr)	mg/L	0.00010	0.00020	<0.00010	<0.00010	<0.00010	0.00010	8064011
Dissolved Calcium (Ca)	mg/L	69.1	55.2	11.9	366	253	0.050	8062539
Dissolved Magnesium (Mg)	mg/L	30.4	21.5	4.42	94.6	64.4	0.050	8062539

RDL = Reportable Detection Limit

(1) Matrix Spike outside acceptance criteria (10% of analytes failure allowed).

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Maxxam Job #: B587453
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Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

Maxxam ID		NH5830	NH5831	NH5832	NH5833	NH5834		
Sampling Date		2015/09/29 12:52	2015/09/29 14:52	2015/10/01 16:26	2015/10/01 15:47	2015/10/01 16:05		
COC Number		08412391	08412391	08412392	08412392	08412392		
	UNITS	BC-4	BC-5	BC-28	BC-28A	BC-28B	RDL	QC Batch
Dissolved Potassium (K)	mg/L	1.28	0.615	0.814	5.23	4.69	0.050	8062539
Dissolved Sodium (Na)	mg/L	2.17	1.77	4.68	374	309	0.050	8062539
Dissolved Sulphur (S)	mg/L	55.8	34.5	5.6	364	229	3.0	8062539
RDL = Reportable Detection Limit								

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

LOW LEVEL TOTAL METALS WITH CV HG (WATER)

Maxxam ID		NH5784	NH5787	NH5788	NH5790	NH5792		
Sampling Date		2015/09/29 09:15	2015/09/29 09:36	2015/09/30 16:45		2015/10/05 11:00		
COC Number		08412388	08412388	08412388	08412388	08412388		
	UNITS	BC-6	BC-39	BC-51W	BC-B	TRIP BLANK	RDL	QC Batch
Calculated Parameters								
Total Hardness (CaCO3)	mg/L	150	138	304	<0.50	<0.50	0.50	8062535
Elements								
Total Mercury (Hg)	mg/L	<0.0000020	<0.0000020	0.0000101	<0.0000020	<0.0000020	0.0000020	8065423
Total Metals by ICPMS								
Total Aluminum (Al)	mg/L	0.0123	0.00296	5.10	0.00179	<0.00050	0.00050	8063964
Total Antimony (Sb)	mg/L	0.000172	0.000259	0.00305	<0.000020	<0.000020	0.000020	8063964
Total Arsenic (As)	mg/L	0.000547	0.000335	0.0174	0.000029	<0.000020	0.000020	8063964
Total Barium (Ba)	mg/L	0.0528	0.0751	0.0384	<0.000020	<0.000020	0.000020	8063964
Total Beryllium (Be)	mg/L	<0.000010	<0.000010	0.0128	<0.000010	<0.000010	0.000010	8063964
Total Bismuth (Bi)	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000050	8063964
Total Boron (B)	mg/L	<0.010	<0.010	0.012	<0.010	<0.010	0.010	8063964
Total Cadmium (Cd)	mg/L	0.0000360	0.0000310	0.00393	<0.0000050	<0.0000050	0.0000050	8063964
Total Chromium (Cr)	mg/L	<0.00010	<0.00010	0.00134	<0.00010	<0.00010	0.00010	8063964
Total Cobalt (Co)	mg/L	0.0000340	0.0000250	0.0511	<0.0000050	<0.0000050	0.0000050	8063964
Total Copper (Cu)	mg/L	0.000725	0.000570	0.248	0.000062	<0.000050	0.000050	8063964
Total Iron (Fe)	mg/L	0.0381	0.0053	5.89	<0.0010	<0.0010	0.0010	8063964
Total Lead (Pb)	mg/L	0.0000290	0.0000140	0.000166	0.000115	<0.0000050	0.0000050	8063964
Total Lithium (Li)	mg/L	0.00245	0.00184	0.0125	<0.00050	<0.00050	0.00050	8063964
Total Manganese (Mn)	mg/L	0.00763	0.000873	2.23	<0.000050	<0.000050	0.000050	8063964
Total Molybdenum (Mo)	mg/L	0.000592	0.000678	0.000051	<0.000050	<0.000050	0.000050	8063964
Total Nickel (Ni)	mg/L	0.000890	0.000438	0.151	<0.000020	<0.000020	0.000020	8063964
Total Phosphorus (P)	mg/L	0.0028	0.0036	0.0080	0.0022	0.0021	0.0020	8063964
Total Selenium (Se)	mg/L	0.000820	0.000568	0.00409	<0.000040	<0.000040	0.000040	8063964
Total Silicon (Si)	mg/L	2.91	2.88	10.2	<0.050	<0.050	0.050	8063964
Total Silver (Ag)	mg/L	<0.0000050	<0.0000050	0.0000260	<0.0000050	<0.0000050	0.0000050	8063964
Total Strontium (Sr)	mg/L	0.222	0.205	0.428	<0.000050	<0.000050	0.000050	8063964
Total Thallium (Tl)	mg/L	<0.0000020	<0.0000020	0.000126	<0.0000020	<0.0000020	0.0000020	8063964
Total Tin (Sn)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	8063964
Total Titanium (Ti)	mg/L	<0.00050	<0.00050	0.00063	<0.00050	<0.00050	0.00050	8063964
Total Uranium (U)	mg/L	0.000858	0.000765	0.00445	<0.0000020	<0.0000020	0.0000020	8063964
Total Vanadium (V)	mg/L	0.00030	0.00030	0.00038	<0.00020	<0.00020	0.00020	8063964
Total Zinc (Zn)	mg/L	0.00274	0.00170	0.401	0.00059	<0.00010	0.00010	8063964
Total Zirconium (Zr)	mg/L	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00010	8063964
Total Calcium (Ca)	mg/L	39.9	37.6	63.9	<0.050	<0.050	0.050	8062944
Total Magnesium (Mg)	mg/L	12.3	10.6	35.0	<0.050	<0.050	0.050	8062944
Total Potassium (K)	mg/L	0.508	0.623	2.18	<0.050	<0.050	0.050	8062944

RDL = Reportable Detection Limit

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

LOW LEVEL TOTAL METALS WITH CV HG (WATER)

Maxxam ID		NH5784	NH5787	NH5788	NH5790	NH5792		
Sampling Date		2015/09/29 09:15	2015/09/29 09:36	2015/09/30 16:45		2015/10/05 11:00		
COC Number		08412388	08412388	08412388	08412388	08412388		
	UNITS	BC-6	BC-39	BC-51W	BC-B	TRIP BLANK	RDL	QC Batch
Total Sodium (Na)	mg/L	2.05	2.25	0.828	<0.050	<0.050	0.050	8062944
Total Sulphur (S)	mg/L	21.3	18.5	108	<3.0	<3.0	3.0	8062944
RDL = Reportable Detection Limit								

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

LOW LEVEL TOTAL METALS WITH CV HG (WATER)

Maxxam ID		NH5814	NH5815	NH5816	NH5817	NH5832		
Sampling Date		2015/09/30 12:01	2015/09/30 14:41	2015/09/30 15:15	2015/09/30 11:45	2015/10/01 16:26		
COC Number		08412390	08412390	08412390	08412390	08412392		
	UNITS	BC-10	BC-12	BC-15	BC-17	BC-28	RDL	QC Batch
Calculated Parameters								
Total Hardness (CaCO3)	mg/L	257	556	577	211	49.7	0.50	8062535
Elements								
Total Mercury (Hg)	mg/L	0.0000037	0.0000029	<0.0000020	<0.0000020	0.0000040	0.0000020	8065423
Total Metals by ICPMS								
Total Aluminum (Al)	mg/L	0.0757	0.364	0.101	0.00501	1.79	0.00050	8063964
Total Antimony (Sb)	mg/L	0.110	0.181	0.00427	0.175	0.0104	0.000020	8063964
Total Arsenic (As)	mg/L	0.0177	0.336	0.0571	0.0461	0.00280	0.000020	8063964
Total Barium (Ba)	mg/L	0.139	0.0374	0.0563	0.106	0.171	0.000020	8063964
Total Beryllium (Be)	mg/L	<0.000010	0.00102	<0.000010	<0.000010	0.000043	0.000010	8063964
Total Bismuth (Bi)	mg/L	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000050	8063964
Total Boron (B)	mg/L	<0.010	0.018	<0.010	<0.010	0.015	0.010	8063964
Total Cadmium (Cd)	mg/L	0.0000410	0.00137	0.0000260	0.0000340	0.0000110	0.0000050	8063964
Total Chromium (Cr)	mg/L	0.00011	<0.00010	0.00019	0.00019	0.00193	0.00010	8063964
Total Cobalt (Co)	mg/L	0.0000430	0.0151	0.0000420	0.0000070	0.00155	0.0000050	8063964
Total Copper (Cu)	mg/L	0.000402	0.00841	0.000354	0.000181	0.00188	0.000050	8063964
Total Iron (Fe)	mg/L	0.0508	1.16	0.0496	0.0055	0.715	0.0010	8063964
Total Lead (Pb)	mg/L	0.000128	0.0000270	0.000167	0.0000260	0.000627	0.0000050	8063964
Total Lithium (Li)	mg/L	0.00371	0.00749	0.00142	0.00300	0.00318	0.00050	8063964
Total Manganese (Mn)	mg/L	0.0264	0.662	0.00620	0.00128	0.00485	0.000050	8063964
Total Molybdenum (Mo)	mg/L	0.00404	0.0142	0.00106	0.00860	0.000186	0.000050	8063964
Total Nickel (Ni)	mg/L	0.000593	0.0458	0.000772	0.00181	0.00152	0.000020	8063964
Total Phosphorus (P)	mg/L	0.0062	0.0093	0.0047	0.0072	0.0250	0.0020	8063964
Total Selenium (Se)	mg/L	0.00548	0.00126	0.0193	0.0103	0.000350	0.000040	8063964
Total Silicon (Si)	mg/L	1.56	5.80	2.16	4.13	7.63	0.050	8063964
Total Silver (Ag)	mg/L	<0.0000050	<0.0000050	0.0000100	<0.0000050	0.0000220	0.0000050	8063964
Total Strontium (Sr)	mg/L	0.480	0.843	1.16	0.304	0.0718	0.000050	8063964
Total Thallium (Tl)	mg/L	0.0000630	0.0000470	0.0000470	0.0000600	0.0000390	0.0000020	8063964
Total Tin (Sn)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	8063964
Total Titanium (Ti)	mg/L	0.00093	0.00109	0.00219	<0.00050	0.0317	0.00050	8063964
Total Uranium (U)	mg/L	0.0102	0.00720	0.00447	0.00688	0.0000980	0.0000020	8063964
Total Vanadium (V)	mg/L	0.00049	0.00039	0.00057	0.00034	0.00396	0.00020	8063964
Total Zinc (Zn)	mg/L	0.00120	0.0896	0.00108	0.0142	0.0469	0.00010	8063964
Total Zirconium (Zr)	mg/L	0.00010	<0.00010	<0.00010	<0.00010	0.00234	0.00010	8063964
Total Calcium (Ca)	mg/L	60.5	140	126	55.0	12.2	0.050	8062944
Total Magnesium (Mg)	mg/L	25.8	50.4	63.8	17.9	4.67	0.050	8062944
Total Potassium (K)	mg/L	1.70	1.97	1.10	0.932	1.42	0.050	8062944

RDL = Reportable Detection Limit

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

LOW LEVEL TOTAL METALS WITH CV HG (WATER)

Maxxam ID		NH5814	NH5815	NH5816	NH5817	NH5832		
Sampling Date		2015/09/30 12:01	2015/09/30 14:41	2015/09/30 15:15	2015/09/30 11:45	2015/10/01 16:26		
COC Number		08412390	08412390	08412390	08412390	08412392		
	UNITS	**BC-10**	**BC-12**	**BC-15**	**BC-17**	**BC-28**	**RDL**	**QC Batch**
Total Sodium (Na)	mg/L	0.840	1.09	0.471	1.36	4.98	0.050	8062944
Total Sulphur (S)	mg/L	36.6	127	138	25.3	5.4	3.0	8062944
RDL = Reportable Detection Limit								

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LOW LEVEL TOTAL METALS WITH CV HG (WATER)

Maxxam ID		NH5833		NH5834		
Sampling Date		2015/10/01 15:47		2015/10/01 16:05		
COC Number		08412392		08412392		
	UNITS	BC-28A	QC Batch	BC-28B	RDL	QC Batch
Calculated Parameters						
Total Hardness (CaCO3)	mg/L	1310	8062535	892	0.50	8063616
Elements						
Total Mercury (Hg)	mg/L	0.0000338	8065423	0.0000133	0.0000020	8065423
Total Metals by ICPMS						
Total Aluminum (Al)	mg/L	0.0696	8063964	0.0394	0.00050	8063964
Total Antimony (Sb)	mg/L	1.88	8063964	1.38	0.000020	8063964
Total Arsenic (As)	mg/L	0.338	8063964	0.175	0.000020	8063964
Total Barium (Ba)	mg/L	0.0325	8063964	0.0389	0.000020	8063964
Total Beryllium (Be)	mg/L	0.000033	8063964	<0.000010	0.000010	8063964
Total Bismuth (Bi)	mg/L	<0.0000050	8063964	<0.0000050	0.0000050	8063964
Total Boron (B)	mg/L	0.014	8063964	<0.010	0.010	8063964
Total Cadmium (Cd)	mg/L	0.000229	8063964	0.0000550	0.0000050	8063964
Total Chromium (Cr)	mg/L	0.00042	8063964	0.00023	0.00010	8063964
Total Cobalt (Co)	mg/L	0.481	8063964	0.392	0.0000050	8063964
Total Copper (Cu)	mg/L	0.00178	8063964	0.00222	0.000050	8063964
Total Iron (Fe)	mg/L	0.191	8063964	0.0571	0.0010	8063964
Total Lead (Pb)	mg/L	0.0000210	8063964	0.0000490	0.0000050	8063964
Total Lithium (Li)	mg/L	0.00584	8063964	0.00405	0.00050	8063964
Total Manganese (Mn)	mg/L	0.0316	8063964	0.0223	0.000050	8063964
Total Molybdenum (Mo)	mg/L	0.0193	8063964	0.0182	0.000050	8063964
Total Nickel (Ni)	mg/L	0.00762	8063964	0.00479	0.000020	8063964
Total Phosphorus (P)	mg/L	0.0461	8063964	0.0104	0.0020	8063964
Total Selenium (Se)	mg/L	0.164	8063964	0.110	0.000040	8063964
Total Silicon (Si)	mg/L	4.69	8063964	0.591	0.050	8063964
Total Silver (Ag)	mg/L	0.0000050	8063964	0.0000070	0.0000050	8063964
Total Strontium (Sr)	mg/L	1.82	8063964	1.25	0.000050	8063964
Total Thallium (Tl)	mg/L	0.000319	8063964	0.000199	0.0000020	8063964
Total Tin (Sn)	mg/L	<0.00020	8063964	<0.00020	0.00020	8063964
Total Titanium (Ti)	mg/L	<0.00050	8063964	<0.00050	0.00050	8063964
Total Uranium (U)	mg/L	0.0344	8063964	0.0183	0.0000020	8063964
Total Vanadium (V)	mg/L	<0.00020	8063964	0.00024	0.00020	8063964
Total Zinc (Zn)	mg/L	0.00712	8063964	0.00143	0.00010	8063964
Total Zirconium (Zr)	mg/L	<0.00010	8063964	<0.00010	0.00010	8063964
Total Calcium (Ca)	mg/L	366	8062944	250	0.050	8063617
Total Magnesium (Mg)	mg/L	96.2	8062944	65.1	0.050	8063617
Total Potassium (K)	mg/L	5.07	8062944	4.50	0.050	8063617
RDL = Reportable Detection Limit						

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

LOW LEVEL TOTAL METALS WITH CV HG (WATER)

Maxxam ID		NH5833		NH5834		
Sampling Date		2015/10/01 15:47		2015/10/01 16:05		
COC Number		08412392		08412392		
	UNITS	**BC-28A**	**QC Batch**	**BC-28B**	**RDL**	**QC Batch**
Total Sodium (Na)	mg/L	378	8062944	312	0.050	8063617
Total Sulphur (S)	mg/L	383	8062944	231	3.0	8063617
RDL = Reportable Detection Limit						

