GOLDEN PREDATOR CORP.

Brewery Creek Mine

2012 ANNUAL WATER LICENSE REPORT

Submitted to the Yukon Water Board

Water Use License QZ96-007

2012 ANNUAL QUARTZ MINING LICENSE REPORT

Submitted to the Yukon Government, Energy Mines and Resources

Yukon Quartz Mining License A99-001

Distribution:

Yukon Water Board	1 original unbound
	6 copies (CD format)
Yukon EMR Mineral Resources	1 original
	1 copy unbound
Golden Predator Corp.	2 copies
Tr'ondek Hwech'in First Nation	1 copy
Dawson City Community Library	1 copy

February 2013

Contents

APPENDICES

Appendix F – Geotechnical Inspection Reports

- Vista Tek Ltd Geotechnical Report
- Yukon Government Geotechnical Report

Appendix G- 2012 Annual Report LQ00364

Appendix H- Spill Reports

1.0 INTRODUCTION

The Brewery Creek Mine is currently owned and operated by Golden Predator Corp., who signed a purchase agreement with Alexco Resource Corp. in early 2012. The property is located in central Yukon approximately 55 kilometers east of Dawson City, and was operated as a conventional open pit heap leach operation continuously from 1996-2001. The mine was temporarily shut down in 2002. The mine closure and reclamation objectives are outlined in the 2003 Decommissioning and Reclamation Plan (DRP) required under the Water Use License.

The mine is licenced under Type A Water Use License QZ96-007 (originally issued as QZ9- 003 in August 1995) and Quartz Mining License A99-001 issued in June, 1999. Both licences 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. Golden Predator also has an application before the Yukon Environmental and Socio-economic Assessment Board (YESAB) which details their plans for re-opening the heap leach mine at Brewery Creek.

This report summarizes the 2012 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; however Golden Predator continues to monitor baseline conditions in anticipation of future use of the site.

2.0 OVERVIEW OF ACTIVITIES

In anticipation of further development on the Brewery Creek property, Golden Predator has been conducting monthly baseline monitoring of surface water sites. Currently under QZ96-007, this monitoring need only be conducted semi-annually.

The following tasks and activities were completed in 2012:

January 2012

- Baseline surface water quality monitoring was completed.
- Constant security and wildlife protection available on site during non-exploration months.

February 2012

- Baseline surface water quality monitoring was completed.
- Exploration activities begin on the property by Golden Predator on February 15th.

March 2012

- Baseline surface water quality monitoring was completed.
- Exploration activities conducted on the property by Golden Predator.

April 2012

- Baseline surface water quality monitoring was completed.
- Exploration activities conducted on the property by Golden Predator.

May 2012

- Baseline surface water quality monitoring was completed.
- Exploration activities conducted on the property by Golden Predator.

June 2012

- Surface water quality monitoring was completed per the sites and conditions under Water License QZ96-007.
- Baseline surface water quality monitoring was completed.
- Compliance In-pit water quality monitoring was completed per the sites and conditions under Water License QZ96-007.
- Exploration activities conducted on the property by Golden Predator.

July 2012

- Baseline surface water quality monitoring was completed.
- Compliance groundwater quality monitoring was begun per the sites and conditions under Water License QZ96-007.
- An inspection under the Water License QZ96-007 was conducted on July 4th at the Brewery Creek mine site by Yukon Government Water Resources staff.

- Exploration activities conducted on the property by Golden Predator.

August 2012

- Baseline surface water quality monitoring was completed.
- Exploration activities conducted on the property by Golden Predator.

September 2012

- Baseline surface water quality monitoring was completed.
- Vista Tek Ltd. visited the Brewery Creek mine site on September 19th and 20th to complete an engineering inspection of the waste rock dump reclamation works and various civil works structures.
- Exploration activities conducted on the property by Golden Predator.

October 2012

- Baseline surface water quality monitoring was completed.
- Groundwater quality monitoring was completed per the sites and conditions under Water License QZ96-007.
- The Yukon Government Water Resources Branch visited the Brewery Creek mine site on October 11th to complete a geotechnical inspection.
- YESAB visited the site on October 26th for a tour and information session with Golden Predator
- Exploration activities conducted on the property by Golden Predator.

November 2012

- Baseline surface water quality monitoring was completed.
- Exploration activities conducted on the property are halted for the winter.

December 2012

- Surface water quality monitoring was completed per the sites and conditions under Water License QZ96-007.
- Compliance groundwater and in-pit water quality monitoring was initiated per the sites and conditions under Water License QZ96-007
- Constant security and wildlife protection available on site during non-exploration months.

3.0 WATER USE

No water was withdrawn from Laura Creek or the groundwater well BC-23 in 2012

4.0 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 baseline 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. This data is downloaded once a month, at which point the station is also inspected to ensure it is functioning properly and any necessary maintenance is performed.

During the months of January and February the weather station was not functioning properly as a significant amount of frost had accumulated on the solar panel, which resulted in a dead battery. The issue was resolved, and data was again continuously collected from February on.

Appendix A contains a tabular summary of the 2012 climatic monitoring data.

4.1 Snow Survey

A snow survey is performed annually under the requirements of the Blue Pit and Blue WRSA snow monitoring survey. This year's snow survey occurred on February 27th, and 28th, and the results of which can be found in Appendix B.

5.0 WATER QUALITY AND HYDROLOGY

5.1 Water Quality Monitoring

Water quality sampling was performed as required by Schedule B of Water License QZ96-007. According to this schedule, monitoring has transitioned to the post-closure phase, which involves twice annual monitoring of water quality surveillance sites where conditions require.

Compliance monitoring events were conducted in June, shortly following freshet, and in December, during extreme low-flow conditions. Due to site access limitations however, monitoring which began in June was completed in October. Similarly with the December monitoring, extreme weather conditions and transportation limitations prevented sampling to completion, and thus a few a compliance sites have been monitored in early 2013.

Appendix C contains a Water Quality Assessment for the site.

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) and the *Standard Guide for Sampling Ground-Water Monitoring Wells* (STM D4448-01, ASTM International, PA, USA). All samples were preserved and filtered back in the lab following the day of collection. All samples were kept cool until shipment to Maxxam Analytics Inc., where they were analyzed for the following parameters:

- Routine parameters (conductivity, pH, total suspended solids, colour, hardness, total dissolved solids, turbidity, alkalinity, hydroxide, carbonate)
- Total suspended solids
- Anions (ammonia, nitrogen, phosphate)
- Total and dissolved organic carbon
- Cyanide (weak acid digestible)
- Total and dissolved metals (suite of 33 metals, including all parameters found in the CCME and MMER guidelines)

A Chain of Custody record accompanies all samples being shipped in order to ensure that the laboratory receives all samples, that the required analyses are completed, and to facilitate efficient sample tracking.

5.2 Hydrology

Stream flow measurements for stations situated along Laura Creek, Golden Creek, Lucky Creek, Lee Creek, and Pacific Creek were measured in 2012 when site conditions were appropriate to do so. 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)

Due to extreme cold conditions, thick ice cover, and inadequate water availability, stream flow measurements were not taken during December's monitoring event.

Inspection of the discharge channel from the outflow of the Overflow Pond siphon pipe has demonstrated each year that the discharge water goes to ground and does not enter receiving water directly. No direct surface water discharge was initiated in 2011 as the pond liners were removed in 2008 and the heap effluent meets water license criteria and now infiltrates in the ground within the reclaimed ponds.

Daily flows at the pump house (BC-1) were not recorded during the year as no direct surface discharge was carried out. Based on past experience, inspections, and monitoring, it has been demonstrated that significant flows at BC-1 are evident. Despite an observed increase in selenium concentrations on Laura Creek, results were rarely in excess of the SSWQS, 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 SSWQS for this area.

5.3 Bioassay Monitoring

Samples were collected from station BC-28a in September 2012, and a 96 hour LC50 bioassay was conducted using rainbow trout (Oncorhynchus mykiss). Results of this test were compliant with QZ96-007, and the results are presented in Appendix D.

6.0 AIR QUALITY

No air quality monitoring for mercury emissions was conducted in 2012 due to the dismantling of the ADR facility in 2004 and the cessation of refining.

7.0 SEDIMENT AND BENTHIC MONITORING

As specified in Part F, Clause 45, of Water License QZ96-007, sediment and benthic monitoring were both carried out in 2009. This ended the requirements for these monitoring programs under QZ96-007.

Sediment and benthic monitoring were completed in 2012 as part of Golden Predator's extended baseline monitoring program at Brewery Creek. Laberge Environmental Services completed the monitoring in August, and the details of that event, and the data collected, are presented by Laberge in Appendix E.

8.0 LEAK DETECTION AND RECOVERY SYSTEMS

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

9.0 EFFECTS ON WILDLIFE

No wildlife process – related mortalities occurred at Brewery Creek in 2012. The fence constructed in 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.

Detailed wildlife logs were kept on site, and employees were diligent on reporting any sightings on, or near, the Brewery Creek mine site. In particular, the process ponds were visually monitored regularly for bird and mammals. A copy of the wildlife log for 2012 is included in Appendix E.