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

LL TOTAL METALS (DIGESTED) WITH CV HG

Maxxam ID		NH5782	NH5783	NH5785	NH5786	NH5789		
Sampling Date		2015/09/29 11:00	2015/09/29 14:10	2015/09/29 11:55	2015/09/29 15:35	2015/09/29 10:15		
COC Number		08412388	08412388	08412388	08412388	08412388		
	UNITS	BC-1	BC-2	BC-31	BC-34	BC-53	RDL	QC Batch
Calculated Parameters								
Total Hardness (CaCO3)	mg/L	198	171	237	226	197	0.50	8062535
Elements								
Total Mercury (Hg)	mg/L	<0.0000020	0.0000027	0.0000029	0.0000026	<0.0000020	0.0000020	8065423
Total Metals by ICPMS								
Total Aluminum (Al)	mg/L	0.588	0.759	0.0516	0.0388	0.215	0.0030	8064153
Total Antimony (Sb)	mg/L	0.00329	0.000862	0.000615	0.000268	0.00300	0.000050	8064153
Total Arsenic (As)	mg/L	0.00429	0.00106	0.000588	0.000266	0.00340	0.000020	8064153
Total Barium (Ba)	mg/L	0.0852	0.0964	0.0590	0.0454	0.0663	0.00010	8064153
Total Beryllium (Be)	mg/L	0.000057	0.000046	0.000015	<0.000010	0.000037	0.000010	8064153
Total Bismuth (Bi)	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	<0.000020	0.000020	8064153
Total Boron (B)	mg/L	<0.050	<0.050	<0.050	<0.050	<0.050	0.050	8064153
Total Cadmium (Cd)	mg/L	0.0000740	0.0000370	0.0000470	0.0000920	0.0000440	0.0000050	8064153
Total Chromium (Cr)	mg/L	0.00119	0.00126	<0.00050	<0.00050	0.00068	0.00050	8064153
Total Cobalt (Co)	mg/L	0.00153	0.00795	0.000100	0.000059	0.00113	0.000010	8064153
Total Copper (Cu)	mg/L	0.00288	0.00282	0.00209	0.00174	0.00227	0.00020	8064153
Total Iron (Fe)	mg/L	1.02	1.23	0.130	0.0807	0.435	0.0050	8064153
Total Lead (Pb)	mg/L	0.000602	0.000794	0.000070	<0.000050	0.000233	0.000050	8064153
Total Lithium (Li)	mg/L	0.00978	0.00814	0.00479	0.00221	0.00852	0.00050	8064153
Total Manganese (Mn)	mg/L	0.0664	0.0790	0.0142	0.00843	0.0452	0.00010	8064153
Total Molybdenum (Mo)	mg/L	0.00240	0.000288	0.00142	0.00148	0.00229	0.000050	8064153
Total Nickel (Ni)	mg/L	0.00392	0.00261	0.00217	0.00247	0.00291	0.00010	8064153
Total Phosphorus (P)	mg/L	0.047	0.056	0.010	0.013	0.022	0.010	8064153
Total Selenium (Se)	mg/L	0.00174	0.00261	0.00170	0.00211	0.00176	0.000040	8064153
Total Silicon (Si)	mg/L	5.82	6.74	3.70	3.39	5.35	0.10	8064153
Total Silver (Ag)	mg/L	0.0000130	0.0000150	0.0000060	<0.0000050	0.0000070	0.0000050	8064153
Total Strontium (Sr)	mg/L	0.226	0.129	0.280	0.230	0.230	0.000050	8064153
Total Thallium (Tl)	mg/L	0.0000100	0.0000120	0.0000050	0.0000040	0.0000050	0.0000020	8064153
Total Tin (Sn)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	8064153
Total Titanium (Ti)	mg/L	0.0214	0.0232	<0.0050	<0.0050	0.0071	0.0050	8064153
Total Uranium (U)	mg/L	0.00171	0.000581	0.00211	0.00134	0.00166	0.0000050	8064153
Total Vanadium (V)	mg/L	0.00315	0.00318	0.00115	0.00120	0.00187	0.00050	8064153
Total Zinc (Zn)	mg/L	0.0069	0.0043	0.0049	0.0088	0.0046	0.0010	8064153
Total Zirconium (Zr)	mg/L	0.00040	0.00065	0.00018	0.00011	0.00035	0.00010	8064153
Total Calcium (Ca)	mg/L	48.6	40.5	56.5	56.7	49.0	0.25	8062944
Total Magnesium (Mg)	mg/L	18.6	17.0	23.3	20.6	18.2	0.25	8062944
Total Potassium (K)	mg/L	1.14	0.97	0.80	0.66	1.09	0.25	8062944

RDL = Reportable Detection Limit

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

LL TOTAL METALS (DIGESTED) WITH CV HG

Maxxam ID		NH5782	NH5783	NH5785	NH5786	NH5789		
Sampling Date		2015/09/29 11:00	2015/09/29 14:10	2015/09/29 11:55	2015/09/29 15:35	2015/09/29 10:15		
COC Number		08412388	08412388	08412388	08412388	08412388		
	UNITS	BC-1	BC-2	BC-31	BC-34	BC-53	RDL	QC Batch
Total Sodium (Na)	mg/L	3.67	9.43	1.72	1.31	3.58	0.25	8062944
Total Sulphur (S)	mg/L	31	38	34	35	31	15	8062944
RDL = Reportable Detection Limit								

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

LL TOTAL METALS (DIGESTED) WITH CV HG

Maxxam ID		NH5791	NH5829	NH5830	NH5831		
Sampling Date			2015/09/29 13:32	2015/09/29 12:52	2015/09/29 14:52		
COC Number		08412388	08412391	08412391	08412391		
	UNITS	BC-A	BC-3	BC-4	BC-5	RDL	QC Batch
Calculated Parameters							
Total Hardness (CaCO3)	mg/L	243	217	303	231	0.50	8062535
Elements							
Total Mercury (Hg)	mg/L	0.0000025	<0.0000020	<0.0000020	0.0000056	0.0000020	8065423
Total Metals by ICPMS							
Total Aluminum (Al)	mg/L	0.0461	0.139	0.305	0.0614	0.0030	8064153
Total Antimony (Sb)	mg/L	0.000598	0.00413	0.00330	0.000537	0.000050	8064153
Total Arsenic (As)	mg/L	0.000621	0.00262	0.00339	0.000580	0.000020	8064153
Total Barium (Ba)	mg/L	0.0593	0.0600	0.0736	0.0592	0.00010	8064153
Total Beryllium (Be)	mg/L	0.000014	0.000045	0.000021	0.000014	0.000010	8064153
Total Bismuth (Bi)	mg/L	<0.000020	<0.000020	<0.000020	<0.000020	0.000020	8064153
Total Boron (B)	mg/L	<0.050	<0.050	<0.050	<0.050	0.050	8064153
Total Cadmium (Cd)	mg/L	0.0000520	0.0000640	0.000192	0.0000620	0.0000050	8064153
Total Chromium (Cr)	mg/L	<0.00050	<0.00050	0.00065	0.00216	0.00050	8064153
Total Cobalt (Co)	mg/L	0.000089	0.000680	0.000817	0.000092	0.000010	8064153
Total Copper (Cu)	mg/L	0.00202	0.00199	0.00179	0.00231	0.00020	8064153
Total Iron (Fe)	mg/L	0.117	0.293	0.917	0.154	0.0050	8064153
Total Lead (Pb)	mg/L	0.000068	0.000140	0.000430	<0.000050	0.000050	8064153
Total Lithium (Li)	mg/L	0.00471	0.0105	0.00836	0.00339	0.00050	8064153
Total Manganese (Mn)	mg/L	0.0144	0.0508	0.0843	0.0156	0.00010	8064153
Total Molybdenum (Mo)	mg/L	0.00143	0.00217	0.00199	0.00256	0.000050	8064153
Total Nickel (Ni)	mg/L	0.00215	0.00404	0.00446	0.00484	0.00010	8064153
Total Phosphorus (P)	mg/L	0.010	0.019	0.031	0.013	0.010	8064153
Total Selenium (Se)	mg/L	0.00172	0.00180	0.00378	0.00184	0.000040	8064153
Total Silicon (Si)	mg/L	3.70	4.78	4.99	4.11	0.10	8064153
Total Silver (Ag)	mg/L	<0.0000050	<0.0000050	<0.0000050	0.0000080	0.0000050	8064153
Total Strontium (Sr)	mg/L	0.286	0.259	0.435	0.213	0.000050	8064153
Total Thallium (Tl)	mg/L	0.0000040	0.0000050	0.0000120	0.0000030	0.0000020	8064153
Total Tin (Sn)	mg/L	<0.00020	<0.00020	<0.00020	<0.00020	0.00020	8064153
Total Titanium (Ti)	mg/L	<0.0050	<0.0050	0.0125	<0.0050	0.0050	8064153
Total Uranium (U)	mg/L	0.00218	0.00167	0.00283	0.00144	0.0000050	8064153
Total Vanadium (V)	mg/L	0.00116	0.00125	0.00258	0.00140	0.00050	8064153
Total Zinc (Zn)	mg/L	0.0048	0.0069	0.0112	0.0146	0.0010	8064153
Total Zirconium (Zr)	mg/L	0.00019	0.00024	0.00018	0.00078	0.00010	8064153
Total Calcium (Ca)	mg/L	57.8	53.3	72.5	56.6	0.25	8062944
Total Magnesium (Mg)	mg/L	24.0	20.3	29.6	21.9	0.25	8062944
Total Potassium (K)	mg/L	0.82	1.22	1.27	0.63	0.25	8062944
RDL = Reportable Detection Limit							

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

LL TOTAL METALS (DIGESTED) WITH CV HG

Maxxam ID		NH5791	NH5829	NH5830	NH5831		
Sampling Date			2015/09/29 13:32	2015/09/29 12:52	2015/09/29 14:52		
COC Number		08412388	08412391	08412391	08412391		
	UNITS	**BC-A**	**BC-3**	**BC-4**	**BC-5**	**RDL**	**QC Batch**
Total Sodium (Na)	mg/L	1.74	2.70	2.14	1.80	0.25	8062944
Total Sulphur (S)	mg/L	35	33	57	36	15	8062944
RDL = Reportable Detection Limit							

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

TEST SUMMARY

Maxxam ID: NH5782
Sample ID: BC-1
Matrix: Water

Collected: 2015/09/29
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065730	2015/10/07	2015/10/07	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8064276	N/A	2015/10/06	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8064498	N/A	2015/10/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8064499	N/A	2015/10/06	Tatyana Serzhanova
Conductance - water	AT/ALK	8065734	N/A	2015/10/07	Maria Maclean
Hardness Total (calculated as CaCO3)	CALC	8062535	N/A	2015/10/07	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8062373	N/A	2015/10/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065644	N/A	2015/10/07	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8065423	2015/10/07	2015/10/07	Edwin Lamigo
Ion Balance	CALC	8062537	N/A	2015/10/07	Automated Statchk
Sum of cations, anions	CALC	8062538	N/A	2015/10/07	David Huang
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8062539	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8063995	N/A	2015/10/06	Andrew An
Elements by ICPMS Digested LL (total)	ICP/CRCM	8064153	2015/10/06	2015/10/07	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8062944	N/A	2015/10/07	Automated Statchk
Ammonia-N (Preserved)	KONE/COL	8065944	N/A	2015/10/07	Sherryl Flores
Nitrate+Nitrite (N) (low level)	TRAA/COL	8064551	N/A	2015/10/06	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8064552	N/A	2015/10/06	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8062947	N/A	2015/10/07	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
pH Water	AT/ALK	8065736	N/A	2015/10/07	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8065781	N/A	2015/10/07	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8063632	2015/10/06	2015/10/07	Liilia Iankovska
Total Suspended Solids-Low Level	BAL/BAL	8063665	2015/10/06	2015/10/07	Liilia Iankovska

Maxxam ID: NH5783
Sample ID: BC-2
Matrix: Water

Collected: 2015/09/29
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065742	2015/10/07	2015/10/07	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8064297	N/A	2015/10/06	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8064498	N/A	2015/10/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8064499	N/A	2015/10/06	Tatyana Serzhanova
Conductance - water	AT/ALK	8065745	N/A	2015/10/07	Maria Maclean
Hardness Total (calculated as CaCO3)	CALC	8062535	N/A	2015/10/07	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8062373	N/A	2015/10/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065644	N/A	2015/10/07	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8065423	2015/10/07	2015/10/07	Edwin Lamigo
Ion Balance	CALC	8062537	N/A	2015/10/07	Automated Statchk
Sum of cations, anions	CALC	8062538	N/A	2015/10/07	David Huang
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8062539	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8063995	N/A	2015/10/06	Andrew An
Elements by ICPMS Digested LL (total)	ICP/CRCM	8064153	2015/10/06	2015/10/07	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8062944	N/A	2015/10/07	Automated Statchk
Ammonia-N (Preserved)	KONE/COL	8065944	N/A	2015/10/07	Sherryl Flores

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

TEST SUMMARY

Maxxam ID: NH5783
Sample ID: BC-2
Matrix: Water

Collected: 2015/09/29
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate+Nitrite (N) (low level)	TRAA/COL	8064553	N/A	2015/10/06	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8064554	N/A	2015/10/06	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8062947	N/A	2015/10/07	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
pH Water	AT/ALK	8065747	N/A	2015/10/07	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8064299	N/A	2015/10/06	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8063632	2015/10/06	2015/10/07	Liilia Iankovska
Total Suspended Solids-Low Level	BAL/BAL	8063665	2015/10/06	2015/10/07	Liilia Iankovska

Maxxam ID: NH5783 Dup
Sample ID: BC-2
Matrix: Water

Collected: 2015/09/29
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8063632	2015/10/06	2015/10/07	Liilia Iankovska

Maxxam ID: NH5784
Sample ID: BC-6
Matrix: Water

Collected: 2015/09/29
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065730	2015/10/07	2015/10/07	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8064297	N/A	2015/10/06	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8064498	N/A	2015/10/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8064499	N/A	2015/10/06	Tatyana Serzhanova
Conductance - water	AT/ALK	8065734	N/A	2015/10/07	Maria Maclean
Hardness Total (calculated as CaCO3)	CALC	8062535	N/A	2015/10/07	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8062373	N/A	2015/10/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065644	N/A	2015/10/07	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8065423	2015/10/07	2015/10/07	Edwin Lamigo
Ion Balance	CALC	8062537	N/A	2015/10/07	Automated Statchk
Sum of cations, anions	CALC	8062538	N/A	2015/10/07	David Huang
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8062539	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8063995	N/A	2015/10/06	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8062944	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (total)	ICP/CRCM	8063964	N/A	2015/10/06	Andrew An
Ammonia-N (Preserved)	KONE/COL	8065944	N/A	2015/10/07	Sherryl Flores
Nitrate+Nitrite (N) (low level)	TRAA/COL	8064553	N/A	2015/10/06	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8064554	N/A	2015/10/06	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8062947	N/A	2015/10/07	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
pH Water	AT/ALK	8065736	N/A	2015/10/07	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8064299	N/A	2015/10/06	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8063632	2015/10/06	2015/10/07	Liilia Iankovska
Total Suspended Solids-Low Level	BAL/BAL	8063665	2015/10/06	2015/10/07	Liilia Iankovska

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

TEST SUMMARY

Maxxam ID: NH5784 Dup
Sample ID: BC-6
Matrix: Water

Collected: 2015/09/29
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate+Nitrite (N) (low level)	TRAA/COL	8064553	N/A	2015/10/06	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8064554	N/A	2015/10/06	Isaac Wang

Maxxam ID: NH5785
Sample ID: BC-31
Matrix: Water

Collected: 2015/09/29
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065742	2015/10/07	2015/10/07	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8064276	N/A	2015/10/06	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8064498	N/A	2015/10/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8064499	N/A	2015/10/06	Tatyana Serzhanova
Conductance - water	AT/ALK	8065745	N/A	2015/10/07	Maria Maclean
Hardness Total (calculated as CaCO3)	CALC	8062535	N/A	2015/10/07	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8062373	N/A	2015/10/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065644	N/A	2015/10/07	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8065423	2015/10/07	2015/10/07	Edwin Lamigo
Ion Balance	CALC	8062537	N/A	2015/10/07	Automated Statchk
Sum of cations, anions	CALC	8062538	N/A	2015/10/07	David Huang
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8062539	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8063995	N/A	2015/10/06	Andrew An
Elements by ICPMS Digested LL (total)	ICP/CRCM	8064153	2015/10/06	2015/10/07	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8062944	N/A	2015/10/07	Automated Statchk
Ammonia-N (Preserved)	KONE/COL	8065944	N/A	2015/10/07	Sherryl Flores
Nitrate+Nitrite (N) (low level)	TRAA/COL	8064551	N/A	2015/10/06	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8064552	N/A	2015/10/06	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8062947	N/A	2015/10/07	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
pH Water	AT/ALK	8065747	N/A	2015/10/07	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8064280	N/A	2015/10/06	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8063632	2015/10/06	2015/10/07	Liilia Iankovska
Total Suspended Solids-Low Level	BAL/BAL	8063665	2015/10/06	2015/10/07	Liilia Iankovska

Maxxam ID: NH5785 Dup
Sample ID: BC-31
Matrix: Water

Collected: 2015/09/29
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065742	2015/10/07	2015/10/07	Maria Maclean
Conductance - water	AT/ALK	8065745	N/A	2015/10/07	Maria Maclean
pH Water	AT/ALK	8065747	N/A	2015/10/07	Maria Maclean

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

TEST SUMMARY

Maxxam ID: NH5786
Sample ID: BC-34
Matrix: Water

Collected: 2015/09/29
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065742	2015/10/07	2015/10/07	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8064297	N/A	2015/10/06	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8064498	N/A	2015/10/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8064499	N/A	2015/10/06	Tatyana Serzhanova
Conductance - water	AT/ALK	8065745	N/A	2015/10/07	Maria Maclean
Hardness Total (calculated as CaCO3)	CALC	8062535	N/A	2015/10/07	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8062373	N/A	2015/10/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065644	N/A	2015/10/07	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8065423	2015/10/07	2015/10/07	Edwin Lamigo
Ion Balance	CALC	8062537	N/A	2015/10/07	Automated Statchk
Sum of cations, anions	CALC	8062538	N/A	2015/10/07	David Huang
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8062539	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8063995	N/A	2015/10/06	Andrew An
Elements by ICPMS Digested LL (total)	ICP/CRCM	8064153	2015/10/06	2015/10/07	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8062944	N/A	2015/10/07	Automated Statchk
Ammonia-N (Preserved)	KONE/COL	8065944	N/A	2015/10/07	Sherryl Flores
Nitrate+Nitrite (N) (low level)	TRAA/COL	8064553	N/A	2015/10/06	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8064554	N/A	2015/10/06	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8062947	N/A	2015/10/07	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
pH Water	AT/ALK	8065747	N/A	2015/10/07	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8064299	N/A	2015/10/06	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8063632	2015/10/06	2015/10/07	Liilia Iankovska
Total Suspended Solids-Low Level	BAL/BAL	8063665	2015/10/06	2015/10/07	Liilia Iankovska

Maxxam ID: NH5787
Sample ID: BC-39
Matrix: Water

Collected: 2015/09/29
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065730	2015/10/07	2015/10/07	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8064276	N/A	2015/10/06	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8064498	N/A	2015/10/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8064499	N/A	2015/10/06	Tatyana Serzhanova
Conductance - water	AT/ALK	8065734	N/A	2015/10/07	Maria Maclean
Hardness Total (calculated as CaCO3)	CALC	8062535	N/A	2015/10/07	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8062373	N/A	2015/10/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065644	N/A	2015/10/07	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8065423	2015/10/07	2015/10/07	Edwin Lamigo
Ion Balance	CALC	8062537	N/A	2015/10/07	Automated Statchk
Sum of cations, anions	CALC	8062538	N/A	2015/10/07	David Huang
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8062539	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8063995	N/A	2015/10/06	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8062944	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (total)	ICP/CRCM	8063964	N/A	2015/10/06	Andrew An
Ammonia-N (Preserved)	KONE/COL	8065944	N/A	2015/10/07	Sherryl Flores

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

TEST SUMMARY

Maxxam ID: NH5787
Sample ID: BC-39
Matrix: Water

Collected: 2015/09/29
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrate+Nitrite (N) (low level)	TRAA/COL	8064551	N/A	2015/10/06	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8064552	N/A	2015/10/06	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8062947	N/A	2015/10/07	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
pH Water	AT/ALK	8065736	N/A	2015/10/07	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8064280	N/A	2015/10/06	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8063632	2015/10/06	2015/10/07	Liilia Iankovska
Total Suspended Solids-Low Level	BAL/BAL	8063665	2015/10/06	2015/10/07	Liilia Iankovska

Maxxam ID: NH5787 Dup
Sample ID: BC-39
Matrix: Water

Collected: 2015/09/29
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE/COL	8064276	N/A	2015/10/06	Balwinder Bassi
Ammonia-N (Preserved)	KONE/COL	8065944	N/A	2015/10/07	Sherryl Flores
Sulphate by Automated Colourimetry	KONE/COL	8064280	N/A	2015/10/06	Balwinder Bassi

Maxxam ID: NH5788
Sample ID: BC-51W
Matrix: Water

Collected: 2015/09/30
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065730	2015/10/07	2015/10/07	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8069692	N/A	2015/10/09	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8064498	N/A	2015/10/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8064499	N/A	2015/10/06	Tatyana Serzhanova
Conductance - water	AT/ALK	8065734	N/A	2015/10/07	Maria Maclean
Hardness Total (calculated as CaCO3)	CALC	8062535	N/A	2015/10/07	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8068327	N/A	2015/10/09	David Huang
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065644	N/A	2015/10/07	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8065423	2015/10/07	2015/10/07	Edwin Lamigo
Ion Balance	CALC	8062537	N/A	2015/10/07	Andy Lu
Sum of cations, anions	CALC	8062538	N/A	2015/10/07	David Huang
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8068329	N/A	2015/10/09	David Huang
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8063995	N/A	2015/10/06	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8062944	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (total)	ICP/CRCM	8063964	N/A	2015/10/06	Andrew An
Ammonia-N (Preserved)	KONE/COL	8065944	N/A	2015/10/07	Sherryl Flores
Nitrate+Nitrite (N) (low level)	TRAA/COL	8064551	N/A	2015/10/06	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8064552	N/A	2015/10/06	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8062947	N/A	2015/10/07	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
pH Water	AT/ALK	8065736	N/A	2015/10/07	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8069702	N/A	2015/10/09	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8067102	2015/10/08	2015/10/09	Liilia Iankovska

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

TEST SUMMARY

Maxxam ID: NH5788
Sample ID: BC-51W
Matrix: Water

Collected: 2015/09/30
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Suspended Solids-Low Level	BAL/BAL	8065187	2015/10/07	2015/10/07	Liilia Iankovska

Maxxam ID: NH5789
Sample ID: BC-53
Matrix: Water

Collected: 2015/09/29
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065742	2015/10/07	2015/10/07	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8064297	N/A	2015/10/06	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8064498	N/A	2015/10/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8064499	N/A	2015/10/06	Tatyana Serzhanova
Conductance - water	AT/ALK	8065745	N/A	2015/10/07	Maria Maclean
Hardness Total (calculated as CaCO3)	CALC	8062535	N/A	2015/10/07	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8062373	N/A	2015/10/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065644	N/A	2015/10/07	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8065423	2015/10/07	2015/10/07	Edwin Lamigo
Ion Balance	CALC	8062537	N/A	2015/10/07	Automated Statchk
Sum of cations, anions	CALC	8062538	N/A	2015/10/07	David Huang
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8062539	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8063995	N/A	2015/10/06	Andrew An
Elements by ICPMS Digested LL (total)	ICP/CRCM	8064153	2015/10/06	2015/10/07	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8062944	N/A	2015/10/07	Automated Statchk
Ammonia-N (Preserved)	KONE/COL	8065944	N/A	2015/10/07	Sherryl Flores
Nitrate+Nitrite (N) (low level)	TRAA/COL	8064553	N/A	2015/10/06	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8064554	N/A	2015/10/06	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8062947	N/A	2015/10/07	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
pH Water	AT/ALK	8065747	N/A	2015/10/07	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8064299	N/A	2015/10/06	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8063632	2015/10/06	2015/10/07	Liilia Iankovska
Total Suspended Solids-Low Level	BAL/BAL	8063665	2015/10/06	2015/10/07	Liilia Iankovska

Maxxam ID: NH5790
Sample ID: BC-B
Matrix: Water

Collected:
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065730	2015/10/07	2015/10/07	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8064276	N/A	2015/10/06	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8064498	N/A	2015/10/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8064499	N/A	2015/10/06	Tatyana Serzhanova
Conductance - water	AT/ALK	8065734	N/A	2015/10/07	Maria Maclean
Hardness Total (calculated as CaCO3)	CALC	8062535	N/A	2015/10/07	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8062373	N/A	2015/10/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065644	N/A	2015/10/07	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8065423	2015/10/07	2015/10/07	Edwin Lamigo

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

TEST SUMMARY

Maxxam ID: NH5790
Sample ID: BC-B
Matrix: Water

Collected:
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ion Balance	CALC	8062537	N/A	2015/10/07	Automated Statchk
Sum of cations, anions	CALC	8062538	N/A	2015/10/07	David Huang
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8062539	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8063995	N/A	2015/10/06	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8062944	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (total)	ICP/CRCM	8063964	N/A	2015/10/06	Andrew An
Ammonia-N (Preserved)	KONE/COL	8065944	N/A	2015/10/07	Sherryl Flores
Nitrate+Nitrite (N) (low level)	TRAA/COL	8064551	N/A	2015/10/06	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8064552	N/A	2015/10/06	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8062947	N/A	2015/10/07	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
pH Water	AT/ALK	8065736	N/A	2015/10/07	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8064280	N/A	2015/10/06	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8063632	2015/10/06	2015/10/07	Liilia Iankovska
Total Suspended Solids-Low Level	BAL/BAL	8063665	2015/10/06	2015/10/07	Liilia Iankovska

Maxxam ID: NH5790 Dup
Sample ID: BC-B
Matrix: Water

Collected:
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8063995	N/A	2015/10/06	Andrew An
Elements by ICPMS Low Level (total)	ICP/CRCM	8063964	N/A	2015/10/06	Andrew An

Maxxam ID: NH5791
Sample ID: BC-A
Matrix: Water

Collected:
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065742	2015/10/07	2015/10/07	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8064297	N/A	2015/10/06	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8064498	N/A	2015/10/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8064499	N/A	2015/10/06	Tatyana Serzhanova
Conductance - water	AT/ALK	8065745	N/A	2015/10/07	Maria Maclean
Hardness Total (calculated as CaCO3)	CALC	8062535	N/A	2015/10/07	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8062373	N/A	2015/10/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065644	N/A	2015/10/07	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8065423	2015/10/07	2015/10/07	Edwin Lamigo
Ion Balance	CALC	8062537	N/A	2015/10/07	Automated Statchk
Sum of cations, anions	CALC	8062538	N/A	2015/10/07	David Huang
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8062539	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8063995	N/A	2015/10/06	Andrew An
Elements by ICPMS Digested LL (total)	ICP/CRCM	8064153	2015/10/06	2015/10/07	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8062944	N/A	2015/10/07	Automated Statchk
Ammonia-N (Preserved)	KONE/COL	8065944	N/A	2015/10/07	Sherryl Flores
Nitrate+Nitrite (N) (low level)	TRAA/COL	8064553	N/A	2015/10/06	Isaac Wang

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

TEST SUMMARY

Maxxam ID: NH5791
Sample ID: BC-A
Matrix: Water

Collected:
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrite (N) (low level)	TRAA/COL	8064554	N/A	2015/10/06	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8062947	N/A	2015/10/07	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
pH Water	AT/ALK	8065747	N/A	2015/10/07	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8064299	N/A	2015/10/06	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8063632	2015/10/06	2015/10/07	Liilia Iankovska
Total Suspended Solids-Low Level	BAL/BAL	8063665	2015/10/06	2015/10/07	Liilia Iankovska

Maxxam ID: NH5792
Sample ID: TRIP BLANK
Matrix: Water

Collected: 2015/10/05
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065742	2015/10/07	2015/10/07	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8064297	N/A	2015/10/06	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8064498	N/A	2015/10/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8064499	N/A	2015/10/06	Tatyana Serzhanova
Conductance - water	AT/ALK	8065745	N/A	2015/10/07	Maria Maclean
Hardness Total (calculated as CaCO3)	CALC	8062535	N/A	2015/10/07	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8062373	N/A	2015/10/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065644	N/A	2015/10/07	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8065423	2015/10/07	2015/10/07	Edwin Lamigo
Ion Balance	CALC	8062537	N/A	2015/10/07	David Huang
Sum of cations, anions	CALC	8062538	N/A	2015/10/07	David Huang
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8062539	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8063995	N/A	2015/10/06	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8062944	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (total)	ICP/CRCM	8063964	N/A	2015/10/06	Andrew An
Ammonia-N (Unpreserved)	KONE/COL	8065951	N/A	2015/10/07	Sherryl Flores
Nitrate+Nitrite (N) (low level)	TRAA/COL	8067921	N/A	2015/10/08	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8064554	N/A	2015/10/06	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8067176	N/A	2015/10/08	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
pH Water	AT/ALK	8065747	N/A	2015/10/07	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8064299	N/A	2015/10/06	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8063632	2015/10/06	2015/10/07	Liilia Iankovska
Total Suspended Solids-Low Level	BAL/BAL	8065187	2015/10/07	2015/10/07	Liilia Iankovska

Maxxam ID: NH5792 Dup
Sample ID: TRIP BLANK
Matrix: Water

Collected: 2015/10/05
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Cyanide SAD (strong acid dissociable)	TECH/COL	8064498	N/A	2015/10/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8064499	N/A	2015/10/06	Tatyana Serzhanova
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065644	N/A	2015/10/07	Edwin Lamigo

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

TEST SUMMARY

Maxxam ID: NH5792 Dup
Sample ID: TRIP BLANK
Matrix: Water

Collected: 2015/10/05
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury (Total-LowLevel) by CVAF	CV/AF	8065423	2015/10/07	2015/10/07	Edwin Lamigo

Maxxam ID: NH5799
Sample ID: BC-19
Matrix: Water

Collected: 2015/10/01
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065730	2015/10/07	2015/10/07	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8064276	N/A	2015/10/06	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8064498	N/A	2015/10/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8064499	N/A	2015/10/06	Tatyana Serzhanova
Conductance - water	AT/ALK	8065734	N/A	2015/10/07	Maria Maclean
Hardness (calculated as CaCO3)	CALC	8062373	N/A	2015/10/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065644	N/A	2015/10/07	Edwin Lamigo
Ion Balance	CALC	8062537	N/A	2015/10/07	Automated Statchk
Sum of cations, anions	CALC	8062538	N/A	2015/10/07	David Huang
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8062539	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8063995	N/A	2015/10/06	Andrew An
Ammonia-N (Preserved)	KONE/COL	8065944	N/A	2015/10/07	Sherryl Flores
Nitrate+Nitrite (N) (low level)	TRAA/COL	8064551	N/A	2015/10/06	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8064552	N/A	2015/10/06	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8062947	N/A	2015/10/07	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
pH Water	AT/ALK	8065736	N/A	2015/10/07	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8064280	N/A	2015/10/06	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8063535	2015/10/06	2015/10/07	Liilia Iankovska

Maxxam ID: NH5800
Sample ID: BC-21
Matrix: Water

Collected: 2015/09/30
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065730	2015/10/07	2015/10/07	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8069692	N/A	2015/10/09	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8064498	N/A	2015/10/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8064499	N/A	2015/10/06	Tatyana Serzhanova
Conductance - water	AT/ALK	8065734	N/A	2015/10/07	Maria Maclean
Hardness (calculated as CaCO3)	CALC	8068327	N/A	2015/10/09	Andy Lu
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065644	N/A	2015/10/07	Edwin Lamigo
Ion Balance	CALC	8062537	N/A	2015/10/07	Andy Lu
Sum of cations, anions	CALC	8062538	N/A	2015/10/07	Andy Lu
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8068329	N/A	2015/10/09	David Huang
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8063995	N/A	2015/10/06	Andrew An
Ammonia-N (Preserved)	KONE/COL	8065944	N/A	2015/10/07	Sherryl Flores
Nitrate+Nitrite (N) (low level)	TRAA/COL	8064551	N/A	2015/10/06	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8064552	N/A	2015/10/06	Isaac Wang

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

TEST SUMMARY

Maxxam ID: NH5800
Sample ID: BC-21
Matrix: Water

Collected: 2015/09/30
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrogen - Nitrate (as N)	CALC	8062947	N/A	2015/10/07	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
pH Water	AT/ALK	8065736	N/A	2015/10/07	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8064280	N/A	2015/10/06	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8063535	2015/10/06	2015/10/07	Liilia Iankovska

Maxxam ID: NH5801
Sample ID: BC-22
Matrix: Water

Collected: 2015/10/01
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065730	2015/10/07	2015/10/07	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8064276	N/A	2015/10/06	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8064498	N/A	2015/10/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8064499	N/A	2015/10/06	Tatyana Serzhanova
Conductance - water	AT/ALK	8065734	N/A	2015/10/07	Maria Maclean
Hardness (calculated as CaCO3)	CALC	8062373	N/A	2015/10/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065644	N/A	2015/10/07	Edwin Lamigo
Ion Balance	CALC	8062537	N/A	2015/10/07	Automated Statchk
Sum of cations, anions	CALC	8062538	N/A	2015/10/07	David Huang
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8062539	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8064011	N/A	2015/10/07	Andrew An
Ammonia-N (Preserved)	KONE/COL	8065944	N/A	2015/10/07	Sherryl Flores
Nitrate+Nitrite (N) (low level)	TRAA/COL	8064551	N/A	2015/10/06	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8064552	N/A	2015/10/06	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8062947	N/A	2015/10/07	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
pH Water	AT/ALK	8065736	N/A	2015/10/07	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8064280	N/A	2015/10/06	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8063535	2015/10/06	2015/10/07	Liilia Iankovska