10.0 RECLAMATION ACTIVITIES REPORT

An inspection of the reclamation activities and remaining liabilities was completed by Vista Tek Ltd. and the Yukon Government. Vista Tek visited the site and completed the inspection on September 19th and 20th, 2012. The Yukon Government inspection was conducted on October 11th, 2012. The Vista Tek inspection serves as the annual geotechnical report as well as a status of the reclamation progress to date.

Both inspection reports are presented in Appendix F.

Further, Golden Predator conducted progressive reclamation works on site in relation to exploration activities carried out under its Class IV Mining Land Use permit, LQ00364. Please refer to Appendix G.

11.0 REAGENT AND WASTE MANAGEMENT

11.1 Spill Occurrence and Response

No spills of the reportable quantity under the Yukon *Spills Regulations* occurred in 2012. A detailed log book of all spill occurrences is kept on site, and is available upon request.

Copies of the spill reports on site are included in this report and included in Appendix H.

11.2 Reagent Storage and Handling

Other than some miscellaneous laboratory chemicals, there are no reagents or chemicals in storage at the Brewery Creek Mine. During the removal of the liner in the pregnant pond, approximately 70 bags of sludge/carbon were removed. This material was re-bagged and shipped offsite in October 2009 for recovery of metals and final disposal.

12.0 WATER MANAGEMENT

12.1 Direct Release

A direct to ground release of solution from the heap leach overflow pond occurred on September 26, 2012 and for approximately 10 days. Discharging was conducted in compliance with Water License QZ96-007, Part F, Clause 39, *"At least 14 days prior to any release of effluent from the heap leach process, the licensee shall post public notice at various locations in the vicinity of the mine site"*. Before release, a 96 hour LC50 bioassay was also conducted using rainbow trout, and results met the non-toxicity requirement of 100%. These results are presented in Appendix D.

The approximate amount of solution released did not exceed 71,625 m^3 and the release was conducted at a rate not exceeding the daily flow rate in Laura Creek immediately above Carolyn Creek.

13.0 GEOTECHNICAL INSPECTION

Alexco Resources issued a report titled, Blue Zone Monitoring and Assessment Program (August 2005), as required by QML section 17.5.2. Section 3.1 of this report requires that an annual geotechnical inspection is conducted of the Blue WRSA and Pit for years 1-5 during mine reclamation. The next geotechnical inspection under this report is scheduled to occur in 2014.

The 2012 geotechnical investigation and subsequent report was conducted by Vista Tek Ltd. on September 19th and 20th, 2012. Results of this inspection are presented in Appendix F.

14.0 CLOSURE

We trust that the information presented in this report meets the requirements of our Annual Report required under our current Type A Water Use Licence QZ96-007. Should you have any questions or concerns please contact me 208-635-5415.

Regards,

Michael Maslowski

Americas Bullion Royalty Corporation

Chief Operating Officer

Appendix A – Climatic Data

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, Anthony Bier,

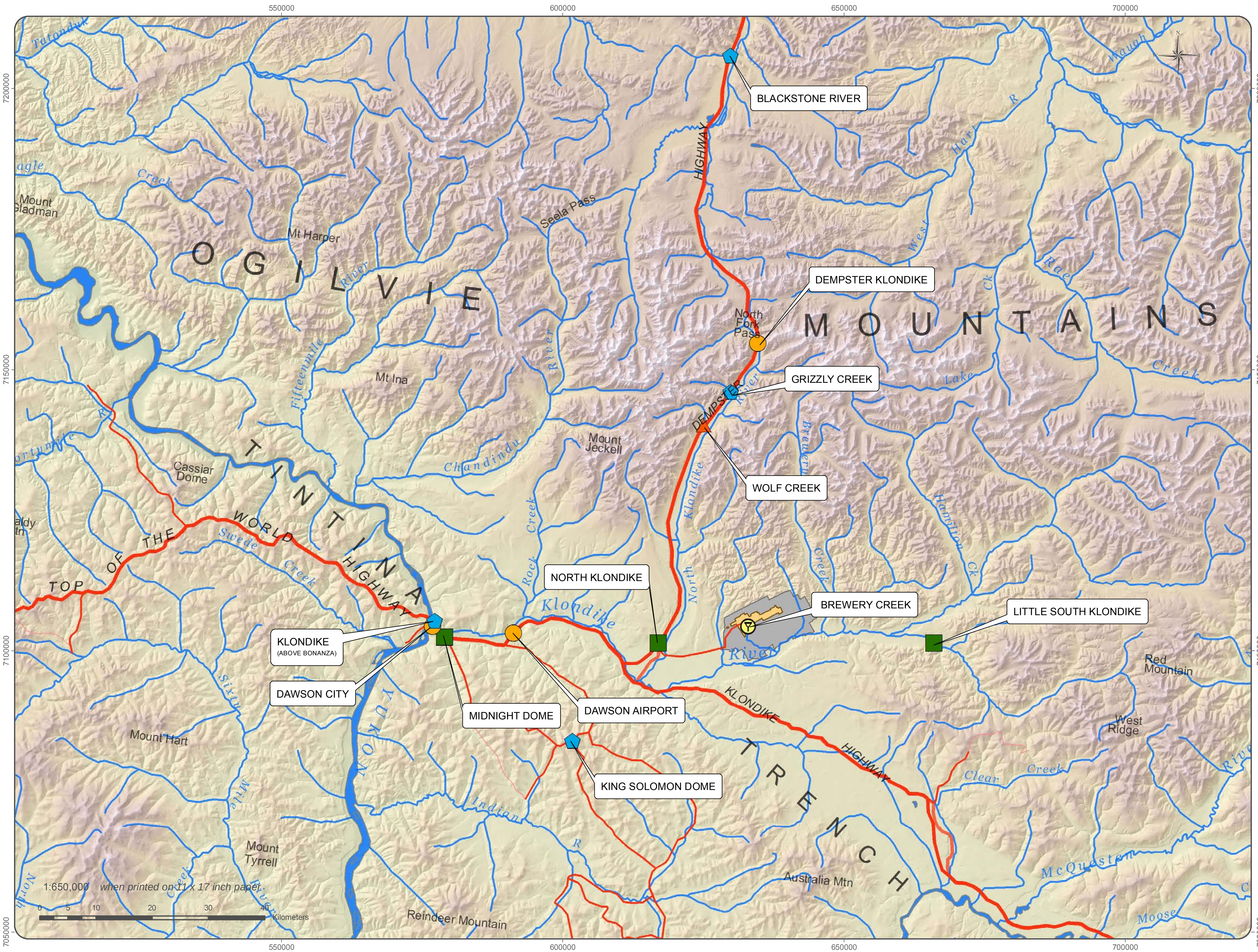
CC: Scott Davidson, Kai Woloshyn

Date: January 12, 2013

Re: Brewery Creek Site Meteorological Data Summary

INTRODUCTION

This memo summarizes the meteorological data collected in 2011 and 2012 at the Brewery Creek meteorological station, and compares it to data collected at the site since 1991 and at Dawson Airport (Dawson A) by Meteorological Services Canada. Although more parameters are collected and available, the focus is on those affecting the water balance; temperature, precipitation and evaporation. The newest station was commissioned on November 9, 2011 and is located at the following coordinates: (64.040669; -138.27948) and at an elevation of 837 meters above sea level. However, automated meteorological data collection began at Brewery Creek in August 1995 with manual observations from 1991-1995. 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

GOLDEN PREDATOR
TSX: GPD

- 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

NAD 83 UTM Zone 7N

ACCESS

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

INSTRUMENTATION

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

Table 1: Brewery Creek Meteorological Station 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

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 2: Brewery Creek Monthly Meteorological Data Summary 2011-2012

Year	Month	Monthly Air Temperature (°C)					Monthly Average Solar Radiation (kW/m^2)	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*	*0.41***	*11.37***		Station commissioned on Nov. 9th - 15 complete days during month
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	4.486	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	

**Precipitation may be underestimated (see Data Quality section below)*
***Wind speeds may be underestimated due to periodic icing of the wind sensor*

2011-2012 DATA QUALITY

The following notes and data gaps need to be considered when analyzing the 2011-2012 meteorological data:

- More than three months of data from late November 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 minimize data loss;
- Evapotranspiration is calculated based on several parameters, including relative humidity (RH), and is therefore invalid for the period where RH data is not available;
- 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 under-catch and under-estimation of snowfall. The situation was rectified on November 20, 2012.

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.

Air Temperature

Extreme monthly temperatures, average monthly extremes and monthly means are presented Table 3 and Figure 2 in for the period 1991-2010. This summary is based on monthly data, collected both manually and with the automated station. (Note that months where data were collected manually are generally partial with daily observations often not occurring on weekends). Individual annual data traces are shown in Appendix A.

Table 3: Brewery Creek Air Temperature Monthly Summary 1991-2010 (°C)

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

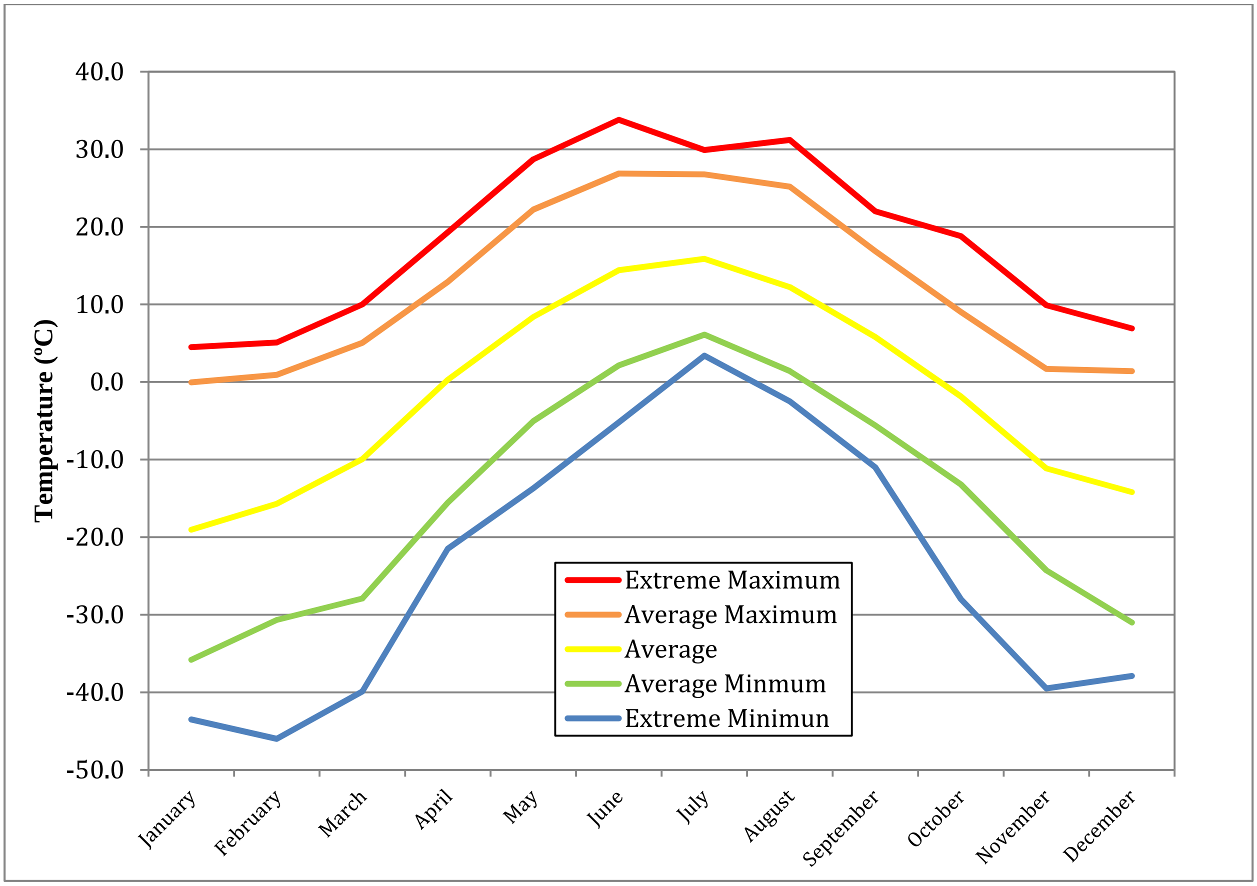


Figure 2 Brewery Creek Air Temperature, 1991-2010

Monthly mean and average daily maximum temperatures were generally lower in 2012 than the 1991-2010 average, but the average monthly minima were much warmer. Therefore, there was also a smaller range in temperatures measured in 2012 on a monthly basis.

Figure 3 and Figure 4 show the 1991-2010 January and July temperature trends, respectively. The January minimum temperature has been increasing at the most rapid rate (0.47°C/year), while the January maximum temperature has been decreasing at a rate of 0.55°C/year. The July minimum, average and maximum temperature have all been increasing. 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.