Maxxam ID: NH5802
Sample ID: BC-27
Matrix: Water

Collected: 2015/09/30
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065730	2015/10/07	2015/10/07	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8064276	N/A	2015/10/06	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8064498	N/A	2015/10/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8064499	N/A	2015/10/06	Tatyana Serzhanova
Conductance - water	AT/ALK	8065734	N/A	2015/10/07	Maria Maclean
Hardness (calculated as CaCO3)	CALC	8062373	N/A	2015/10/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065644	N/A	2015/10/07	Edwin Lamigo
Ion Balance	CALC	8062537	N/A	2015/10/07	Automated Statchk
Sum of cations, anions	CALC	8062538	N/A	2015/10/07	David Huang
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8062539	N/A	2015/10/07	Automated Statchk

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

TEST SUMMARY

Maxxam ID: NH5802
Sample ID: BC-27
Matrix: Water

Collected: 2015/09/30
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8064011	N/A	2015/10/07	Andrew An
Ammonia-N (Preserved)	KONE/COL	8065946	N/A	2015/10/07	Sherryl Flores
Nitrate+Nitrite (N) (low level)	TRAA/COL	8064551	N/A	2015/10/06	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8064552	N/A	2015/10/06	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8062947	N/A	2015/10/07	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
pH Water	AT/ALK	8065736	N/A	2015/10/07	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8064280	N/A	2015/10/06	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8063535	2015/10/06	2015/10/07	Liilia Iankovska

Maxxam ID: NH5803
Sample ID: BC-65
Matrix: Water

Collected: 2015/10/01
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065730	2015/10/07	2015/10/07	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8064276	N/A	2015/10/06	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8064498	N/A	2015/10/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8064499	N/A	2015/10/06	Tatyana Serzhanova
Conductance - water	AT/ALK	8065734	N/A	2015/10/07	Maria Maclean
Hardness (calculated as CaCO3)	CALC	8062373	N/A	2015/10/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065644	N/A	2015/10/07	Edwin Lamigo
Ion Balance	CALC	8062537	N/A	2015/10/07	Automated Statchk
Sum of cations, anions	CALC	8062538	N/A	2015/10/07	David Huang
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8062539	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8064011	N/A	2015/10/07	Andrew An
Ammonia-N (Preserved)	KONE/COL	8065946	N/A	2015/10/07	Sherryl Flores
Nitrate+Nitrite (N) (low level)	TRAA/COL	8064551	N/A	2015/10/06	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8064552	N/A	2015/10/06	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8062947	N/A	2015/10/07	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
pH Water	AT/ALK	8065736	N/A	2015/10/07	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8064280	N/A	2015/10/06	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8063535	2015/10/06	2015/10/07	Liilia Iankovska

Maxxam ID: NH5804
Sample ID: BC-66
Matrix: Water

Collected: 2015/10/01
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065730	2015/10/07	2015/10/07	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8064276	N/A	2015/10/06	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8064498	N/A	2015/10/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8064499	N/A	2015/10/06	Tatyana Serzhanova
Conductance - water	AT/ALK	8065734	N/A	2015/10/07	Maria Maclean
Hardness (calculated as CaCO3)	CALC	8062373	N/A	2015/10/07	Automated Statchk

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

TEST SUMMARY

Maxxam ID: NH5804
Sample ID: BC-66
Matrix: Water

Collected: 2015/10/01
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065644	N/A	2015/10/07	Edwin Lamigo
Ion Balance	CALC	8062537	N/A	2015/10/07	Automated Statchk
Sum of cations, anions	CALC	8062538	N/A	2015/10/07	David Huang
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8062539	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8064011	N/A	2015/10/07	Andrew An
Ammonia-N (Preserved)	KONE/COL	8065943	N/A	2015/10/07	Sherryl Flores
Nitrate+Nitrite (N) (low level)	TRAA/COL	8064551	N/A	2015/10/06	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8064552	N/A	2015/10/06	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8062947	N/A	2015/10/07	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
pH Water	AT/ALK	8065736	N/A	2015/10/07	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8064280	N/A	2015/10/06	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8063535	2015/10/06	2015/10/07	Liilia Iankovska

Maxxam ID: NH5804 Dup
Sample ID: BC-66
Matrix: Water

Collected: 2015/10/01
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonia-N (Preserved)	KONE/COL	8065943	N/A	2015/10/07	Sherryl Flores

Maxxam ID: NH5805
Sample ID: BC-67
Matrix: Water

Collected: 2015/09/30
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065730	2015/10/07	2015/10/07	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8064297	N/A	2015/10/06	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8064498	N/A	2015/10/06	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8064499	N/A	2015/10/06	Tatyana Serzhanova
Conductance - water	AT/ALK	8065734	N/A	2015/10/07	Maria Maclean
Hardness (calculated as CaCO3)	CALC	8062373	N/A	2015/10/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065644	N/A	2015/10/07	Edwin Lamigo
Ion Balance	CALC	8062537	N/A	2015/10/07	Automated Statchk
Sum of cations, anions	CALC	8062538	N/A	2015/10/07	David Huang
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8062539	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8064011	N/A	2015/10/07	Andrew An
Ammonia-N (Preserved)	KONE/COL	8065943	N/A	2015/10/07	Sherryl Flores
Nitrate+Nitrite (N) (low level)	TRAA/COL	8064553	N/A	2015/10/06	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8064554	N/A	2015/10/06	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8062947	N/A	2015/10/07	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
pH Water	AT/ALK	8065736	N/A	2015/10/07	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8064299	N/A	2015/10/06	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8063535	2015/10/06	2015/10/07	Liilia Iankovska

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

TEST SUMMARY

Maxxam ID: NH5806
Sample ID: BC-69
Matrix: Water

Collected: 2015/09/30
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065730	2015/10/07	2015/10/07	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8064276	N/A	2015/10/06	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8065639	N/A	2015/10/07	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8065645	N/A	2015/10/07	Tatyana Serzhanova
Conductance - water	AT/ALK	8065734	N/A	2015/10/07	Maria Maclean
Hardness (calculated as CaCO3)	CALC	8062373	N/A	2015/10/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065644	N/A	2015/10/07	Edwin Lamigo
Ion Balance	CALC	8062537	N/A	2015/10/07	Automated Statchk
Sum of cations, anions	CALC	8062538	N/A	2015/10/07	David Huang
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8062539	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8064011	N/A	2015/10/07	Andrew An
Ammonia-N (Preserved)	KONE/COL	8065944	N/A	2015/10/07	Sherryl Flores
Nitrate+Nitrite (N) (low level)	TRAA/COL	8064551	N/A	2015/10/06	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8064552	N/A	2015/10/06	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8062947	N/A	2015/10/07	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
pH Water	AT/ALK	8065736	N/A	2015/10/07	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8065781	N/A	2015/10/07	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8063632	2015/10/06	2015/10/07	Liilia Iankovska

Maxxam ID: NH5806 Dup
Sample ID: BC-69
Matrix: Water

Collected: 2015/09/30
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Cyanide SAD (strong acid dissociable)	TECH/COL	8065639	N/A	2015/10/07	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8065645	N/A	2015/10/07	Tatyana Serzhanova

Maxxam ID: NH5807
Sample ID: BC-C
Matrix: Water

Collected:
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065730	2015/10/07	2015/10/07	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8064276	N/A	2015/10/06	Balwinder Bassi
Cyanide SAD (strong acid dissociable)	TECH/COL	8065639	N/A	2015/10/07	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8065645	N/A	2015/10/07	Tatyana Serzhanova
Conductance - water	AT/ALK	8065734	N/A	2015/10/07	Maria Maclean
Hardness (calculated as CaCO3)	CALC	8062373	N/A	2015/10/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065644	N/A	2015/10/07	Edwin Lamigo
Ion Balance	CALC	8062537	N/A	2015/10/07	Automated Statchk
Sum of cations, anions	CALC	8062538	N/A	2015/10/07	David Huang
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8062539	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8064011	N/A	2015/10/07	Andrew An
Ammonia-N (Preserved)	KONE/COL	8065944	N/A	2015/10/07	Sherryl Flores
Nitrate+Nitrite (N) (low level)	TRAA/COL	8064551	N/A	2015/10/06	Isaac Wang

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

TEST SUMMARY

Maxxam ID: NH5807
Sample ID: BC-C
Matrix: Water

Collected:
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Nitrite (N) (low level)	TRAA/COL	8064552	N/A	2015/10/06	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8062947	N/A	2015/10/07	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
pH Water	AT/ALK	8065736	N/A	2015/10/07	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8064280	N/A	2015/10/06	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8063632	2015/10/06	2015/10/07	Liilia Iankovska

Maxxam ID: NH5807 Dup
Sample ID: BC-C
Matrix: Water

Collected:
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065730	2015/10/07	2015/10/07	Maria Maclean
Conductance - water	AT/ALK	8065734	N/A	2015/10/07	Maria Maclean
pH Water	AT/ALK	8065736	N/A	2015/10/07	Maria Maclean

Maxxam ID: NH5814
Sample ID: BC-10
Matrix: Water

Collected: 2015/09/30
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065730	2015/10/07	2015/10/07	Maria Maclean
Conductance - water	AT/ALK	8065734	N/A	2015/10/07	Maria Maclean
Hardness Total (calculated as CaCO3)	CALC	8062535	N/A	2015/10/07	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8062373	N/A	2015/10/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065739	N/A	2015/10/07	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8065423	2015/10/07	2015/10/07	Edwin Lamigo
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8062539	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8064011	N/A	2015/10/07	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8062944	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (total)	ICP/CRCM	8063964	N/A	2015/10/06	Andrew An
Ammonia-N (Preserved)	KONE/COL	8065943	N/A	2015/10/07	Sherryl Flores
Nitrate+Nitrite (N) (low level)	TRAA/COL	8064551	N/A	2015/10/06	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8064552	N/A	2015/10/06	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8062947	N/A	2015/10/07	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
pH Water	AT/ALK	8065736	N/A	2015/10/07	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8064280	N/A	2015/10/06	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8063632	2015/10/06	2015/10/07	Liilia Iankovska
Total Suspended Solids-Low Level	BAL/BAL	8065187	2015/10/07	2015/10/07	Liilia Iankovska

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

TEST SUMMARY

Maxxam ID: NH5815
Sample ID: BC-12
Matrix: Water

Collected: 2015/09/30
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065742	2015/10/07	2015/10/07	Maria Maclean
Conductance - water	AT/ALK	8065745	N/A	2015/10/07	Maria Maclean
Hardness Total (calculated as CaCO3)	CALC	8062535	N/A	2015/10/07	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8062373	N/A	2015/10/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065739	N/A	2015/10/07	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8065423	2015/10/07	2015/10/07	Edwin Lamigo
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8062539	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8064011	N/A	2015/10/07	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8062944	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (total)	ICP/CRCM	8063964	N/A	2015/10/06	Andrew An
Ammonia-N (Preserved)	KONE/COL	8065944	N/A	2015/10/07	Sherryl Flores
Nitrate+Nitrite (N) (low level)	TRAA/COL	8064553	N/A	2015/10/06	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8064554	N/A	2015/10/06	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8062947	N/A	2015/10/07	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
pH Water	AT/ALK	8065747	N/A	2015/10/07	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8064872	N/A	2015/10/06	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8063632	2015/10/06	2015/10/07	Liilia Iankovska
Total Suspended Solids-Low Level	BAL/BAL	8065187	2015/10/07	2015/10/07	Liilia Iankovska

Maxxam ID: NH5816
Sample ID: BC-15
Matrix: Water

Collected: 2015/09/30
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065730	2015/10/07	2015/10/07	Maria Maclean
Conductance - water	AT/ALK	8065734	N/A	2015/10/07	Maria Maclean
Hardness Total (calculated as CaCO3)	CALC	8062535	N/A	2015/10/07	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8062373	N/A	2015/10/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065739	N/A	2015/10/07	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8065423	2015/10/07	2015/10/07	Edwin Lamigo
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8062539	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8064011	N/A	2015/10/07	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8062944	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (total)	ICP/CRCM	8063964	N/A	2015/10/06	Andrew An
Ammonia-N (Preserved)	KONE/COL	8065944	N/A	2015/10/07	Sherryl Flores
Nitrate+Nitrite (N) (low level)	TRAA/COL	8064551	N/A	2015/10/06	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8064552	N/A	2015/10/06	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8062947	N/A	2015/10/07	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
pH Water	AT/ALK	8065736	N/A	2015/10/07	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8064280	N/A	2015/10/06	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8063632	2015/10/06	2015/10/07	Liilia Iankovska
Total Suspended Solids-Low Level	BAL/BAL	8065187	2015/10/07	2015/10/07	Liilia Iankovska

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

TEST SUMMARY

Maxxam ID: NH5816 Dup
Sample ID: BC-15
Matrix: Water

Collected: 2015/09/30
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065730	2015/10/07	2015/10/07	Maria Maclean
Conductance - water	AT/ALK	8065734	N/A	2015/10/07	Maria Maclean
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065739	N/A	2015/10/07	Edwin Lamigo
pH Water	AT/ALK	8065736	N/A	2015/10/07	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8064280	N/A	2015/10/06	Balwinder Bassi

Maxxam ID: NH5817
Sample ID: BC-17
Matrix: Water

Collected: 2015/09/30
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065730	2015/10/07	2015/10/07	Maria Maclean
Conductance - water	AT/ALK	8065734	N/A	2015/10/07	Maria Maclean
Hardness Total (calculated as CaCO3)	CALC	8062535	N/A	2015/10/07	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8062373	N/A	2015/10/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065739	N/A	2015/10/07	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8065423	2015/10/07	2015/10/07	Edwin Lamigo
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8062539	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8064011	N/A	2015/10/07	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8062944	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (total)	ICP/CRCM	8063964	N/A	2015/10/06	Andrew An
Ammonia-N (Preserved)	KONE/COL	8065943	N/A	2015/10/07	Sherryl Flores
Nitrate+Nitrite (N) (low level)	TRAA/COL	8064551	N/A	2015/10/06	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8064552	N/A	2015/10/06	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8062947	N/A	2015/10/07	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
pH Water	AT/ALK	8065736	N/A	2015/10/07	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8065781	N/A	2015/10/07	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8063632	2015/10/06	2015/10/07	Liilia Iankovska
Total Suspended Solids-Low Level	BAL/BAL	8065187	2015/10/07	2015/10/07	Liilia Iankovska

Maxxam ID: NH5829
Sample ID: BC-3
Matrix: Water

Collected: 2015/09/29
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065742	2015/10/07	2015/10/07	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8064871	N/A	2015/10/06	Balwinder Bassi
Conductance - water	AT/ALK	8065745	N/A	2015/10/07	Maria Maclean
Hardness Total (calculated as CaCO3)	CALC	8062535	N/A	2015/10/07	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8062373	N/A	2015/10/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065739	N/A	2015/10/07	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8065423	2015/10/07	2015/10/07	Edwin Lamigo
Ion Balance	CALC	8062537	N/A	2015/10/07	Automated Statchk
Sum of cations, anions	CALC	8062538	N/A	2015/10/07	David Huang
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8062539	N/A	2015/10/07	Automated Statchk

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

TEST SUMMARY

Maxxam ID: NH5829
Sample ID: BC-3
Matrix: Water

Collected: 2015/09/29
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8064011	N/A	2015/10/07	Andrew An
Elements by ICPMS Digested LL (total)	ICP/CRCM	8064153	2015/10/06	2015/10/07	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8062944	N/A	2015/10/07	Automated Statchk
Ammonia-N (Preserved)	KONE/COL	8065944	N/A	2015/10/07	Sherryl Flores
Nitrate+Nitrite (N) (low level)	TRAA/COL	8064553	N/A	2015/10/06	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8064554	N/A	2015/10/06	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8062947	N/A	2015/10/07	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
pH Water	AT/ALK	8065747	N/A	2015/10/07	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8064872	N/A	2015/10/06	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8063632	2015/10/06	2015/10/07	Liilia Iankovska
Total Suspended Solids-Low Level	BAL/BAL	8063665	2015/10/06	2015/10/07	Liilia Iankovska

Maxxam ID: NH5829 Dup
Sample ID: BC-3
Matrix: Water

Collected: 2015/09/29
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Chloride by Automated Colourimetry	KONE/COL	8064871	N/A	2015/10/06	Balwinder Bassi
Sulphate by Automated Colourimetry	KONE/COL	8064872	N/A	2015/10/06	Balwinder Bassi