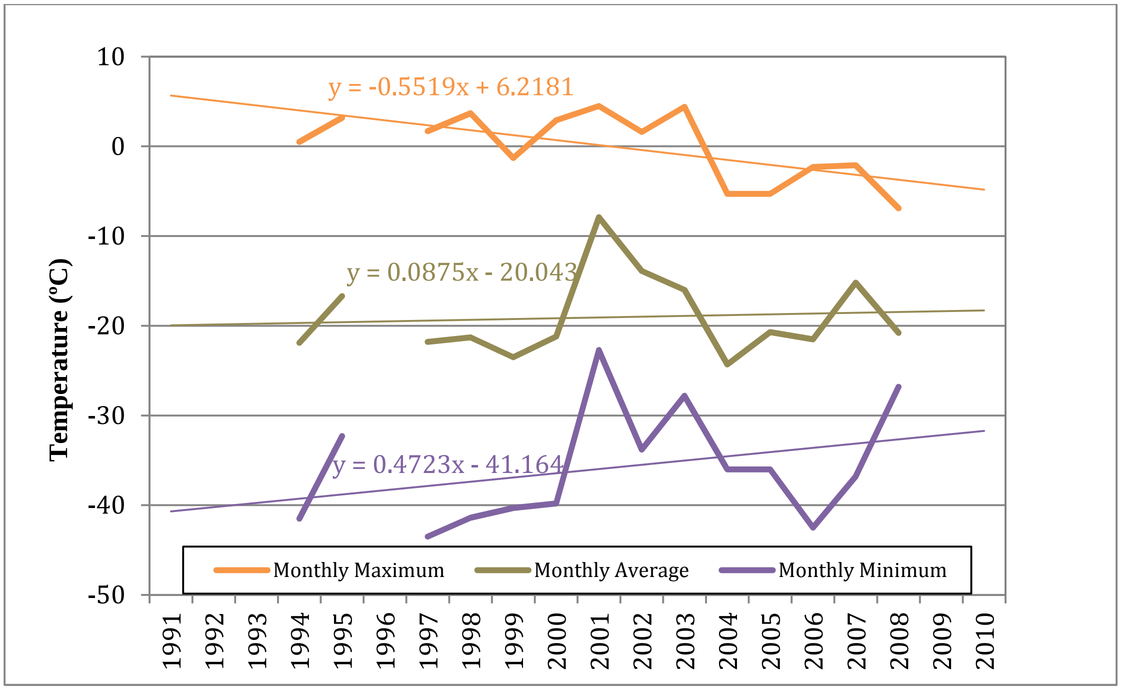


Figure 3: Brewery Creek Average January Temperature Trend

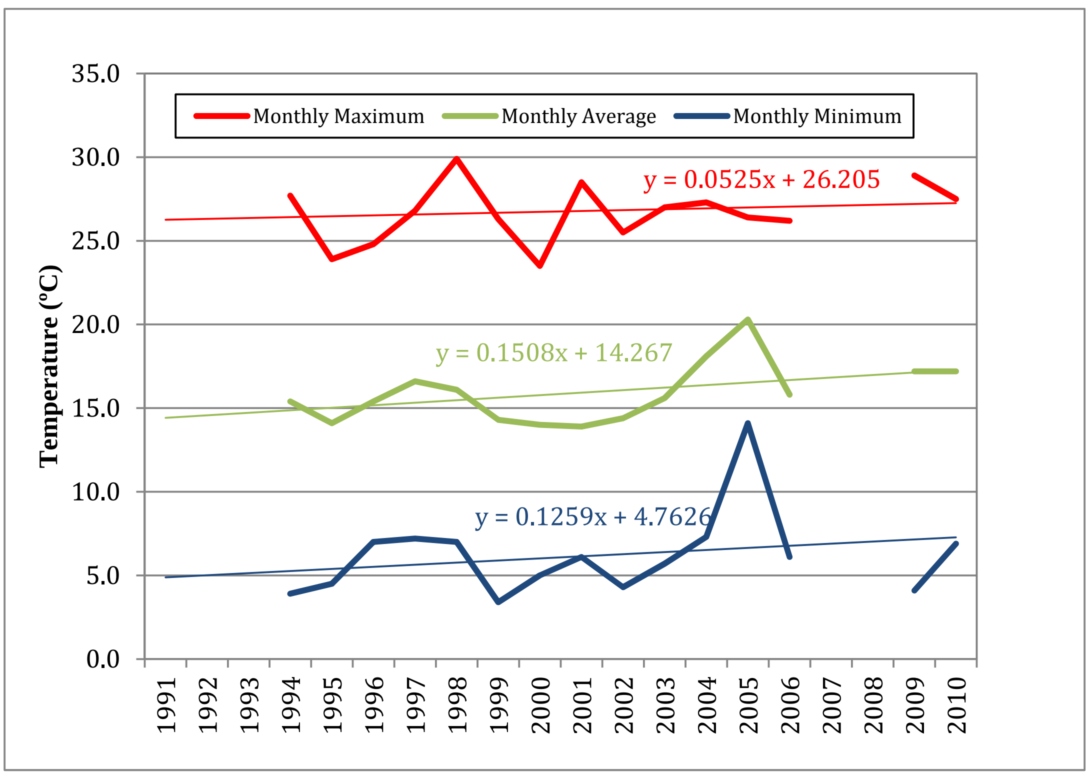


Figure 4: Brewery Creek July Temperature Trend

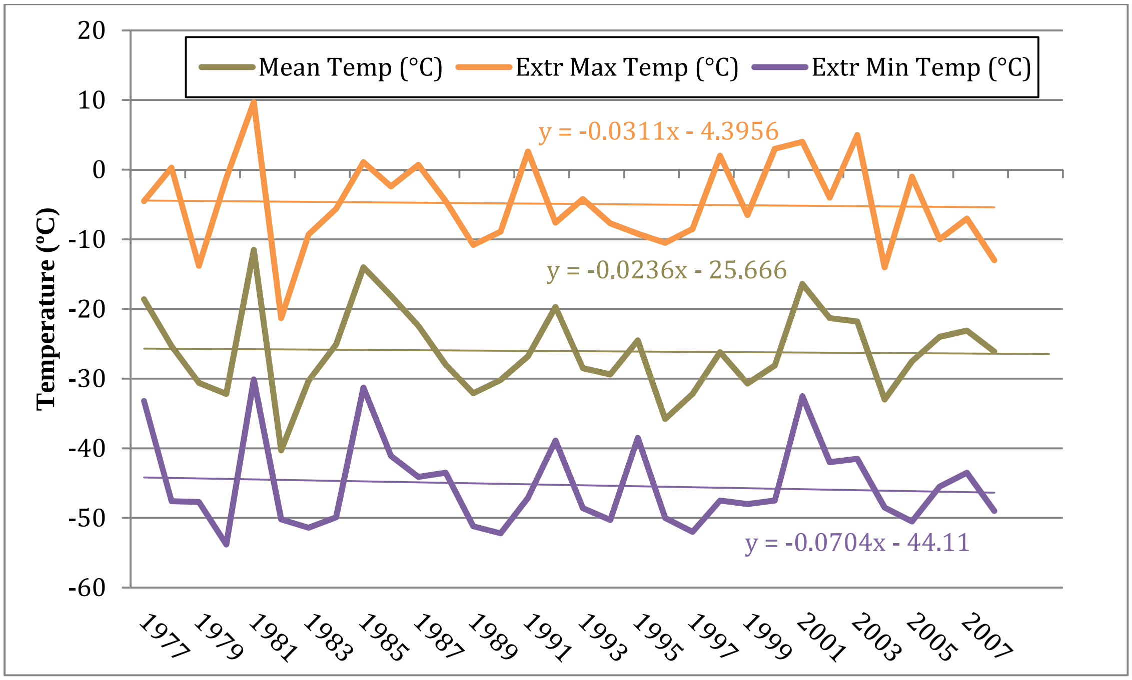


Figure 5: Dawson A January Temperature Trend

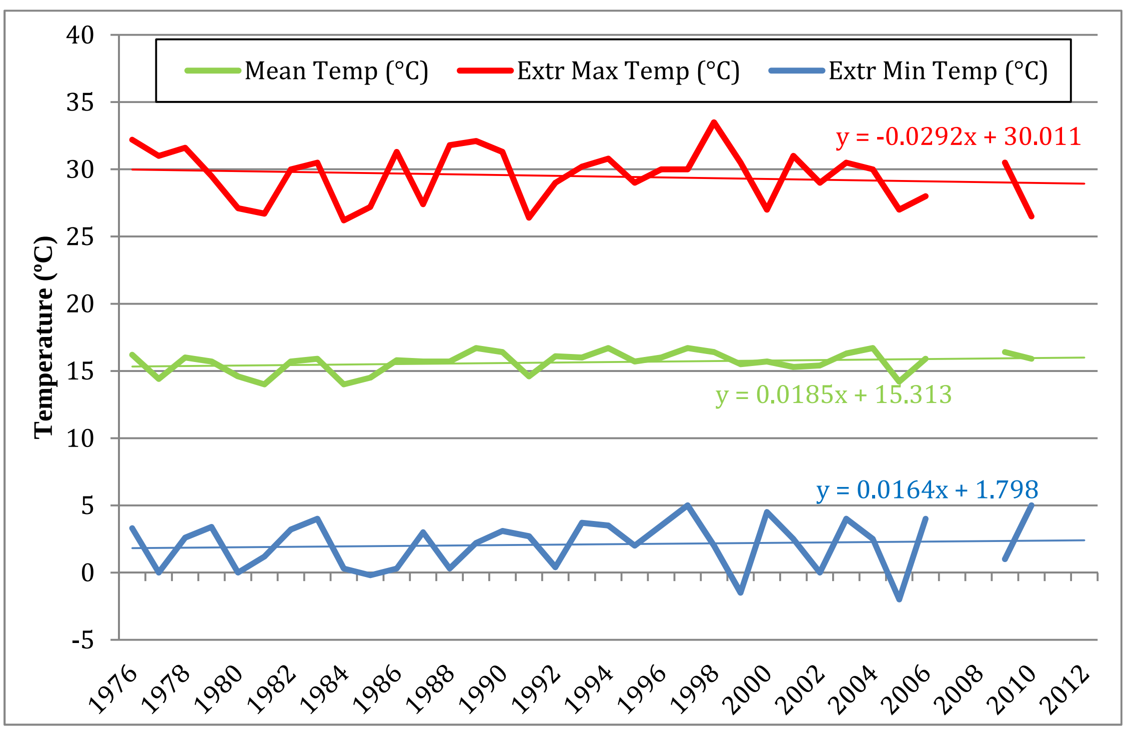
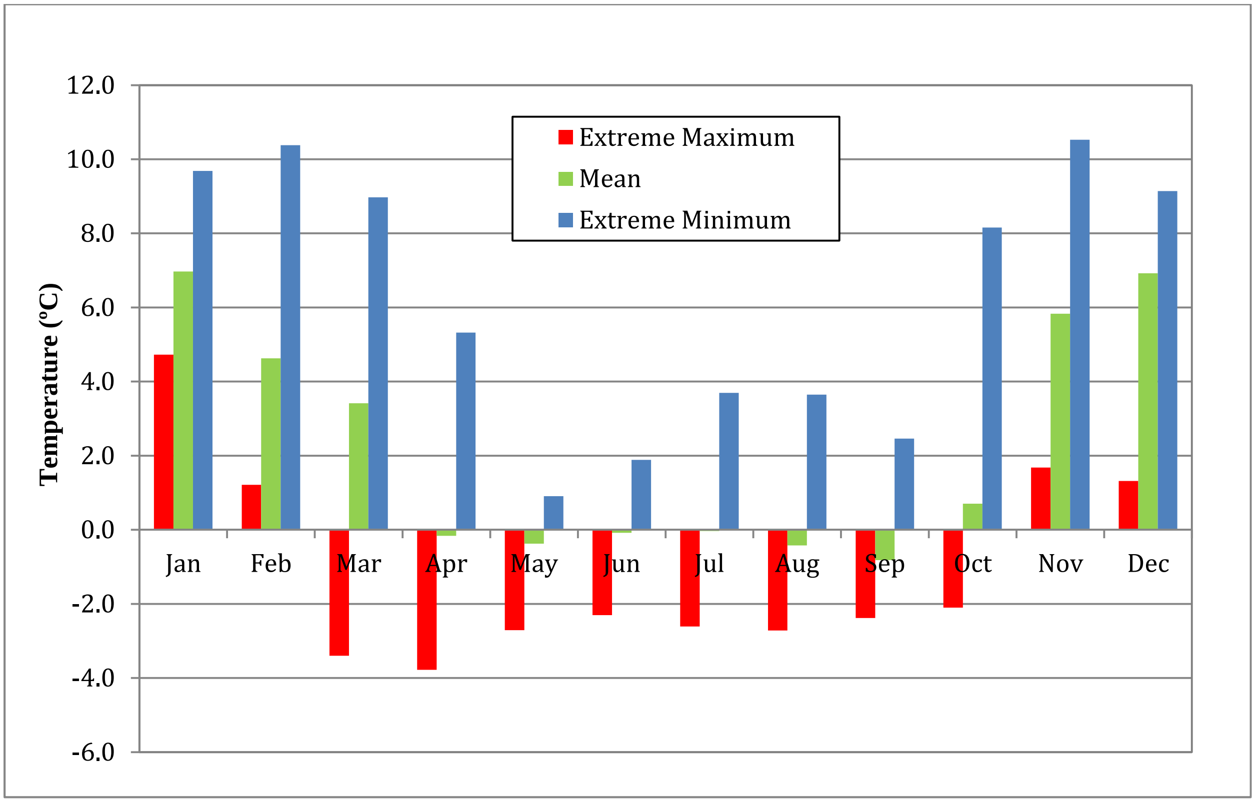


Figure 6: Dawson A July Temperature Trend

Comparing Brewery Creek temperature data with temperature data from Dawson A over the period 1991-2012 indicates that the annual mean temperature is on average 2.0°C warmer at Brewery Creek. The extreme maximum tempaterture is lower by 4.1°C and the extreme minimum temperature is warmer by 10.1°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.



**a positive difference indicates that the value is higher at Brewery Creek than at Dawson A*

Figure 7: Monthly Average Temperature Difference between Dawson A and Brewery Creek 1991-2012

Precipitation and Evaporation

Table 4 and Figure 8 show the annual precipitation and evaporation at Brewery Creek recorded between 1991 and 2010. Monthly values are presented in Appendix B. Values shown in italics were compiled using partial data and therefore underestimate total annual precipitation and evaporation. Lake evaporation is calculated using a pan coefficient of 0.70 multiplied by total potential evaporation (measured by evaporation pan) (Appendix C). Monthly total potential evaporation values are included in Appendix B.

The 2011-2012 data cannot be compared directly with 1991-2010 values as a complete year of data is not available for this period, however the precipitation total for the 2012 summer period (June to September inclusively) was less than the average calculated from the 1991-2010 data (145.3 mm vs. 177.4 mm, respectively).

Table 4: Brewery Creek Annual Precipitation and Evaporation

Year	Precipitation (mm)	Pan Evaporation (mm)	Calculated Lake Evaporation (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*	

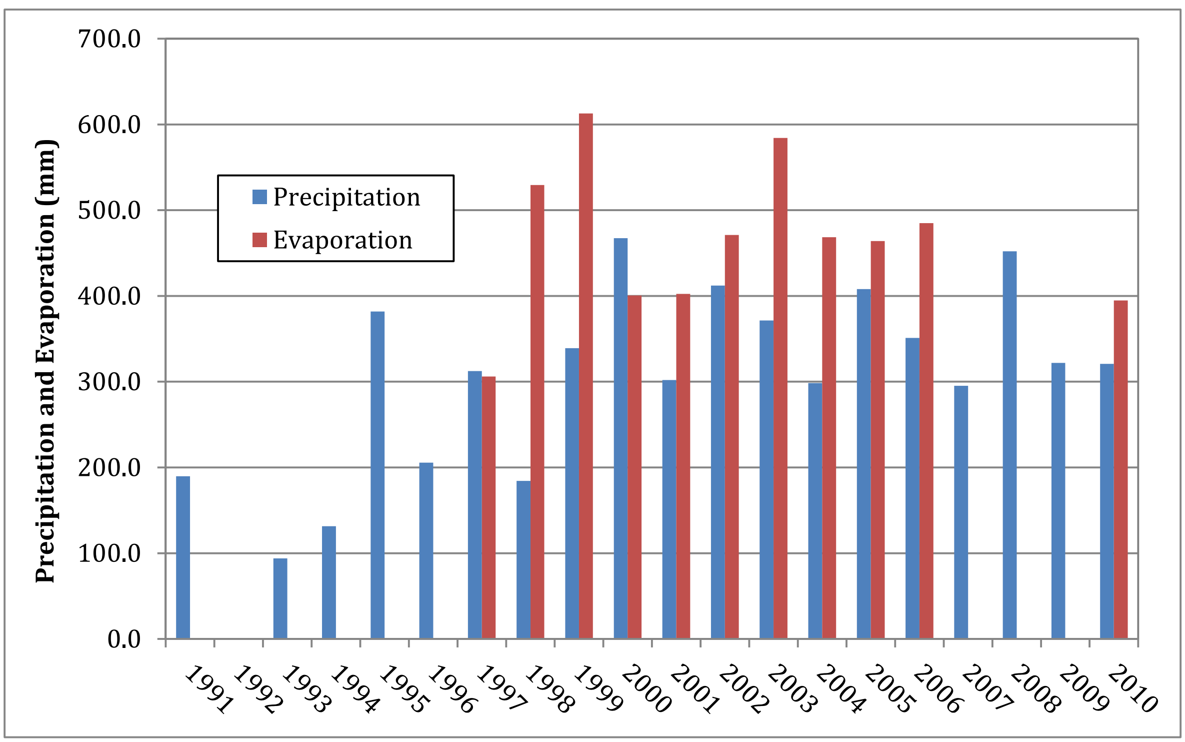
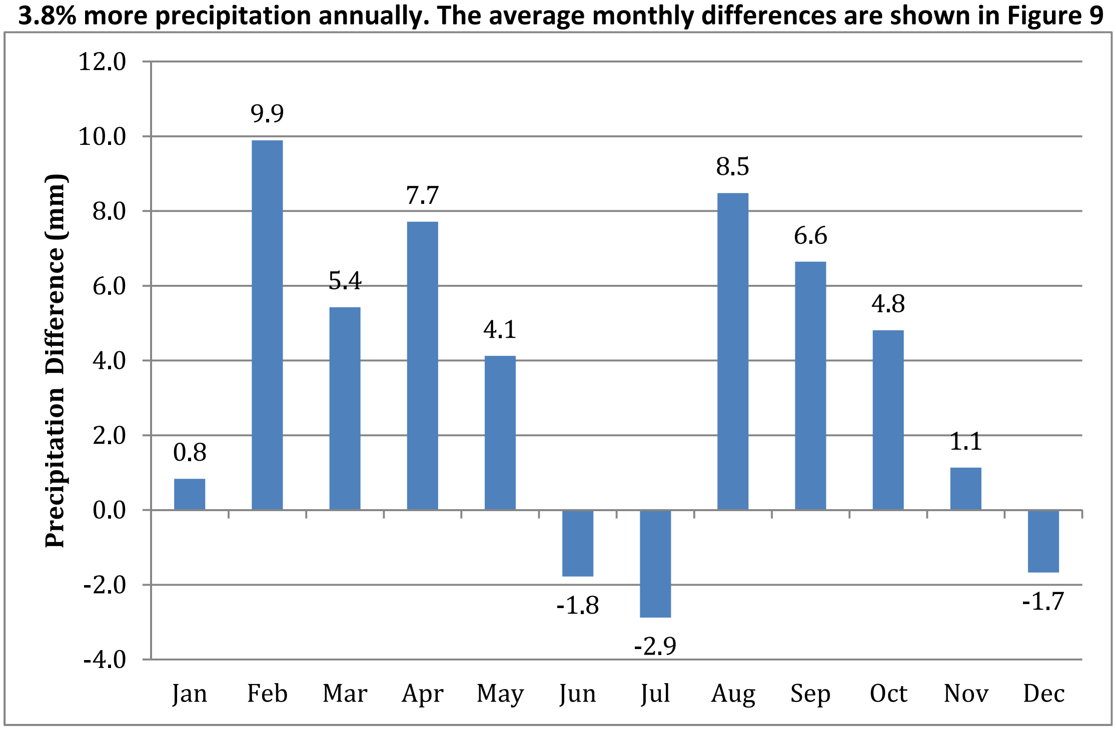


Figure 8: Total Annual Precipitation and Evaporation at Brewery Creek 1991-2010

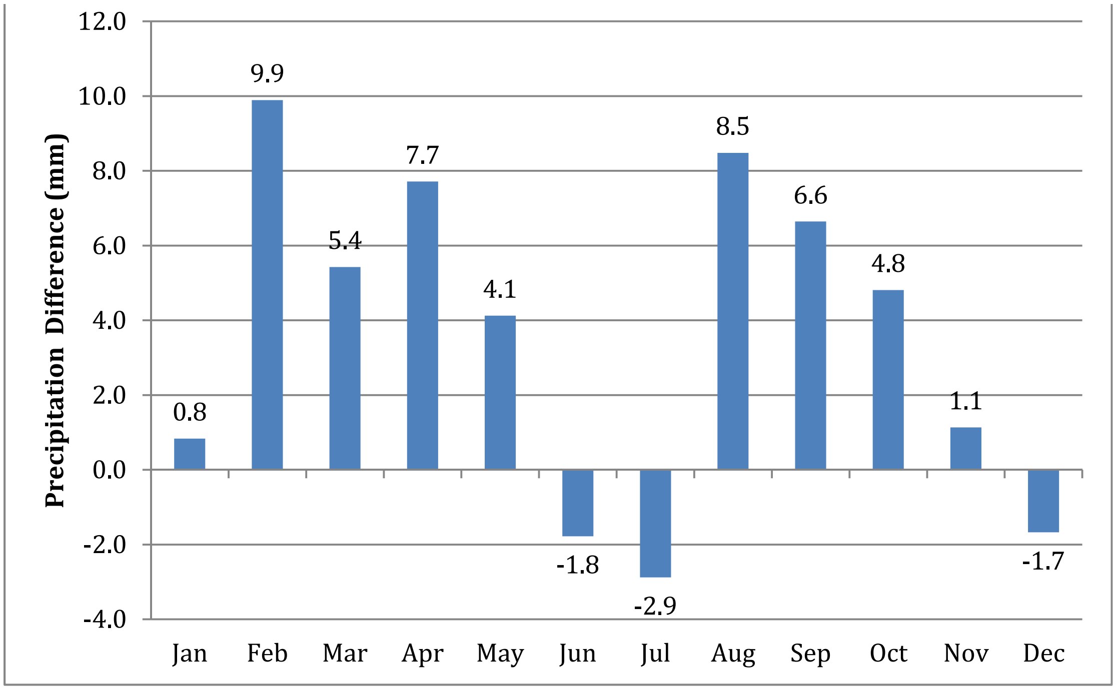
Total evapotranspiration for the 2012 summer period was 136.2 mm. Evapotranspiration is the evaporation from the ground surface and transpiration from vegetation and is commonly used for the total catchment water balance. An evapotranspiration calculation was incorporated into the datalogger program instead. This instruction uses the following input parameters: average daily max temperature, average daily minimum temperature, average daily wind speed and average dew point temperature, and is calculated for a short grass crop, as recommended by Campbell Scientific. It only provides an approximation of evapotranspiration as specific terrain features and vegetation need to be considered. 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. Clearwater Consultants Limited (CCL) recommended adopting a conservative estimate of 390-400mm for water balance purposes (Appendix C). The data collected from 1991-2010 suggest that on average lake evaporation may be even lower than the CCL estimate (Appendix C).