Maxxam ID: NH5830
Sample ID: BC-4
Matrix: Water

Collected: 2015/09/29
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065730	2015/10/07	2015/10/07	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8064276	N/A	2015/10/06	Balwinder Bassi
Conductance - water	AT/ALK	8065734	N/A	2015/10/07	Maria Maclean
Hardness Total (calculated as CaCO3)	CALC	8062535	N/A	2015/10/07	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8062373	N/A	2015/10/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065739	N/A	2015/10/07	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8065423	2015/10/07	2015/10/07	Edwin Lamigo
Ion Balance	CALC	8062537	N/A	2015/10/07	Automated Statchk
Sum of cations, anions	CALC	8062538	N/A	2015/10/07	David Huang
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8062539	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8064011	N/A	2015/10/07	Andrew An
Elements by ICPMS Digested LL (total)	ICP/CRCM	8064153	2015/10/06	2015/10/07	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8062944	N/A	2015/10/07	Automated Statchk
Ammonia-N (Preserved)	KONE/COL	8065943	N/A	2015/10/07	Sherryl Flores
Nitrate+Nitrite (N) (low level)	TRAA/COL	8064551	N/A	2015/10/06	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8064552	N/A	2015/10/06	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8062947	N/A	2015/10/07	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
pH Water	AT/ALK	8065736	N/A	2015/10/07	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8065781	N/A	2015/10/07	Balwinder Bassi

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

TEST SUMMARY

Maxxam ID: NH5830
Sample ID: BC-4
Matrix: Water

Collected: 2015/09/29
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8063632	2015/10/06	2015/10/07	Liilia Iankovska
Total Suspended Solids-Low Level	BAL/BAL	8063665	2015/10/06	2015/10/07	Liilia Iankovska

Maxxam ID: NH5831
Sample ID: BC-5
Matrix: Water

Collected: 2015/09/29
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Alkalinity - Water	AT/ALK	8065742	2015/10/07	2015/10/07	Maria Maclean
Chloride by Automated Colourimetry	KONE/COL	8064297	N/A	2015/10/06	Balwinder Bassi
Conductance - water	AT/ALK	8065745	N/A	2015/10/07	Maria Maclean
Hardness Total (calculated as CaCO3)	CALC	8062535	N/A	2015/10/07	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8062373	N/A	2015/10/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065739	N/A	2015/10/07	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8065423	2015/10/07	2015/10/07	Edwin Lamigo
Ion Balance	CALC	8062537	N/A	2015/10/07	Automated Statchk
Sum of cations, anions	CALC	8062538	N/A	2015/10/07	David Huang
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8062539	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8064011	N/A	2015/10/07	Andrew An
Elements by ICPMS Digested LL (total)	ICP/CRCM	8064153	2015/10/06	2015/10/07	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8062944	N/A	2015/10/07	Automated Statchk
Ammonia-N (Preserved)	KONE/COL	8065943	N/A	2015/10/07	Sherryl Flores
Nitrate+Nitrite (N) (low level)	TRAA/COL	8064553	N/A	2015/10/06	Isaac Wang
Nitrite (N) (low level)	TRAA/COL	8064554	N/A	2015/10/06	Isaac Wang
Nitrogen - Nitrate (as N)	CALC	8062947	N/A	2015/10/07	Automated Statchk
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
pH Water	AT/ALK	8065747	N/A	2015/10/07	Maria Maclean
Sulphate by Automated Colourimetry	KONE/COL	8064299	N/A	2015/10/06	Balwinder Bassi
Total Dissolved Solids (Filt. Residue)	BAL/BAL	8063632	2015/10/06	2015/10/07	Liilia Iankovska
Total Suspended Solids-Low Level	BAL/BAL	8063665	2015/10/06	2015/10/07	Liilia Iankovska

Maxxam ID: NH5832
Sample ID: BC-28
Matrix: Water

Collected: 2015/10/01
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Cyanide SAD (strong acid dissociable)	TECH/COL	8065639	N/A	2015/10/07	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8065645	N/A	2015/10/07	Tatyana Serzhanova
Hardness Total (calculated as CaCO3)	CALC	8062535	N/A	2015/10/07	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8062373	N/A	2015/10/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065739	N/A	2015/10/07	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8065423	2015/10/07	2015/10/07	Edwin Lamigo
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8062539	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8064011	N/A	2015/10/07	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8062944	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (total)	ICP/CRCM	8063964	N/A	2015/10/06	Andrew An

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

TEST SUMMARY

Maxxam ID: NH5832
Sample ID: BC-28
Matrix: Water

Collected: 2015/10/01
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Ammonia-N (Preserved)	KONE/COL	8065944	N/A	2015/10/07	Sherryl Flores
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
Total Suspended Solids-Low Level	BAL/BAL	8065187	2015/10/07	2015/10/07	Liilia Iankovska

Maxxam ID: NH5833
Sample ID: BC-28A
Matrix: Water

Collected: 2015/10/01
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Cyanide SAD (strong acid dissociable)	TECH/COL	8065639	N/A	2015/10/07	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8065645	N/A	2015/10/07	Tatyana Serzhanova
Hardness Total (calculated as CaCO3)	CALC	8062535	N/A	2015/10/07	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8062373	N/A	2015/10/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065739	N/A	2015/10/07	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8065423	2015/10/07	2015/10/07	Edwin Lamigo
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8062539	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8064011	N/A	2015/10/07	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8062944	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (total)	ICP/CRCM	8063964	N/A	2015/10/06	Andrew An
Ammonia-N (Preserved)	KONE/COL	8065944	N/A	2015/10/07	Sherryl Flores
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
Total Suspended Solids-Low Level	BAL/BAL	8065187	2015/10/07	2015/10/07	Liilia Iankovska

Maxxam ID: NH5834
Sample ID: BC-28B
Matrix: Water

Collected: 2015/10/01
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Cyanide SAD (strong acid dissociable)	TECH/COL	8065639	N/A	2015/10/07	Tatyana Serzhanova
Cyanide WAD (weak acid dissociable)	TECH/COL	8065645	N/A	2015/10/07	Tatyana Serzhanova
Hardness Total (calculated as CaCO3)	CALC	8063616	N/A	2015/10/07	Automated Statchk
Hardness (calculated as CaCO3)	CALC	8062373	N/A	2015/10/07	Automated Statchk
Mercury (Dissolved-LowLevel) by CVAF	CV/AF	8065739	N/A	2015/10/07	Edwin Lamigo
Mercury (Total-LowLevel) by CVAF	CV/AF	8065423	2015/10/07	2015/10/07	Edwin Lamigo
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	ICP/CRCM	8062539	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8064011	N/A	2015/10/07	Andrew An
Na, K, Ca, Mg, S by CRC ICPMS (total)	ICP/CRCM	8063617	N/A	2015/10/07	Automated Statchk
Elements by ICPMS Low Level (total)	ICP/CRCM	8063964	N/A	2015/10/06	Andrew An
Ammonia-N (Preserved)	KONE/COL	8065943	N/A	2015/10/07	Sherryl Flores
Filter and HNO3 Preserve for Metals	ICP	8063468	N/A	2015/10/07	Lucy Luo
Total Suspended Solids-Low Level	BAL/BAL	8065187	2015/10/07	2015/10/07	Liilia Iankovska

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

TEST SUMMARY

Maxxam ID: NH5834 Dup
Sample ID: BC-28B
Matrix: Water

Collected: 2015/10/01
Shipped:
Received: 2015/10/05

Test Description	Instrumentation	Batch	Extracted	Date Analyzed	Analyst
Elements by ICPMS Low Level (dissolved)	ICP/CRCM	8064011	N/A	2015/10/07	Andrew An

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GENERAL COMMENTS

Each temperature is the average of up to three cooler temperatures taken at receipt

Package 1	4.3°C
Package 2	4.0°C
Package 3	3.3°C
Package 4	5.7°C
Package 5	3.0°C
Package 6	3.7°C
Package 7	3.7°C

Sample NH5782-01 : Sample analyzed for digested low level metals due to sediment in sample. This results in an increased reportable detection limit for Al B Ba Bi Cr Co Cu Fe Mn Ni P Pb Sb Si Ti U V and Zn.

Sample NH5783-01 : Sample analyzed for digested low level metals due to sediment in sample. This results in an increased reportable detection limit for Al B Ba Bi Cr Co Cu Fe Mn Ni P Pb Sb Si Ti U V and Zn.

Sample NH5785-01 : Sample analyzed for digested low level metals due to sediment in sample. This results in an increased reportable detection limit for Al B Ba Bi Cr Co Cu Fe Mn Ni P Pb Sb Si Ti U V and Zn.

Sample NH5786-01 : Sample analyzed for digested low level metals due to sediment in sample. This results in an increased reportable detection limit for Al B Ba Bi Cr Co Cu Fe Mn Ni P Pb Sb Si Ti U V and Zn.

Sample NH5789-01 : Sample analyzed for digested low level metals due to sediment in sample. This results in an increased reportable detection limit for Al B Ba Bi Cr Co Cu Fe Mn Ni P Pb Sb Si Ti U V and Zn.

Sample NH5791-01 : Sample analyzed for digested low level metals due to sediment in sample. This results in an increased reportable detection limit for Al B Ba Bi Cr Co Cu Fe Mn Ni P Pb Sb Si Ti U V and Zn.

Sample NH5799-01 : Effective October 1, 2013, the BC MOE SAMPLE PRESERVATION & HOLDING TIME REQUIREMENTS states that Mercury in water requires a glass or PTFE container with Hydrochloric Acid (HCl) preservation. Sample container and preservation received was not in compliance. Maxxam added HCl to stabilize Mercury in this sample prior to analysis.

Sample NH5800-01 : Effective October 1, 2013, the BC MOE SAMPLE PRESERVATION & HOLDING TIME REQUIREMENTS states that Mercury in water requires a glass or PTFE container with Hydrochloric Acid (HCl) preservation. Sample container and preservation received was not in compliance. Maxxam added HCl to stabilize Mercury in this sample prior to analysis.

Sample NH5801-01 : Effective October 1, 2013, the BC MOE SAMPLE PRESERVATION & HOLDING TIME REQUIREMENTS states that Mercury in water requires a glass or PTFE container with Hydrochloric Acid (HCl) preservation. Sample container and preservation received was not in compliance. Maxxam added HCl to stabilize Mercury in this sample prior to analysis.

Sample NH5802-01 : Effective October 1, 2013, the BC MOE SAMPLE PRESERVATION & HOLDING TIME REQUIREMENTS states that Mercury in water requires a glass or PTFE container with Hydrochloric Acid (HCl) preservation. Sample container and preservation received was not in compliance. Maxxam added HCl to stabilize Mercury in this sample prior to analysis.

Sample NH5805-01 : Effective October 1, 2013, the BC MOE SAMPLE PRESERVATION & HOLDING TIME REQUIREMENTS states that Mercury in water requires a glass or PTFE container with Hydrochloric Acid (HCl) preservation. Sample container and preservation received was not in compliance. Maxxam added HCl to stabilize Mercury in this sample prior to analysis.

Sample NH5806-01 : Effective October 1, 2013, the BC MOE SAMPLE PRESERVATION & HOLDING TIME REQUIREMENTS states that Mercury in water requires a glass or PTFE container with Hydrochloric Acid (HCl) preservation. Sample container and preservation received was not in compliance. Maxxam added HCl to stabilize Mercury in this sample prior to analysis.

Sample NH5829-01 : Sample analyzed for digested low level metals due to sediment in sample. This results in an increased reportable detection limit for Al B Ba Bi Cr Co Cu Fe Mn Ni P Pb Sb Si Ti U V and Zn.

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

GENERAL COMMENTS

Sample NH5830-01 : Sample analyzed for digested low level metals due to sediment in sample. This results in an increased reportable detection limit for Al B Ba Bi Cr Co Cu Fe Mn Ni P Pb Sb Si Ti U V and Zn.

Sample NH5831-01 : Sample analyzed for digested low level metals due to sediment in sample. This results in an increased reportable detection limit for Al B Ba Bi Cr Co Cu Fe Mn Ni P Pb Sb Si Ti U V and Zn.

Sample NH5785, Elements by ICPMS Low Level (dissolved): Test repeated.
Sample NH5800, Na, K, Ca, Mg, S by CRC ICPMS (diss.): Test repeated.

Results relate only to the items tested.

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Maxxam Job #: B587453
Report Date: 2015/10/13

QUALITY ASSURANCE REPORT

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8063535	Total Dissolved Solids	2015/10/07	102	80 - 120	100	80 - 120	<10	mg/L		
8063632	Total Dissolved Solids	2015/10/07	104	80 - 120	102	80 - 120	<10	mg/L	14	20
8063665	Total Suspended Solids	2015/10/07			99	80 - 120	<1.0	mg/L		
8063964	Total Aluminum (Al)	2015/10/06	103	80 - 120	105	80 - 120	<0.00050	mg/L	NC	20
8063964	Total Antimony (Sb)	2015/10/06	102	80 - 120	103	80 - 120	<0.000020	mg/L	NC	20
8063964	Total Arsenic (As)	2015/10/06	102	80 - 120	99	80 - 120	<0.000020	mg/L	NC	20
8063964	Total Barium (Ba)	2015/10/06	105	80 - 120	106	80 - 120	<0.000020	mg/L	NC	20
8063964	Total Beryllium (Be)	2015/10/06	104	80 - 120	103	80 - 120	<0.000010	mg/L	NC	20
8063964	Total Bismuth (Bi)	2015/10/06	104	80 - 120	105	80 - 120	<0.0000050	mg/L	NC	20
8063964	Total Boron (B)	2015/10/06					<0.010	mg/L	NC	20
8063964	Total Cadmium (Cd)	2015/10/06	104	80 - 120	100	80 - 120	<0.0000050	mg/L	NC	20
8063964	Total Chromium (Cr)	2015/10/06	102	80 - 120	103	80 - 120	<0.00010	mg/L	NC	20
8063964	Total Cobalt (Co)	2015/10/06	107	80 - 120	108	80 - 120	<0.0000050	mg/L	NC	20
8063964	Total Copper (Cu)	2015/10/06	105	80 - 120	104	80 - 120	<0.000050	mg/L	NC	20
8063964	Total Iron (Fe)	2015/10/06	106	80 - 120	107	80 - 120	<0.0010	mg/L	NC	20
8063964	Total Lead (Pb)	2015/10/06	107	80 - 120	110	80 - 120	<0.0000050	mg/L	7.2	20
8063964	Total Lithium (Li)	2015/10/06	95	80 - 120	102	80 - 120	<0.00050	mg/L	NC	20
8063964	Total Manganese (Mn)	2015/10/06	101	80 - 120	102	80 - 120	<0.000050	mg/L	NC	20
8063964	Total Molybdenum (Mo)	2015/10/06	96	80 - 120	99	80 - 120	<0.000050	mg/L	NC	20
8063964	Total Nickel (Ni)	2015/10/06	103	80 - 120	103	80 - 120	<0.000020	mg/L	NC	20
8063964	Total Phosphorus (P)	2015/10/06					<0.0020	mg/L	NC	20
8063964	Total Selenium (Se)	2015/10/06	107	80 - 120	98	80 - 120	<0.000040	mg/L	NC	20
8063964	Total Silicon (Si)	2015/10/06					<0.050	mg/L	NC	20
8063964	Total Silver (Ag)	2015/10/06	102	80 - 120	96	80 - 120	<0.0000050	mg/L	NC	20
8063964	Total Strontium (Sr)	2015/10/06	98	80 - 120	98	80 - 120	<0.000050	mg/L	NC	20
8063964	Total Thallium (Tl)	2015/10/06	104	80 - 120	106	80 - 120	<0.0000020	mg/L	NC	20
8063964	Total Tin (Sn)	2015/10/06	98	80 - 120	100	80 - 120	<0.00020	mg/L	NC	20
8063964	Total Titanium (Ti)	2015/10/06	102	80 - 120	97	80 - 120	<0.00050	mg/L	NC	20
8063964	Total Uranium (U)	2015/10/06	106	80 - 120	109	80 - 120	<0.0000020	mg/L	NC	20
8063964	Total Vanadium (V)	2015/10/06	101	80 - 120	102	80 - 120	<0.00020	mg/L	NC	20
8063964	Total Zinc (Zn)	2015/10/06	111	80 - 120	101	80 - 120	<0.00010	mg/L	13	20
8063964	Total Zirconium (Zr)	2015/10/06					<0.00010	mg/L	NC	20