When comparing the precipitation record from Brewery Creek with Dawson A for the period 1991-2012 (using seven years for which all months are available at both sites), it was found that Brewery Creek receives on average 11.5 mm more precipitation annually. This corresponds to an average of 3.8% more precipitation annually. The average monthly differences are shown in Figure 9

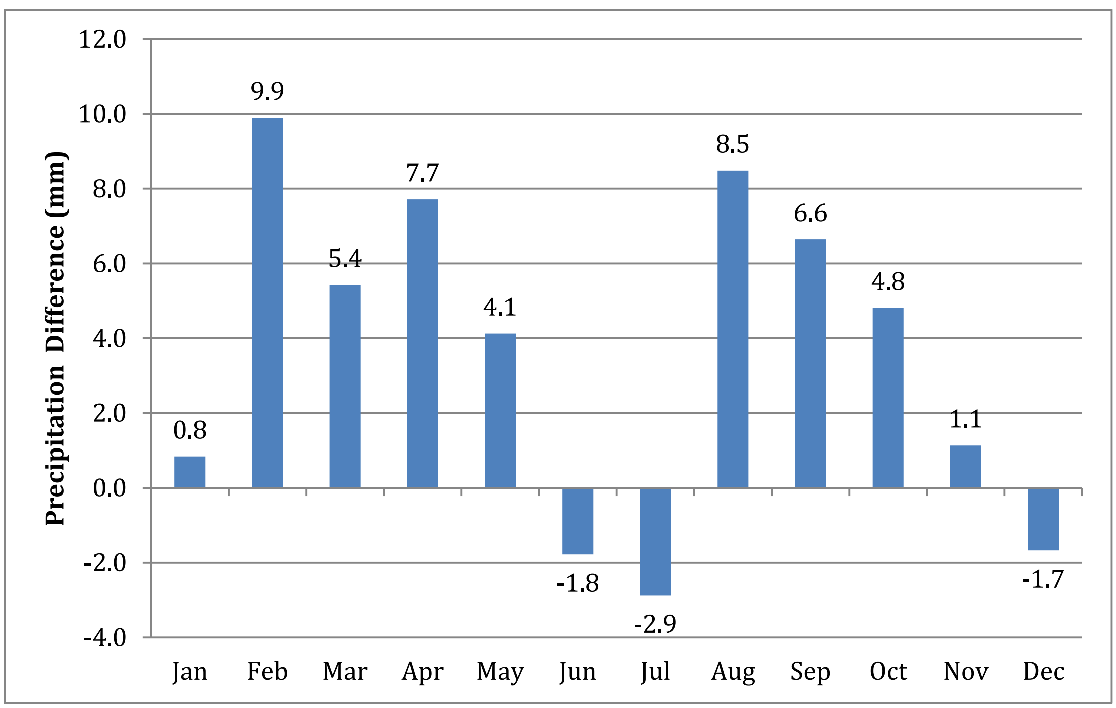


**a positive difference indicates that the value is higher at Brewery creek than at Dawson A*



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

Figure 9.



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

Figure 9: Average monthly precipitation differences between Brewery Creek and Dawson A 1991-2012

SNOWPACK

Snow pack observations have been taken at the Brewery Creek property since 1995. Clearwater Consultants Ltd. (CCL) reviewed the data to date in 2000 (Appendix C). The following is an excerpt from their Design Memorandum CCL-BCM3 (Appendix C):

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 ar. 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 snow survey data are available since 1975 for the Midnight Dome station operated by Water Resources. Table 3 [Appendix C] *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 [Appendix C] *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* [Appendix C]*). 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-ar 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 [Appendix C]*), 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.*

Table 5 and

Table 6 are taken from CCL-BCM3 (Appendix C) and updated with data collected since 2000. The general snow survey procedure noted by CCL continued till 2004 although with far less frequency. No survey data were found for 2005. In 2006, a different set of survey sites were implemented and surveyed until 2010. 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. Equal weight is given to each site in computing the average.

Table 5: Snowpack Water Equivalents (mm) – Brewery Creek and Midnight Dome

Year	Station	Comment	Elevation (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	Natural Ground	855	2			150	170	123
1996	Brewery Creek	Natural Ground	760-780	3		78.4		92.4	
	Midnight Dome	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	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	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	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		

Year	Station	Comment	Elevation (m)	Note	Jan-01	Feb-01	Mar-01	Apr-01	May-01
	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	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	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	
	Brewery Creek	All Data	740-850	18	37.9	58.4	80	77.5	
	Midnight Dome	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	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	Natural Ground	855	16			153	190	167

Year	Station	Comment	Elevation (m)	Note	Jan-01	Feb-01	Mar-01	Apr-01	May-01
2005	Midnight Dome	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	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	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	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	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	
	Midnight Dome	Natural Ground	855	16			110	160	98
2011	Midnight Dome	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	Natural Ground	855	16			153	184	188

Table 6 summarizes the data presented in Table 5. The natural ground snowpack at Brewery Creek is 84% and 75.5% of the snow water equivalent of Midnight Dome on March 1st and April 1st respectively (Table 5). This is a different trend than the total precipitation measured at Dawson A versus Brewery Creek which shows Brewery Creek receives more precipitation including all winter months except December (Figure 7). There are several possible reasons for this difference including elevation and possible site exposure. Dawson A is in the lower Klondike River valley (370.3 masl) and Midnight Dome is at an elevation of 855 masl and is a rock knob which may be subject to localized orographic precipitation effects. The snow surveys at Brewery Creek span a greater elevation range. No specific evaluation of snow survey site exposure has been made as part of this work but the more exposed a site is the more susceptible it is to wind drifting effects which can significantly affect the results of snowpack monitoring.

Table 6: Average Snowpack Water Equivalent (mm)

ars	Station	Comment	Elevation (m)	Note(s)	Jan-01	Feb-01	Mar-01	Apr-01	May-01
1995-2012	Brewery Creek	Natural Ground	740-850		54.9	81.6	110.0	106.8	
	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	133	
	Brewery Creek	All Data	740-850		49.6	77.0	97.8	106.1	
	Midnight Dome	Common years with BCM	855				130.9	141.5	
	Midnight Dome	All years 1995-2012	855				129.4	148.4	137.4
1975-2012	Midnight Dome	All available years				98	132	149	128
Midnight Dome – Average (1995-2012) / (1975-2012)							98.03%	99.60%	107.34%
1995-2012	**Ratios of (Brewery Creek to Midnight Dome)**								
	Natural Ground						84.01%	75.45%	
	Within leach pad area						70.74%	81.01%	
	All Data						74.75%	74.99%	

Notes for Tables 5 and 6

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 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) 1998-2004 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 2006-2012, leach pad averages are not area weighted.

18) For 2000-2012 all sites are given equal weight in average calculation.

19) For 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)

PRECIPITATION FREQUENCY ANALYSIS

Please refer to Appendix C for the most recent precipitation frequency analysis.

REFERENCES

Environment Yukon 2012. Yukon Snow Survey Bulleting & Water Supply Forecasts, May 1, 2012

APPENDIX A

BREWERY CREEK MONTHLY TEMPERATURES

Table A-1: Brewery Creek Monthly Mean Temperature 1991-2010 (°C)

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		

Table A-2: Brewery Creek Monthly Maximum Temperature 1991-2010 (°C)

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

Table A-3: Brewery Creek Monthly Minimum Temperature 1991-2010 (°C)

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		

APPENDIX B

BREWERY CREEK MONTHLY PRECIPITATION AND EVAPORATION

Table B-1: Brewery Creek Monthly Precipitation Totals (mm)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann.
1991					11.4	16.7	23.8	94.1	43.7				*189.7*
1992													
1993									18.4	20	35.3	20.3	*94*
1994	1.6								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	0		*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	339.2
2000	29	16	17.1	19.5	48.5	60.3	104	40.2	70.3	17.7	21.9	23	467.4
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	301.9
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
2010						41.2	82	39.1	70.5	88			*320.8*
2011													
2012			6.1	0	5.3	20.6	62.5	33.5	28.7	27.7			
Mean	**16.5**	**19.1**	**14.5**	**16.1**	**29.7**	**35.8**	**48.9**	**49.5**	**42.0**	**29.1**	**21.6**	**21.0**	**343.8**

Note: Totals in grey italics were compiled with one or more missing months

Table B-2: Dawson A Monthly Precipitation Totals (mm)

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann.
1991	34.4	22.4	20.2	0.8	11	21.8	56.6	71.8	49.6	23	31.6	19	**362.2**
1992	37.4	17.6	7.2	11.9	36.8	49.8	55.4	49.2	25	20.6	24.6	17.8	**353.3**
1993	24.9	12.3	12.2	1.2	26.4	40.8	22.4	49.5	35.8	13.9	34.8	15.5	**289.7**
1994	6.6	3.2	29	9.2	13.2	55.9	52.6	33.2	24	43.4	27.8	8.2	**306.3**
1995	11.4	13.2	11.8	5.8	61.4	20.2	64.8	35.4	41.2	27.2	**9.4**	**19.1**	**320.9**
1996	8.3	14.6	8.2	7	11.5	28.6	10.7	41	31.8	30.4	18	20	**230.1**
1997	17.6	6	5.4	5.2	24.2	84.6	60.8	53.8	16.2	34.8	14.4	28	**351**

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Ann.
1998	11.7	4	0	0.2	42.4	53.4	16	25.8	21.8	7.1	8.3	16	**206.7**
1999	11	14.6	10.8	13.6	34.3	16.7	32	63.7	22.6	57.6	36	56	**352.1**
2000	28.4	9.6	5.2	5.4	20.4	60.5	99	30.2	50.5	34.8	13.6	10.8	**357.7**
2001	26.6	17.4	5.6	5.6	27.1	23	91	23.2	28	21	14.8	12.2	**295.5**
2002	14.6	9.6	10.2	12.4	44.9		52	78.3		26.8	14.4	32.8	
2003	4.6	10.2	10	0	42.6	31.6	37.9	40			35.6	29.6	
2004	24.8	11.4	11.2	8		12.8	32.6	8.2	24.6	41.9	19.8	42.2	
2005	20.2	14.8	14.6	5.4	18.7	51.3	46.8	38.3	50.6	18	49	17.4	**345.1**
2006	5.2	4.2	1.8	25	21	48.6	30	49.8	39.8	28.4	4.8		
2007	24	1.4	15	8.8		14	53.7		60.4	8.2	16.2	12.8	
2008	18.2	2.2	8.8	8.2	15.8		157.7	42.2	38.4	17.7	25.4	12.6	
2009	23.4	8.6	13.8	0.4	11.4	62.4	16.4		43.8		17.2		
2010			6.2	0.6	6.4	50	52.8	45.8	10	12.6			
2011	25.1								36.4			40.6	
2012			12.6	13.4	21.6	22.8	50.8	35.3	33.3				
Mean	**16.7**	**9.5**	**9.0**	**8.5**	**29.0**	**37.1**	**50.4**	**41.5**	**32.4**	**24.9**	**22.4**	**23.3**	**305.5**

Note : Totals in grey are months for which now Brewery Creek data are available for comparison.

Table B-3: Brewery Creek Monthly Evaporation

Year	May	Jun	Jul	Aug	Sep	Oct	Annual
1997			138	85.8	82.2		*306*
1998		148	199.6	128.5	53.3		*529.4*
1999	75.9	181.8	169.8	128.5	56.8		612.8
2000	45.9	130.8	106.6	80	37.2		400.5
2001	19.9	145.6	93.9	82.1	44.9	16	402.4
2002	121.7	118.7	119.6	50.3	36.3	24.5	471.1
2003	97.3	151.5	149.7	112.1	47.2	26.4	584.2
2004	77.4	142.6	112.6	103.4	32.5		468.5
2005	87.9	128.6	119.9	77.7	49.9	0	464
2006	75.8	138.8	135.7	86.6	48.1		485
2007							
2008							
2009							
2010		197.3	49.8	87.1	60.6		*394.8*

**totals in grey italics were compiled with one or more missing months*

APPENDIX C

DESIGN MEMORANDUM CCL-BCM3, CLEARWATER CONSULTANTS LTD.

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.

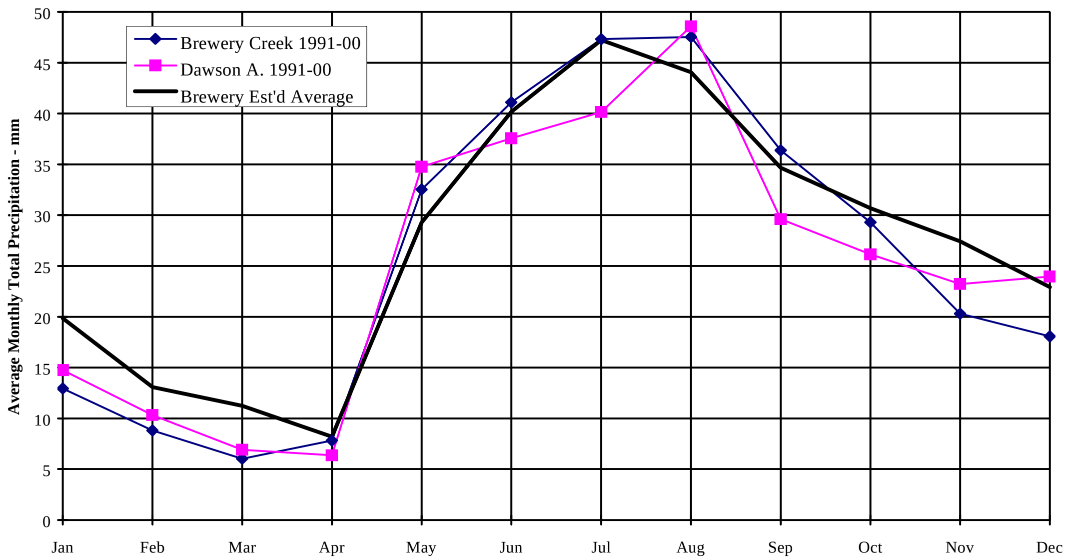
Regional data used in the comparisons reported herein include:

- 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

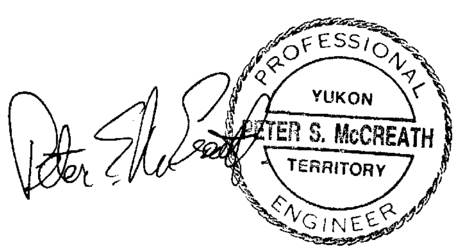
It is recommended that the lower value of 390 to 400 mm be conservatively adopted for average annual lake evaporation at Brewery Creek for the evaluation of water storage requirements for the heap leach pad. Make-up water requirements should be conservatively assessed using the higher value of about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

CLEARWATER CONSULTANTS LTD.



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 – Snow Survey

Included in Appendix A report on Climatic Data pages 14-20

Appendix C – Water Quality Assessment

ACCESS
CONSULTING GROUP

Brewery Creek Mine

2012 Water Quality Assessment for Water Licence QZ96-007

March 2013

Prepared for:

Golden Predator Corp.

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

March 1, 2013

Golden Predator Corp.
attn.: Jillian Chown
1 Lindeman Road
Whitehorse, YT Y1A 5Z7

Dear Jillian Chown:

Regarding: Brewery Creek Mine Water Quality Assessment

Please find enclosed the Water Quality Assessment for the QZ96-007 Annual Report. If you have any questions regarding this report do not hesitate to contact me at 604-633-4888 ext. 141

Sincerely,
Access Consulting Group

Tiffany Lunday
Environmental Scientist

DISTRIBUTION LIST

# of copies	Company/Agency name
1	Golden Predator Corp.
1	Access Consulting Group

ACCESS CONSULTING GROUP SIGNATURES

Report prepared by:

Tiffany Lunday, M.Sc.
Environmental Scientist

Report reviewed by:

Kai Woloshyn, B.Sc.
Environmental Manager

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 2 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. 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 2012 water quality monitoring program carried out by Golden Predator at the Brewery Creek Mine pursuant to the licence conditions of WL QZ96-007. This report also includes an examination of additional baseline sampling conducted during 2012 in anticipation of the mine re-opening. The results and discussion herein include results of all sampling carried out over the course of the mine life, including a discussion of the 2012 data relative to historical conditions. The 2012 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 relatively small catchment of total 30.5 km^2 combined area. 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.