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8063995	Dissolved Aluminum (Al)	2015/10/06	105	80 - 120	110	80 - 120	<0.00050	mg/L	NC	20
8063995	Dissolved Antimony (Sb)	2015/10/06	106	80 - 120	105	80 - 120	<0.000020	mg/L	NC	20
8063995	Dissolved Arsenic (As)	2015/10/06	104	80 - 120	103	80 - 120	<0.000020	mg/L	NC	20
8063995	Dissolved Barium (Ba)	2015/10/06	107	80 - 120	107	80 - 120	<0.000020	mg/L	NC	20
8063995	Dissolved Beryllium (Be)	2015/10/06	105	80 - 120	105	80 - 120	<0.000010	mg/L	NC	20
8063995	Dissolved Bismuth (Bi)	2015/10/06	98	80 - 120	97	80 - 120	<0.0000050	mg/L	NC	20
8063995	Dissolved Boron (B)	2015/10/06					<0.010	mg/L	NC	20
8063995	Dissolved Cadmium (Cd)	2015/10/06	99	80 - 120	98	80 - 120	<0.0000050	mg/L	NC	20
8063995	Dissolved Chromium (Cr)	2015/10/06	100	80 - 120	100	80 - 120	<0.00010	mg/L	NC	20
8063995	Dissolved Cobalt (Co)	2015/10/06	106	80 - 120	103	80 - 120	<0.0000050	mg/L	NC	20
8063995	Dissolved Copper (Cu)	2015/10/06	102	80 - 120	100	80 - 120	<0.000050	mg/L	NC	20
8063995	Dissolved Iron (Fe)	2015/10/06	105	80 - 120	104	80 - 120	<0.0010	mg/L	NC	20
8063995	Dissolved Lead (Pb)	2015/10/06	101	80 - 120	101	80 - 120	<0.0000050	mg/L	NC	20
8063995	Dissolved Lithium (Li)	2015/10/06	103	80 - 120	105	80 - 120	<0.00050	mg/L	NC	20
8063995	Dissolved Manganese (Mn)	2015/10/06	100	80 - 120	98	80 - 120	<0.000050	mg/L	NC	20
8063995	Dissolved Molybdenum (Mo)	2015/10/06	94	80 - 120	100	80 - 120	<0.000050	mg/L	NC	20
8063995	Dissolved Nickel (Ni)	2015/10/06	102	80 - 120	99	80 - 120	<0.000020	mg/L	NC	20
8063995	Dissolved Phosphorus (P)	2015/10/06					<0.0020	mg/L	NC	20
8063995	Dissolved Selenium (Se)	2015/10/06	103	80 - 120	98	80 - 120	<0.000040	mg/L	NC	20
8063995	Dissolved Silicon (Si)	2015/10/06					<0.050	mg/L	NC	20
8063995	Dissolved Silver (Ag)	2015/10/06	102	80 - 120	102	80 - 120	<0.0000050	mg/L	NC	20
8063995	Dissolved Strontium (Sr)	2015/10/06	99	80 - 120	99	80 - 120	<0.000050	mg/L	NC	20
8063995	Dissolved Thallium (Tl)	2015/10/06	97	80 - 120	97	80 - 120	<0.0000020	mg/L	NC	20
8063995	Dissolved Tin (Sn)	2015/10/06	96	80 - 120	102	80 - 120	<0.00020	mg/L	NC	20
8063995	Dissolved Titanium (Ti)	2015/10/06	98	80 - 120	100	80 - 120	<0.00050	mg/L	NC	20
8063995	Dissolved Uranium (U)	2015/10/06	100	80 - 120	100	80 - 120	<0.0000020	mg/L	NC	20
8063995	Dissolved Vanadium (V)	2015/10/06	102	80 - 120	100	80 - 120	<0.00020	mg/L	NC	20
8063995	Dissolved Zinc (Zn)	2015/10/06	105	80 - 120	101	80 - 120	<0.00010	mg/L	NC	20
8063995	Dissolved Zirconium (Zr)	2015/10/06					<0.00010	mg/L	NC	20
8064011	Dissolved Aluminum (Al)	2015/10/07	97	80 - 120	103	80 - 120	<0.00050	mg/L	2.9	20
8064011	Dissolved Antimony (Sb)	2015/10/07	NC	80 - 120	100	80 - 120	<0.000020	mg/L	1.3	20
8064011	Dissolved Arsenic (As)	2015/10/07	NC	80 - 120	100	80 - 120	<0.000020	mg/L	0.94	20

QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8064011	Dissolved Barium (Ba)	2015/10/07	NC	80 - 120	104	80 - 120	<0.000020	mg/L	3.5	20
8064011	Dissolved Beryllium (Be)	2015/10/07	92	80 - 120	100	80 - 120	<0.000010	mg/L	NC	20
8064011	Dissolved Bismuth (Bi)	2015/10/07	87	80 - 120	100	80 - 120	<0.0000050	mg/L	NC	20
8064011	Dissolved Boron (B)	2015/10/07					<0.010	mg/L	NC	20
8064011	Dissolved Cadmium (Cd)	2015/10/07	90	80 - 120	102	80 - 120	<0.0000050	mg/L	4.0	20
8064011	Dissolved Chromium (Cr)	2015/10/07	87	80 - 120	102	80 - 120	<0.00010	mg/L	NC	20
8064011	Dissolved Cobalt (Co)	2015/10/07	NC	80 - 120	107	80 - 120	<0.0000050	mg/L	1.8	20
8064011	Dissolved Copper (Cu)	2015/10/07	81	80 - 120	102	80 - 120	<0.000050	mg/L	3.0	20
8064011	Dissolved Iron (Fe)	2015/10/07	97	80 - 120	103	80 - 120	<0.0010	mg/L	0.018	20
8064011	Dissolved Lead (Pb)	2015/10/07	91	80 - 120	104	80 - 120	<0.0000050	mg/L	NC	20
8064011	Dissolved Lithium (Li)	2015/10/07	90	80 - 120	101	80 - 120	<0.00050	mg/L	9.8	20
8064011	Dissolved Manganese (Mn)	2015/10/07	NC	80 - 120	101	80 - 120	<0.000050	mg/L	1.3	20
8064011	Dissolved Molybdenum (Mo)	2015/10/07	NC	80 - 120	98	80 - 120	<0.000050	mg/L	1.8	20
8064011	Dissolved Nickel (Ni)	2015/10/07	78 (1)	80 - 120	101	80 - 120	<0.000020	mg/L	1.2	20
8064011	Dissolved Phosphorus (P)	2015/10/07					<0.0020	mg/L	NC	20
8064011	Dissolved Selenium (Se)	2015/10/07	NC	80 - 120	96	80 - 120	<0.000040	mg/L	0.25	20
8064011	Dissolved Silicon (Si)	2015/10/07					<0.050	mg/L	1.8	20
8064011	Dissolved Silver (Ag)	2015/10/07	89	80 - 120	92	80 - 120	<0.0000050	mg/L	NC	20
8064011	Dissolved Strontium (Sr)	2015/10/07	NC	80 - 120	99	80 - 120	<0.000050	mg/L	3.6	20
8064011	Dissolved Thallium (Tl)	2015/10/07	87	80 - 120	100	80 - 120	<0.0000020	mg/L	5.7	20
8064011	Dissolved Tin (Sn)	2015/10/07	98	80 - 120	97	80 - 120	<0.00020	mg/L	NC	20
8064011	Dissolved Titanium (Ti)	2015/10/07	88	80 - 120	101	80 - 120	<0.00050	mg/L	NC	20
8064011	Dissolved Uranium (U)	2015/10/07	NC	80 - 120	104	80 - 120	<0.0000020	mg/L	1.6	20
8064011	Dissolved Vanadium (V)	2015/10/07	90	80 - 120	100	80 - 120	<0.00020	mg/L	NC	20
8064011	Dissolved Zinc (Zn)	2015/10/07	84	80 - 120	103	80 - 120	<0.00010	mg/L	0.36	20
8064011	Dissolved Zirconium (Zr)	2015/10/07					<0.00010	mg/L	NC	20
8064153	Total Aluminum (Al)	2015/10/07	NC	80 - 120	111	80 - 120	<0.0030	mg/L		
8064153	Total Antimony (Sb)	2015/10/07	104	80 - 120	100	80 - 120	<0.000050	mg/L		
8064153	Total Arsenic (As)	2015/10/07	107	80 - 120	98	80 - 120	<0.000020	mg/L		
8064153	Total Barium (Ba)	2015/10/07	NC	80 - 120	107	80 - 120	<0.00010	mg/L		
8064153	Total Beryllium (Be)	2015/10/07	99	80 - 120	97	80 - 120	<0.000010	mg/L		
8064153	Total Bismuth (Bi)	2015/10/07	101	80 - 120	98	80 - 120	<0.000020	mg/L	NC	20

Maxxam Job #: B587453
Report Date: 2015/10/13

QUALITY ASSURANCE REPORT(CONT'D)

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8064153	Total Boron (B)	2015/10/07					<0.050	mg/L		
8064153	Total Cadmium (Cd)	2015/10/07	96	80 - 120	99	80 - 120	<0.0000050	mg/L		
8064153	Total Chromium (Cr)	2015/10/07	NC	80 - 120	102	80 - 120	<0.00050	mg/L		
8064153	Total Cobalt (Co)	2015/10/07	103	80 - 120	107	80 - 120	<0.000010	mg/L		
8064153	Total Copper (Cu)	2015/10/07	89	80 - 120	104	80 - 120	<0.00020	mg/L		
8064153	Total Iron (Fe)	2015/10/07	NC	80 - 120	108	80 - 120	<0.0050	mg/L		
8064153	Total Lead (Pb)	2015/10/07	108	80 - 120	102	80 - 120	<0.000050	mg/L		
8064153	Total Lithium (Li)	2015/10/07	NC	80 - 120	99	80 - 120	<0.00050	mg/L		
8064153	Total Manganese (Mn)	2015/10/07	NC	80 - 120	102	80 - 120	<0.00010	mg/L		
8064153	Total Molybdenum (Mo)	2015/10/07	NC	80 - 120	99	80 - 120	<0.000050	mg/L		
8064153	Total Nickel (Ni)	2015/10/07	NC	80 - 120	100	80 - 120	<0.00010	mg/L		
8064153	Total Phosphorus (P)	2015/10/07					<0.010	mg/L		
8064153	Total Selenium (Se)	2015/10/07	NC	80 - 120	91	80 - 120	<0.000040	mg/L		
8064153	Total Silicon (Si)	2015/10/07					<0.10	mg/L		
8064153	Total Silver (Ag)	2015/10/07	86	80 - 120	100	80 - 120	<0.0000050	mg/L		
8064153	Total Strontium (Sr)	2015/10/07	NC	80 - 120	100	80 - 120	<0.000050	mg/L		
8064153	Total Thallium (Tl)	2015/10/07	98	80 - 120	98	80 - 120	<0.0000020	mg/L		
8064153	Total Tin (Sn)	2015/10/07	114	80 - 120	100	80 - 120	<0.00020	mg/L		
8064153	Total Titanium (Ti)	2015/10/07	101	80 - 120	101	80 - 120	<0.0050	mg/L		
8064153	Total Uranium (U)	2015/10/07	NC	80 - 120	102	80 - 120	<0.0000050	mg/L		
8064153	Total Vanadium (V)	2015/10/07	NC	80 - 120	102	80 - 120	<0.00050	mg/L		
8064153	Total Zinc (Zn)	2015/10/07	96	80 - 120	101	80 - 120	<0.0010	mg/L		
8064153	Total Zirconium (Zr)	2015/10/07					<0.00010	mg/L		
8064276	Dissolved Chloride (Cl)	2015/10/06	94	80 - 120	100	80 - 120	<0.50	mg/L	NC	20
8064280	Dissolved Sulphate (SO4)	2015/10/06	NC	80 - 120	89	80 - 120	0.75, RDL=0.50	mg/L	2.1	20
8064297	Dissolved Chloride (Cl)	2015/10/06	NC	80 - 120	95	80 - 120	<0.50	mg/L	0.075	20
8064299	Dissolved Sulphate (SO4)	2015/10/06	NC	80 - 120	88	80 - 120	0.84, RDL=0.50	mg/L	0.32	20
8064498	Strong Acid Dissoc. Cyanide (CN)	2015/10/06	99	80 - 120	97	80 - 120	<0.00050	mg/L	NC	20
8064499	Weak Acid Dissoc. Cyanide (CN)	2015/10/06	103	80 - 120	95	80 - 120	<0.00050	mg/L	NC	20
8064551	Nitrate plus Nitrite (N)	2015/10/06	99	80 - 120	106	80 - 120	<0.0020	mg/L	NC	25
8064552	Nitrite (N)	2015/10/06	104	80 - 120	110	80 - 120	<0.0020	mg/L	NC	25
8064553	Nitrate plus Nitrite (N)	2015/10/06	105	80 - 120	100	80 - 120	<0.0020	mg/L	3.7	25

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8064554	Nitrite (N)	2015/10/06	104	80 - 120	107	80 - 120	<0.0020	mg/L	NC	25
8064871	Dissolved Chloride (Cl)	2015/10/06	111	80 - 120	103	80 - 120	<0.50	mg/L	NC	20
8064872	Dissolved Sulphate (SO4)	2015/10/06	NC	80 - 120	98	80 - 120	0.51, RDL=0.50	mg/L	1.5	20
8065187	Total Suspended Solids	2015/10/07			100	80 - 120	<1.0	mg/L		
8065423	Total Mercury (Hg)	2015/10/07	95	80 - 120	103	80 - 120	<0.0000020	mg/L	NC	20
8065639	Strong Acid Dissoc. Cyanide (CN)	2015/10/07	96	80 - 120	97	80 - 120	<0.00050	mg/L	NC	20
8065644	Dissolved Mercury (Hg)	2015/10/07	102	80 - 120	96	80 - 120	0.0000027, RDL=0.0000020	mg/L	NC	20
8065645	Weak Acid Dissoc. Cyanide (CN)	2015/10/07	98	80 - 120	97	80 - 120	<0.00050	mg/L	NC	20
8065730	Alkalinity (PP as CaCO3)	2015/10/07					<0.50	mg/L	NC	20
8065730	Alkalinity (Total as CaCO3)	2015/10/07	NC	80 - 120	93	80 - 120	<0.50	mg/L	9.6	20
8065730	Bicarbonate (HCO3)	2015/10/07					<0.50	mg/L	9.6	20
8065730	Carbonate (CO3)	2015/10/07					<0.50	mg/L	NC	20
8065730	Hydroxide (OH)	2015/10/07					<0.50	mg/L	NC	20
8065734	Conductivity	2015/10/07			99	80 - 120	<1.0	uS/cm	8.0	20
8065736	pH	2015/10/07			102	97 - 103			0	N/A
8065739	Dissolved Mercury (Hg)	2015/10/07	83	80 - 120	95	80 - 120	<0.0000020	mg/L	NC	20
8065742	Alkalinity (PP as CaCO3)	2015/10/07					<0.50	mg/L	NC	20
8065742	Alkalinity (Total as CaCO3)	2015/10/07	NC	80 - 120	98	80 - 120	<0.50	mg/L	0.48	20
8065742	Bicarbonate (HCO3)	2015/10/07					<0.50	mg/L	0.48	20
8065742	Carbonate (CO3)	2015/10/07					<0.50	mg/L	NC	20
8065742	Hydroxide (OH)	2015/10/07					<0.50	mg/L	NC	20
8065745	Conductivity	2015/10/07			100	80 - 120	<1.0	uS/cm	2.2	20
8065747	pH	2015/10/07			102	97 - 103			0.56	N/A
8065781	Dissolved Sulphate (SO4)	2015/10/07			96	80 - 120	<0.50	mg/L		
8065943	Total Ammonia (N)	2015/10/07	103	80 - 120	105	80 - 120	<0.0050	mg/L	NC	20
8065944	Total Ammonia (N)	2015/10/07	100	80 - 120	114	80 - 120	<0.0050	mg/L	NC	20
8065946	Total Ammonia (N)	2015/10/07	NC	80 - 120	107	80 - 120	<0.0050	mg/L	1.9	20
8065951	Total Ammonia (N)	2015/10/07	97	80 - 120	106	80 - 120	<0.0050	mg/L	NC	20
8067102	Total Dissolved Solids	2015/10/10	NC	80 - 120	98	80 - 120	<10	mg/L	NC	20
8067593	Dissolved Selenium (Se)	2015/10/08			94	80 - 120	<0.000040	mg/L		
8067921	Nitrate plus Nitrite (N)	2015/10/08			98	80 - 120	<0.0020	mg/L		

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QUALITY ASSURANCE REPORT(CONT'D)

			Matrix Spike		Spiked Blank		Method Blank		RPD	
QC Batch	Parameter	Date	% Recovery	QC Limits	% Recovery	QC Limits	Value	UNITS	Value (%)	QC Limits
8069692	Dissolved Chloride (Cl)	2015/10/09			102	80 - 120	<0.50	mg/L		
8069702	Dissolved Sulphate (SO4)	2015/10/09			95	80 - 120	0.51, RDL=0.50	mg/L		

N/A = Not Applicable

Duplicate: Paired analysis of a separate portion of the same sample. Used to evaluate the variance in the measurement.

Matrix Spike: A sample to which a known amount of the analyte of interest has been added. Used to evaluate sample matrix interference.

Spiked Blank: A blank matrix sample to which a known amount of the analyte, usually from a second source, has been added. Used to evaluate method accuracy.

Method Blank: A blank matrix containing all reagents used in the analytical procedure. Used to identify laboratory contamination.

NC (Matrix Spike): The recovery in the matrix spike was not calculated. The relative difference between the concentration in the parent sample and the spiked amount was too small to permit a reliable recovery calculation (matrix spike concentration was less than 2x that of the native sample concentration).

NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (one or both samples < 5x RDL).

(1) Recovery or RPD for this parameter is outside control limits. The overall quality control for this analysis meets acceptability criteria.

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Maxxam Job #: B587453
Report Date: 2015/10/13

Alexco Environmental Group Inc.
Client Project #: GPBC-13-01

VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by the following individual(s).

David Huang, BBY Scientific Specialist

Maxxam has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per section 5.10.2 of ISO/IEC 17025:2005(E), signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

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Maxxam Analytics Inc

4606 Canada Way
Burnaby, BC V5G 1K5
www.maxxam.ca

Phone: (604) 734- 7276
Fax.: (604) 630-0110
Toll-Free: 1-800-665-8566

CHAIN-OF CUSTODY RECORD AND ANALYSIS REQUEST

PAGE 1 OF 5

LAB USE ONLY
MAXXAM JOB #: B587453

ANALYSIS REQUEST

LAB USE ONLY
COC #: 08412388

COMPANY NAME: #3429 ACCESS CONSULTING GROUP

CLIENT PROJECT NO.: GPBC-13-01

COMPANY ADDRESS: #3 Calcite Business Centre, 151 Industrial Road, Whitehorse, YT, Y1A 2V3

TEL.: (867)668-6463
E-MAIL: abier@accessconsulting.ca, cherry@accessconsulting.ca, mducharme@accessconsulting.ca,
FAX: (867)667-6680

SAMPLER NAME (PRINT): A. Brer / C. Henry

PROJECT MANAGER: David Petkovich

LABORATORY CONTACT: Morgan Melnychuk

	FIELD SAMPLE ID	MAXXAM LAB # (LAB USE ONLY)	MATRIX: GROUNDWATER	SURFACE WATER	DRINKING WATER	SOIL	OTHER	SAMPLING: DATE DD/MM/YY	TIME	# CONTAINERS	Low-Level Total Metals (incl. Hg)	Low-level Dissolved Metals (incl. Hg)	General (pH, cond., alk., hard)	Anions (chloride, sulfate, nitrate)	TDS/TSS (Low-level)	Cyanide (SAD(total) & WAD)	Ammonina-N
1	BC-1	NH5782		x				29/9/2015	11:00	10	x	x	x	x	x	x	x
2	BC-2	NH5783		x				29/9/2015	14:10	10	x	x	x	x	x	x	x
3	BC-6	NH5784		x				29/9/2015	9:15	10	x	x	x	x	x	x	x
4	BC-31	NH5785		x				29/9/2015	11:55	10	x	x	x	x	x	x	x
5	BC-34	NH5786		x				29/9/2015	15:35	10	x	x	x	x	x	x	x
6	BC-39	NH5787		x				29/9/2015	9:36	10	x	x	x	x	x	x	x
7	BC-51W	NH5788		x				30/9/2015	16.45	10	x	x	x	x	x	x	x
8	BC-53	NH5789		x				29/9/2015	10:15	10	x	x	x	x	x	x	x
9	[redacted] BC-B	NH5790		x				—	—	10	x	x	x	x	x	x	x
10	[redacted] BC-A	NH5791		x				—	—	10	x	x	x	x	x	x	x
11	Trip Blank	NH5792		X				—	—	10	X	X	X	X	X	X	X
12																	

B587453

TAT (Turnaround Time)
LESS THAN 5 DAY TAT MUST HAVE PRIOR APPROVAL
* Some exceptions apply - please contact laboratory
STANDARD 5 BUSINESS DAYS
RUSH 3 BUSINESS DAYS
RUSH 2 BUSINESS DAYS
URGENT 1 BUSINESS DAY
OTHER BUSINESS DAYS

PO NUMBER OR QUOTE NUMBER:

SPECIAL DETECTION LIMITS / CONTAMINANT TYPE:

ACCOUNTING CONTACT: Kirstin Chislett

SPECIAL REPORTING OR BILLING INSTRUCTIONS:

CCME
CSR
AB TIER 1
OTHER
JARS USED:

LAB USE ONLY
ARRIVAL TEMPERATURE °C: 6,4,3/5,5,2 2,3,5/5,7,5/2,3,4 4,3,4/3,4,4
DUE DATE:
LOG IN CHECK:

	DATE DD/MM/YY	TIME	
RELINQUISHED BY SAMPLER: C. Henry	2/10/2015	16:00	RECEIVED BY:
RELINQUISHED BY:	DATE DD/MM/YY	TIME	RECEIVED BY:
RELINQUISHED BY:	DATE DD/MM/YY 2015/10/05	TIME 11:00	RECEIVED BY LABORATORY: OLIVER P. SMITH

CUSTODY RECORD

COCFORM - BC - 30070922

Maxxam Analytics Inc

4606 Canada Way
Burnaby, BC V5G 1K5
www.maxxam.ca

Phone: (604) 734- 7276
Fax: (604) 630-0110
Toll-Free: 1-800-665-8566

CHAIN-OF CUSTODY RECORD AND ANALYSIS REQUEST

LAB USE ONLY
MAXXAM JOB #: B587453

ANALYSIS REQUEST

LAB USE ONLY
COC #: 08412389

LAB USE ONLY

COMPANY NAME:	#3429 ACCESS CONSULTING GROUP
COMPANY ADDRESS:	#3 Calcite Business Centre 151 Industrial Road Whitehorse, YT Y1A 2V3
CLIENT PROJECT NO.:	GPBC-13-01
TEL.:	(867)668-6463
E-MAIL:	abier@accessconsulting.ca, chenry@accessconsulting.ca mducharme@accessconsulting.ca,
FAX:	(867)667-6680
SAMPLER NAME (PRINT):	A.Bier / C.Henry
PROJECT MANAGER:	David Petkovich
LABORATORY CONTACT:	Morgan Melnychuk

	FIELD SAMPLE ID	MAXXAM LAB # (LAB USE ONLY)	MATRIX: GROUNDWATER	SURFACE WATER	DRINKING WATER	SOIL	OTHER	SAMPLING: DATE DD/MM/YY	TIME	# CONTAINERS	Low-Level Dissolved Metals (incl. Hg)	General (Alk, EC, pH)	Anions (chloride, sulfate, nitrate)	TDS	Cyanide (SAD/total) & WAD)	Ammonina-N
1	BC-19	NH5799	x					1/10/2015	14:45	6	x	x	x	x	x	x
2	BC-21	NH5800	x					30/9/2015	16:44	6	x	x	x	x	x	x
3	BC-22	NH5801	x					1/10/2015	16:43	6	x	x	x	x	x	x
4	BC-27	NH5802	x					30/9/2015	11:15	6	x	x	x	x	x	x
5	BC-65	NH5803	x					1/10/2015	13:58	6	x	x	x	x	x	x
6	BC-66	NH5804	x					1/10/2015	12:05	6	x	x	x	x	x	x
7	BC-67	NH5805	x					30/9/2015	13:05	6	x	x	x	x	x	x
8	~~BC-68~~	—						—	—							
9	BC-69	NH5806	x					30/9/2015	14:12	6	x	x	x	x	x	x
10	~~Dup2~~ BC-C	NH5807	x					—	—	6	x	x	x	x	x	x
11																
12																

B587453

TAT (Turnaround Time)
LESS THAN 5 DAY TAT MUST HAVE PRIOR APPROVAL
* Some exceptions apply - please contact laboratory

STANDARD	5 BUSINESS DAYS
RUSH	3 BUSINESS DAYS
RUSH	2 BUSINESS DAYS
URGENT	1 BUSINESS DAY

OTHER BUSINESS DAYS

CUSTODY RECORD

PO NUMBER OR QUOTE NUMBER:

SPECIAL DETECTION LIMITS / CONTAMINANT TYPE:

CCME
CSR
AB TIER 1
OTHER

LAB USE ONLY
ARRIVAL TEMPERATURE °C: 6,4,3/5,5,2/2,3,5 5,7,5/2,3,4/4,3,4 3,7,4
DUE DATE:
LOG IN CHECK:

ACCOUNTING CONTACT: Kirstin Chislett

SPECIAL REPORTING OR BILLING INSTRUCTIONS:

JARS USED:

RELINQUISHED BY SAMPLER: C.Henry	DATE: DD/MM/YY 2/10/2015	TIME: 16:00	RECEIVED BY:
RELINQUISHED BY:	DATE: DD/MM/YY	TIME:	RECEIVED BY:
RELINQUISHED BY:	DATE: DD/MM/YY 2015/10/05	TIME: 11:00	RECEIVED BY LABORATORY: OLIVER P-SMITH

COCFORM - BC - 3037082

Maxxam Analytics Inc
4606 Canada Way
Burnaby, BC V5G 1K5
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Fax.: (604) 630-0110
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CHAIN-OF CUSTODY RECORD AND ANALYSIS REQUEST

LAB USE ONLY
MAXXAM JOB #: B587453

ANALYSIS REQUEST

LAB USE ONLY
COC #: 08412390

COMPANY NAME:	#3429 ACCESS CONSULTING GROUP
COMPANY ADDRESS:	#3 Calcite Business Centre 151 Industrial Road Whitehorse, YT Y1A 2V3
CLIENT PROJECT NO.:	GPBC-13-01
TEL:	(867)668-6463
E-MAIL:	abier@accessconsulting.ca, chenry@accessconsulting.ca mducharme@accessconsulting.ca,
FAX:	(867)667-6680
SAMPLER NAME (PRINT):	A.Bier / C.Henry
PROJECT MANAGER:	David Petkovich
LABORATORY CONTACT:	Morgan Melnychuk

	FIELD SAMPLE ID	MAXXAM LAB # (LAB USE ONLY)	MATRIX: GROUNDWATER	SURFACE WATER	DRINKING WATER	SOIL	OTHER	SAMPLING: DATE DD/MM/YY	TIME	# CONTAINERS	Low-Level Total Metals (incl. Hg)	Low-level Dissolved Metals (incl. Hg)	General (Alk, EC, pH)	Anions (sulfate, nitrate)	TDS/TSS (Low-level)	Ammonina-N
1	BC-10	NH5814		x				30/9/2015	12:01	9	x	x	x	x	x	x
2	~~BC-11~~			~~x~~							~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~
3	BC-12	NH5815		x				30/9/2015	14:41	9	x	x	x	x	x	x
4	BC-15	NH5816		x				30/9/2015	15:15	9	x	x	x	x	x	x
5	~~BC-16~~			~~x~~							~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~
6	BC-17	NH5817		x				30/9/2015	11:45	9	x	x	x	x	x	x
7	~~BC-18N~~			~~x~~							~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~
8	~~BC-18S~~			~~x~~							~~x~~	~~x~~	~~x~~	~~x~~	~~x~~	~~x~~
9																
10																
11																
12																

B587453

TAT (Turnaround Time)
LESS THAN 5 DAY TAT MUST HAVE PRIOR APPROVAL
* Some exceptions apply - please contact laboratory
STANDARD 5 BUSINESS DAYS
RUSH 3 BUSINESS DAYS
RUSH 2 BUSINESS DAYS
URGENT 1 BUSINESS DAY
OTHER BUSINESS DAYS

PO NUMBER OR QUOTE NUMBER:

SPECIAL DETECTION LIMITS / CONTAMINANT TYPE:

ACCOUNTING CONTACT: Kirstin Chislett

SPECIAL REPORTING OR BILLING INSTRUCTIONS:

CCME
CSR
AB TIER 1
OTHER
JARS USED:

LAB USE ONLY
ARRIVAL TEMPERATURE °C: 6,4,3/5,5,2/2,3,5 5,7,5/2,3,4/4,3,4
DUE DATE:
LOG IN CHECK:

RELINQUISHED BY SAMPLER: C. Henry	DATE: DD/MM/YY 2/10/2015	TIME: 16:00	RECEIVED BY:
RELINQUISHED BY:	DATE: DD/MM/YY	TIME:	RECEIVED BY:
RELINQUISHED BY:	DATE: DD/MM/YY: 2015/10/05	TIME: 11:00	RECEIVED BY LABORATORY: OLIVER P. SMITH

CUSTODY RECORD

COCFORM - BC - 20070522

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4606 Canada Way
Burnaby, BC V5G 1K5
www.maxxam.ca

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Fax.: (604) 630-0110
Toll-Free: 1-800-665-8566

CHAIN-OF CUSTODY RECORD AND ANALYSIS REQUEST

LAB USE ONLY
MAXXAM JOB #: B587453

ANALYSIS REQUEST

LAB USE ONLY
COC #: 08412391

LAB USE ONLY

COMPANY NAME:	#3429 ACCESS CONSULTING GROUP
CLIENT PROJECT NO.:	GPBC-13-01
COMPANY ADDRESS:	#3 Calcite Business Centre 151 Industrial Road Whitehorse, YT Y1A 2V3
TEL.:	(867)668-6463
E-MAIL:	abier@accessconsulting.ca, chenry@accessconsulting.ca mducharme@accessconsulting.ca,
FAX:	(867)667-6680
SAMPLER NAME (PRINT):	A. Bier / C. Henry
PROJECT MANAGER:	David Petkovich
LABORATORY CONTACT:	Morgan Melnychuk

	FIELD SAMPLE ID	MAXXAM LAB # (LAB USE ONLY)	MATRIX: GROUNDWATER	SURFACE WATER	DRINKING WATER	SOIL	OTHER	SAMPLING: DATE DD/MM/YY	TIME	# CONTAINERS	Low-Level Total Metals (incl. Hg)	Low-level Dissolved Metals (incl. Hg)	General (pH, cond., alk., hard)	Anions (chloride, sulfate, nitrate)	TSS (Low-level)	TDS	Ammonia-N
1	BC-3	NHS829		x				29/9/2015	13:32	9	x	x	x	x	x	x	x
2	BC-4	NHS830		x				29/9/2015	12:52	9	x	x	x	x	x	x	x
3	BC-5	NHS831		x				29/9/2015	14:52	9	x	x	x	x	x	x	x
4	~~DC-70~~			~~x~~							x	~~x~~	x	x	~~x~~	~~x~~	x
5																	
6																	
7																	
8																	
9																	
10																	
11																	
12																	

B587453

TAT (Turnaround Time)
LESS THAN 5 DAY TAT MUST HAVE PRIOR APPROVAL
* Some exceptions apply - please contact laboratory
STANDARD 5 BUSINESS DAYS
RUSH 3 BUSINESS DAYS
RUSH 2 BUSINESS DAYS
URGENT 1 BUSINESS DAY
OTHER BUSINESS DAYS

PO NUMBER OR QUOTE NUMBER:

SPECIAL DETECTION LIMITS / CONTAMINANT TYPE:

CCME
CSR
AB TIER 1
OTHER

LAB USE ONLY
ARRIVAL TEMPERATURE °C: 6,4,3/5,5,2/2,3,5 5,7,5/2,3,4/4,3,4 3,4,4
DUE DATE:
LOG IN CHECK:

ACCOUNTING CONTACT: Kirstin Chislett

SPECIAL REPORTING OR BILLING INSTRUCTIONS:

JARS USED:

RELINQUISHED BY SAMPLER: C. Henry	DATE: DD/MM/YY 2/10/2015	TIME: 16:00	RECEIVED BY:
RELINQUISHED BY:	DATE: DD/MM/YY	TIME:	RECEIVED BY:
RELINQUISHED BY:	DATE: DD/MM/YY 2015/10/05	TIME: 11:00	RECEIVED BY LABORATORY: OLIVER P. SMITH

CUSTODY RECORD

COCFORM - BC - 20070622

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4606 Canada Way
Burnaby, BC V5G 1K5
www.maxxam.ca

Phone: (604) 734- 7276
Fax.: (604) 630-0110
Toll-Free: 1-800-665-8566

CHAIN-OF CUSTODY RECORD AND ANALYSIS REQUEST

PAGE 5 OF 5

LAB USE ONLY
MAXXAM JOB # B587453

ANALYSIS REQUEST

LAB USE ONLY
COC #
08412392

COMPANY NAME: #3429 ACCESS CONSULTING GROUP

CLIENT PROJECT NO.: GPBC-13-01

COMPANY ADDRESS:
#3 Calcite Business Centre
151 Industrial Road
Whitehorse, YT
Y1A 2V3

TEL: (867)668-6463
E-MAIL: abier@accessconsulting.ca; chenry@accessconsulting.ca; mduchamey@accessconsulting.ca;
FAX: (867)667-6680

SAMPLER NAME (PRINT): A.Bier / C.Henry

PROJECT MANAGER: David Petkovich

LABORATORY CONTACT: Morgan Melnychuk

	FIELD SAMPLE ID	MAXXAM LAB # (LAB USE ONLY)	MATRIX: GROUNDWATER	SURFACE WATER	DRINKING WATER	SOIL	OTHER	SAMPLING: DATE DD/MM/YY	TIME	# CONTAINERS	Low-Level Total Metals (incl. Hg)	Low-level Dissolved Metals (incl. Hg)	Ammonina-N	Cyanide (SAD/total) & WAD)	TSS (Low-level)
1	BC-28	NH5832		x				1/10/2015	16:26	9	x	x	x	x	x
2	BC-28a	NH5833		x				1/10/2015	15:47	9	x	x	x	x	x
3	BC-28b	NH5834		x				1/10/2015	16:05	9	x	x	x	x	x
4															
5															
6															
7															
8															
9															
10															
11															
12															

B587453

TAT (Turnaround Time)
LESS THAN 5 DAY TAT MUST HAVE PRIOR APPROVAL
* Some exceptions apply - please contact laboratory
STANDARD 5 BUSINESS DAYS
RUSH 3 BUSINESS DAYS
RUSH 2 BUSINESS DAYS
URGENT 1 BUSINESS DAY
OTHER BUSINESS DAYS

PO NUMBER OR QUOTE NUMBER:

ACCOUNTING CONTACT: Kirstin Chislett

SPECIAL DETECTION LIMITS / CONTAMINANT TYPE:

SPECIAL REPORTING OR BILLING INSTRUCTIONS:

CCME
CSR
AB TIER 1
OTHER
JARS USED:

LAB USE ONLY
ARRIVAL TEMPERATURE °C: 6,4,3/5,5,2/2,3,5 5,7,5/2,3,4/4,3,4 4,4,3
DUE DATE:
LOG IN CHECK:

RELINQUISHED BY SAMPLER: C.Henry	DATE: DD/MM/YY 2/10/2015	TIME: 16:00	RECEIVED BY:
RELINQUISHED BY:	DATE: DD/MM/YY	TIME:	RECEIVED BY:
RELINQUISHED BY:	DATE: DD/MM/YY 2015/10/05	TIME: 11:00	RECEIVED BY LABORATORY: OLIVER P. SMITH

CUSTODY RECORD

COCFORM - BC - 20070822

APPENDIX D

FIELD REPORTS

3 Calcite Business Centre, 151 Industrial Road
Whitehorse, Yukon Y1A 2V3
Phone (867) 668-6463 Fax (867) 633-4882
www.accessconsulting.ca

Memorandum

To: Yukon Water Board

From: Anthony Bier, Access Consulting Group

CC: Janet Lee Sheriff, Golden Predator

Date: October 28, 2015

Re: Brewery Creek QZ96-007 WUL Compliance Environmental Data Collection, October 2015

1 INTRODUCTION

This letter report describes the field work conducted for Golden Predator Canada Corp. (GPCC) at the Brewery Creek Property by Alexco Environmental Group (AEG) (DBA Access Consulting (Access) in Yukon) from September 28th to Oct 2nd, 2015, as required under Schedule B-3 of Water Licence QZ96-007, Amendment 8.

Access employees Anthony Bier and Catherine Henry deployed from Whitehorse to Brewery Creek on September 28th by truck with ATVs for on site access. Trans North Helicopters were chartered from Dawson on September 29th to access remote sites. The objective of this trip was to complete water quality and discharge, or level monitoring, as required under WUL QZ96-007, Amendment 8 Shedule B-3.

Water quality samples, in-situ observations, discharge measurements and level observations were completed over three days from September 29th to October 1st, 2015 and AEG personnel returned to Whitehorse on October 2nd, 2015.

2 SURFACE WATER QUALITY AND HYDROLOGY

During the 2015 annual sampling event the following surface water sites listed in Schedule B-3 of WUL QZ96-007 Amendment 8 were visited and sampled accordingly: BC-1, BC-2, BC-3, BC-4, BC-5, BC-6, BC-31, BC-34, BC-39 and BC-53. Water level and discharge were slightly higher than usual at this time of year. There was no channel ice at any sites and only trace amounts of snow at higher elevations.

Samples were stored in coolers with ice packs prior to shipping to Maxxam Analytics Inc. No samples were field filtered and only samples for cyanide were preserved in the field. Samples were analyzed for the following parameters:

- Routine parameters (conductivity, pH, alkalinity, hardness, hydroxide, carbonate);
- Total suspended and dissolved solids (TSS/TDS);
- Ammonia;
- Anions (nitrite, nitrate, fluoride, sulphate, chloride, bromide, ortho-phosphate);
- Cyanide (Weak Acid Dissociable and Total) where applicable; and
- Total and dissolved metals (suite of 33 metals, including all parameters found in the CCME and MMER guidelines).

QA/QC samples were collected or prepared as follows:

- Field duplicates – A set of duplicate samples (full suite of parameters) was collected at station BC-31 and labeled "BC-A". Samples were collected simultaneously with BC-31 samples.
- Field blanks – A set of field blanks were processed at station BC-51W and labelled "BC-B". The DI water batch # was 092115-0921.
- Trip blank – Trip blanks provided by Maxxam were carried throughout the trip and were not opened. The trip blank batch # was B577609.

Lab results from Maxxam Analytics are contained in a separate spreadsheet provided to the Water Board submitted via Waterline titled "Brewery Creek 2015 Annual Results".

2.1 IN-SITU WATER QUALITY DATA

In-situ field measurements were collected using a YSI multimeter that was calibrated prior to the trip. Table 1 presents those results.

Table 1 Baseline Surface In Situ Data

Station	Date	Time	Temp (ºC)	DO (%)	DO (mg/L)	SPC (µS/cm)	pH	ORP (mV)	Comments
BC-1	29-Sep-15	11:02	1.6	99	12.6	368.3	8.06	266	
BC-2	29-Sep-15	14:10	1.9	96	12	367.8	7.84	246.2	
BC-3	29-Sep-15	13:37	1.7	97	12.1	379.7	8.03	245.3	
BC-4	29-Sep-15	12:52	1.2	95	11.9	534.4	7.75	206.3	
BC-5	29-Sep-15	14:51	1.2	97	12.4	404.9	7.96	268.1	
BC-6	29-Sep-15	9:15	3.4	96	11.7	274	7.81	220	
BC-31	29-Sep-15	11:55	1.2	99	12.6	429.8	8.16	277.6	
BC-34	29-Sep-15	15:37	2.9	96	11.8	400.7	8.1	291	
BC-39	29-Sep-15	9:37	4.5	67	8.0	252.2	7.48	206.2	
BC-53	29-Sep-15	10:16	1.6	100	12.7	363.4	7.97	251.8	

2.2 HYDROMETRIC DATA

The traditional velocity-area method was used for discharge measurements at all stations, utilizing a Hach FH 950 electromagnetic velocity meter. Staff gauge observations (where applicable) are the median number between the start and end of the discharge measurement.

Discharge measurements conducted at surface water sites during the trip are presented in Table 2.

Table 2 Discharge Measurements

Station	Date	Time	Staff Gauge (m)	Discharge (m^3/sec)	RPD (%)	Method
BC-1	29-Sep-15	11:18	0.624	0.2106	1.4	Hach
BC-2	29-Sep-15	14:20	n/a	0.0207	7.2	Hach
BC-3	29-Sep-15	13:47	n/a	0.1713	0.6	Hach
BC-4	29-Sep-15	13:01	n/a	0.0568	n/a	Hach
BC-5	29-Sep-15	15:06	0.323	0.2248	1.0	Hach
BC-31	29-Sep-15	12:12	0.597	1.1234	4.6	Hach
BC-34	29-Sep-15	16:00	n/a	3.4109	1.5	Hach
BC-39	29-Sep-15	9:42	n/a	0.0038	n/a	Hach
BC-53	29-Sep-15	10:31	n/a	0.2023	n/a	Hach

3 GROUNDWATER MONITORING

There are nine groundwater wells which require annual sampling under QZ96-007, of which eight were sampled successfully. A Grundfos submersible pump supplied by Golden Predator with an EZ5000 Honda generator was used to obtain samples from the wells. Table 3 below outlines the conditions at each well, as well as the method of sampling and the purge volume.

Table 3 Baseline Groundwater well conditions, Sept/Oct 2015

Station	Date	Time	Depth to Water (m)	Total Depth (m)	Samples Collected (Y/N)	Volume Purged (L)	Method	Comments
BC-19	1-Oct-15	14:45	38.27	58.12	Y	120	Pump	
BC-21	30-Sep-15	16:50	33.15	81.0	Y	287	Pump	
BC-22	1-Oct-15	16:42	42.98	122.70	Y	~840	Pump	4" well
BC-27	30-Sep-15	11:18	8.31	17.77	Y	60	Pump	
BC-65	1-Oct-15	13:57	30.39	66.00	Y	120	Pump	Very slow recharge
BC-66	1-Oct-15	12:08	47.85	67.1	Y	116	Pump	

Station	Date	Time	Depth to Water (m)	Total Depth (m)	Samples Collected (Y/N)	Volume Purged (L)	Method	Comments
BC-67	30-Sep-15	13:05	39.79	51.91	Y	75	Pump	
BC-68	30-Sep-15	13:22	60.88	76.9	N	0	n/a	Obstruction ~12.5m
BC-69	30-Sep-15	14:12	36.47	42.05	Y	34	Pump	

All water samples were collected raw, except cyanide samples which were preserved in the field, and kept cool with ice packs prior to shipping to Maxxam Analytics Inc. Samples were analyzed for the following parameters:

- Routine parameters (conductivity, pH, alkalinity, hardness, hydroxide, carbonate);
- Total suspended and dissolved solids;
- Ammonia;
- Anions (nitrite, nitrate, fluoride, sulphate, chloride, bromide, ortho-phosphate);
- Cyanide (Weak Acid Dissociable and Total); and
- Dissolved metals (suite of 33 metals, at low level detection limits).

QA/QC samples were collected or prepared as follows:

- Field duplicates – A set of duplicate samples (full suite of parameters) was collected at station BC-21 and labeled "BC-C". Samples were collected concurrent to BC-21 samples.

Lab results from Maxxam Analytics are contained in a separate spreadsheet provided to the Water Board submitted via Waterline titled "Brewery Creek 2015 Annual Results".

3.1 IN SITU DATA

In-situ field measurements were collected using a YSI multimeter that was calibrated prior to the trip. Data were obtained from a bucket while water was being pumped in after the desired purge volume was reached.

Table 4 Baseline Groundwater In Situ Data

Station	Date	Time	Temp (ºC)	DO (%)	DO (mg/L)	SPC (µS/cm)	pH	ORP (mV)
BC-19	1-Oct-15	14:45	2.3	25	3.2	1083	6.48	93.9
BC-21	30-Sep-15	16:50	3.1	26	3.1	1137	6.19	278.3
BC-22	1-Oct-15	16:42	2.1	23	2.9	1247	6.07	259.4
BC-27	30-Sep-15	11:18	4.1	5	0.6	763.5	7.76	41.7
BC-65	1-Oct-15	13:57	9	73	7.8	96.5	5.92	281.1
BC-66	1-Oct-15	12:08	3.1	11	1.3	667.2	7.75	119.9

Station	Date	Time	Temp (ºC)	DO (%)	DO (mg/L)	SPC (µS/cm)	pH	ORP (mV)
BC-67	30-Sep-15	13:05	4.2	16	1.9	368.7	6.66	119.9
BC-68	30-Sep-15	13:22	n/a	n/a	n/a	n/a	n/a	n/a
BC-69	30-Sep-15	14:12	4	13	1.5	727.3	7.07	195

4 COMPLIANCE MINE WATER MONITORING

There are twelve mine water related sites that require monitoring under QZ96-007 including pit water/discharge and effluent from the heap. Eight of those twelve sites had water present. Several are reclaimed areas that no longer have runoff or standing water. Those sites with "discharge" in their description tend to only have standing pit water. Finally, one additional site, BC-70 which is a shallow subsurface water lysimeter does not fit the surface or ground water definition. BC-70 was dry. It is not known why BC-70 fails to accumulate water, the above ground installation has been checked for obvious damage.

Some observations from sites visited:

- Lucky pit and dump sites, BC-18N and BC-18S, do not have water present. These sites have been reclaimed; BC-18N is a dry flat area and BC-18S is a grassy reclaimed hillslope with trees starting to fill in. These sites should be removed from the monitoring schedule.

- Pacific gulch, BC-16, is the overflow draining from Pacific pit. This channel is dry and appears to have been for some time. There is evidence of spring runoff eroding the road and flowing down this gulch during a short window of time, but this water would not be associated with Pacific Pit.

- BC-11, Blue Waste Dump, is a reclaimed waste rock storage area with a 0.5 meter soil cover with no signs of surface water running at any time of year, it is being rapidly reclaimed by trees.

- BC-28 was sampled at the waypoint for this site which is a culvert on the access road below Pond #3 (overflow pond). These waters are not coming from pond 3 but are surface and shallow subsurface runoff.

All water samples were collected raw, except cyanide samples which were preserved in the field, and kept cool with ice packs prior to shipping to Maxxam Analytics Inc. All sites were analyzed for the following parameters with the exception of anions, alklainity, routine, dissolved metals and TDS not being analysed for effluent sites:

- Routine parameters (conductivity, pH, alkalinity, hardness, hydroxide, carbonate);
- Total suspended and dissolved solids;
- Ammonia;
- Anions (nitrite, nitrate, fluoride, sulphate, chloride, bromide, ortho-phosphate); and
- Total and dissolved metals (suite of 33 metals, at low level detection limits).

QA/QC samples were collected or prepared as follows:

- See above QA/QC for surface and groundwater.

Lab results from Maxxam Analytics are contained in a separate spreadsheet provided to the Water Board submitted via Waterline titled "Brewery Creek 2015 Annual Results".

4.1 IN SITU DATA

In-situ field measurements were collected using a YSI multimeter that was calibrated prior to the trip. Table 5 presents these results.

Table 5 Compliance Surface and Mine-Realted Sites In Situ Data

Station	Date	Time	Temp (ºC)	DO (%)	DO (mg/L)	SPC (µS/cm)	pH	ORP (mV)	Comments
BC-10	30-Sep-15	11:59	3.4	87	10.1	425.4	8.39	129.6	
BC-12	30-Sep-15	14:42	4.3	66	7.7	923	7.35	180.5	
BC-15	30-Sep-15	15:15	4.1	79	9.1	891	8.08	200.9	
BC-17	30-Sep-15	11:46	2.3	92	11.1	362.8	7.94	95.2	
BC-28	1-Oct-15	16:29	2.8	90	11.3	109	7.84	224	
BC-28A	1-Oct-15	15:49	3.8	96	11.7	3448	7.89	213.4	Valve leaks slightly, but was purged for ~15 mins prior to sampling
BC-28B	1-Oct-15	16:08	4.7	89	10.6	2777	8.04	229.1	
BC-51W	30-Sep-15	16:45	4.7	85	9.8	696.3	3.84	340.2	

5 PHOTOGRAPHS

Photographs were taken throughout the trip and are located on the ACG server. Below is a selection of highlights. More photos are available upon request.

Photo 1: BC-1

Photo 2: BC-2, old weir

Photo 3: BC-6, downstream of Lee Creek, looking upstream

Photo 4: BC-33 , Looking upstream

Photo 5: BC-18N, Dry

Photo 6: BC-10 Kokanee Pit

Photo 7: BC-12, Blue Pit

Photo 8: BC-15, Moosehead Pit

Photo 9: BC-16, drainage to Pacific Gulch (Dry)

Photo 10: BC-39, looking upstream

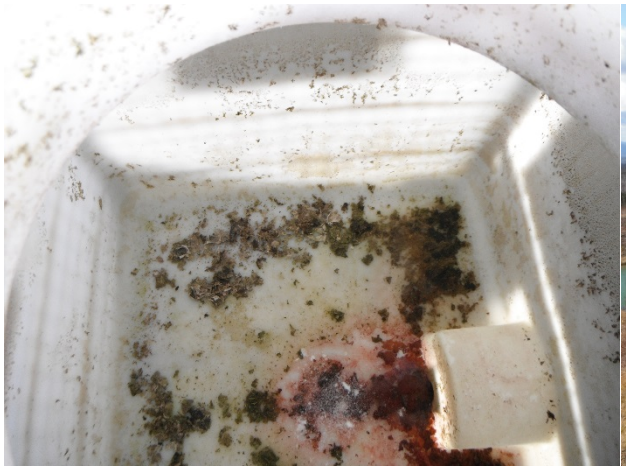

Photo 11: BC-70, empty Blue Lysimeter

Photo 12: Pond 3 (Overflow pond)