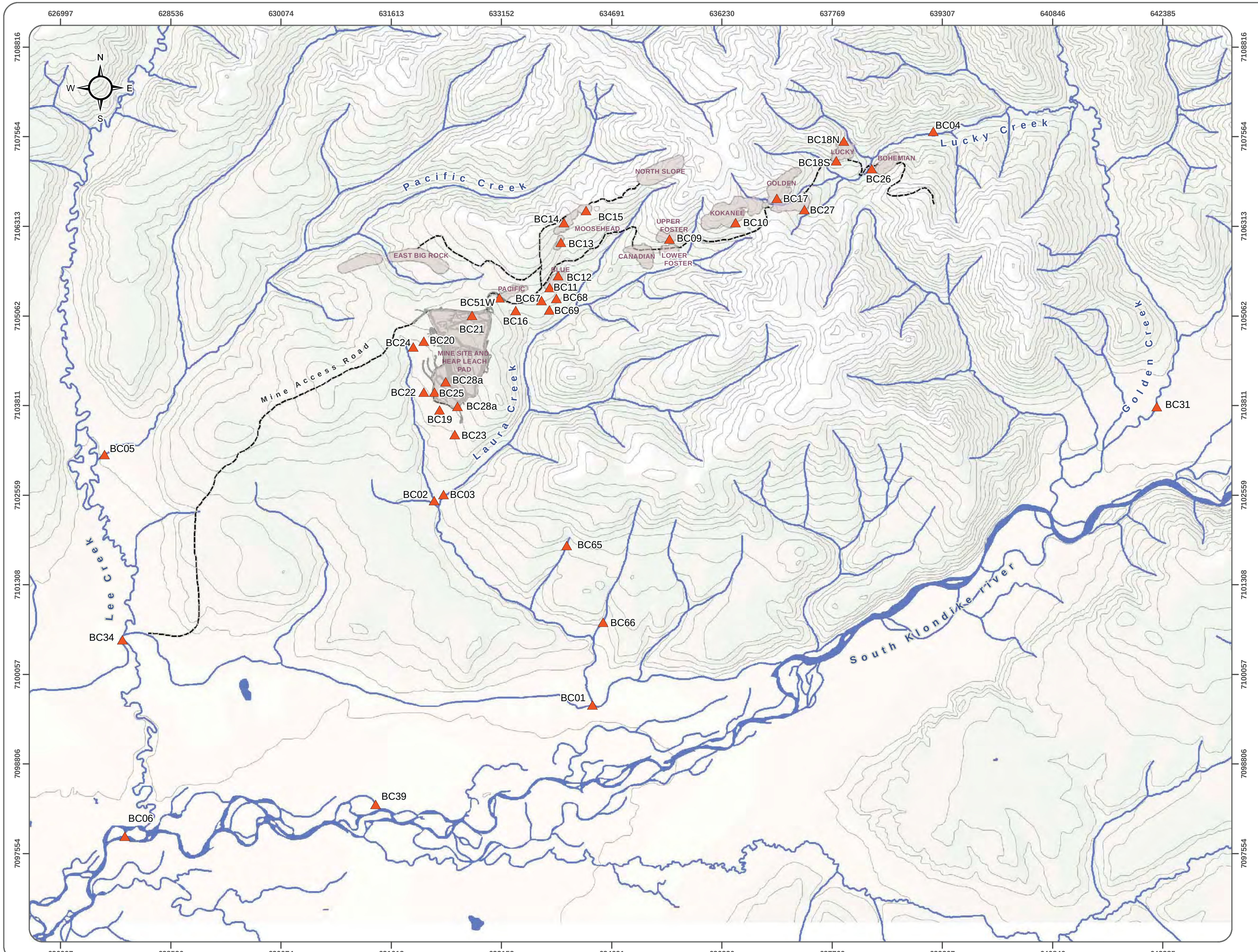
Lucky Creek headwaters originate near the Lucky and Golden pits in the eastern portion of the property, and flow east-northeast to converge with Golden Creek, which then flows south to converge with the South Klondike River, south of the property. Golden Creek is the upstream-most mine-impacted creek to converge with the South Klondike River, followed by Laura Creek, and finally Lee Creek in the west.

The historical workings consist of seven open pit areas (nine pits total), which influence 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*



ALEXCO

BREWERY CREEK MINE

FIGURE 1-1

WATER QUALITY STATIONS

NAD 83 UTM Zone 7N

0 0.5 1 2 Kilometers

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

ACCESS

DRAWN BY MD	FEBRUARY 2012	VERIFIED BY TL

I:\ALEX-05-01\gis\mxd\BreweryCreek\2012\WQ_Stations_20120216.mxd
(Last edited by: mducharme;17/02/2012/15:30 PM)

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 involves twice-annual monitoring of water quality surveillance sites where conditions allow. These events are conducted shortly following freshet, in June, and again in September 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.

During 2012, Golden Predator has carried out pre-production exploration activities in anticipation of re-opening the mine, concurrent with ongoing reclamation monitoring activities. A baseline program of sampling has thus been carried out in concert with sampling required under QZ96-007. The results of both programs are discussed in this report.

Water quality sampling was performed as required by Schedule B of Water Licence QZ96-007, and can be found in Appendix A 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); however for antimony, the Provincial Water Quality Objective for Ontario (PWQO; OMOE 1994) was chosen as no CWQG exists.

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 mg/L. For results obtained prior to 2006, information on the nitrogen species measured is not available; therefore the more conservative guideline of 3 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 and Provincial Water Quality Objectives (Ontario) Used in the Assessment

Parameter	Units	Guideline	
		Source	Value (mg/L)
Antimony	mg/L	PWQO	0.02
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
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 condtion.

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 Licence 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 assessed on the basis of a few metrics via different methods. 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/PWQO and reference). Third and lastly, summary statistics and trends in the data are discussed, with a focus on the 2012 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.

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 3-3-)**. One of these 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, and the other downstream of it. 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 the present.

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

Stations on Lucky Creek and Golden Creek		Included in Assessment
BC-36	Golden Creek upstream of Lucky Creek	Yes
BC-31	Golden Creek downstream of Lucky Creek	Yes
BC-04	Laura Creek 50m u/s Ditch Road	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 (Figure 3-1). 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.

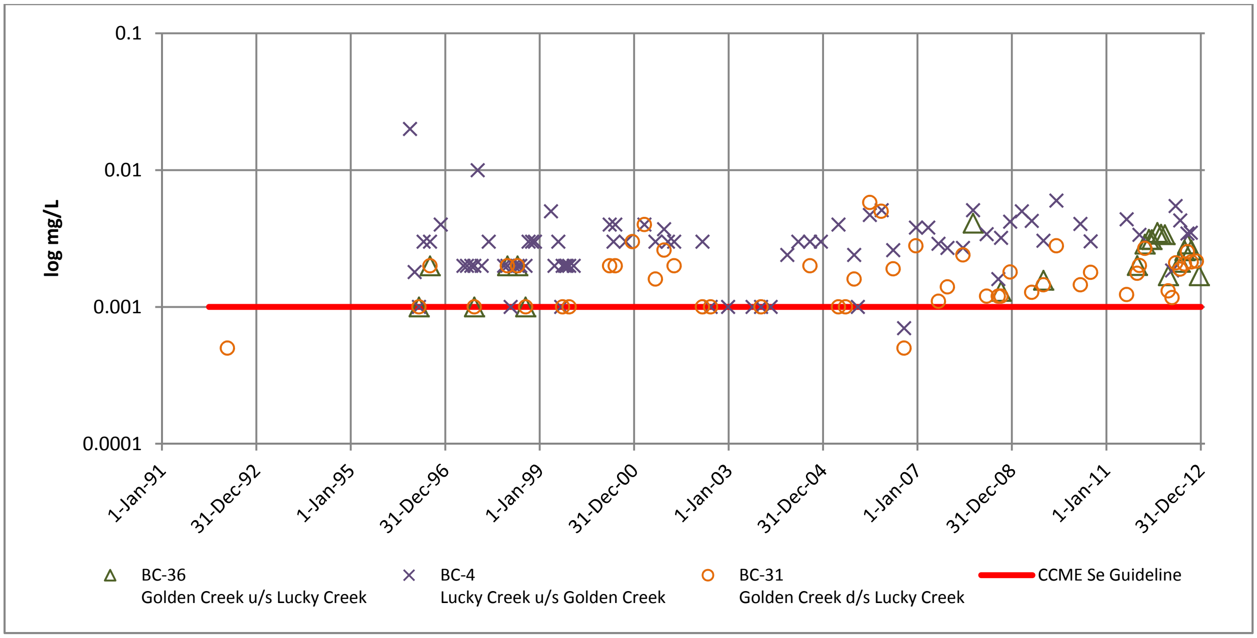


Figure 3-1 Selenium Concentrations, 1991 – 2012, Lucky and Golden Creeks

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) (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), 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 CCME guideline for antimony, and as such it poses little threat to the receiving environment in either Golden or Lucky Creeks.

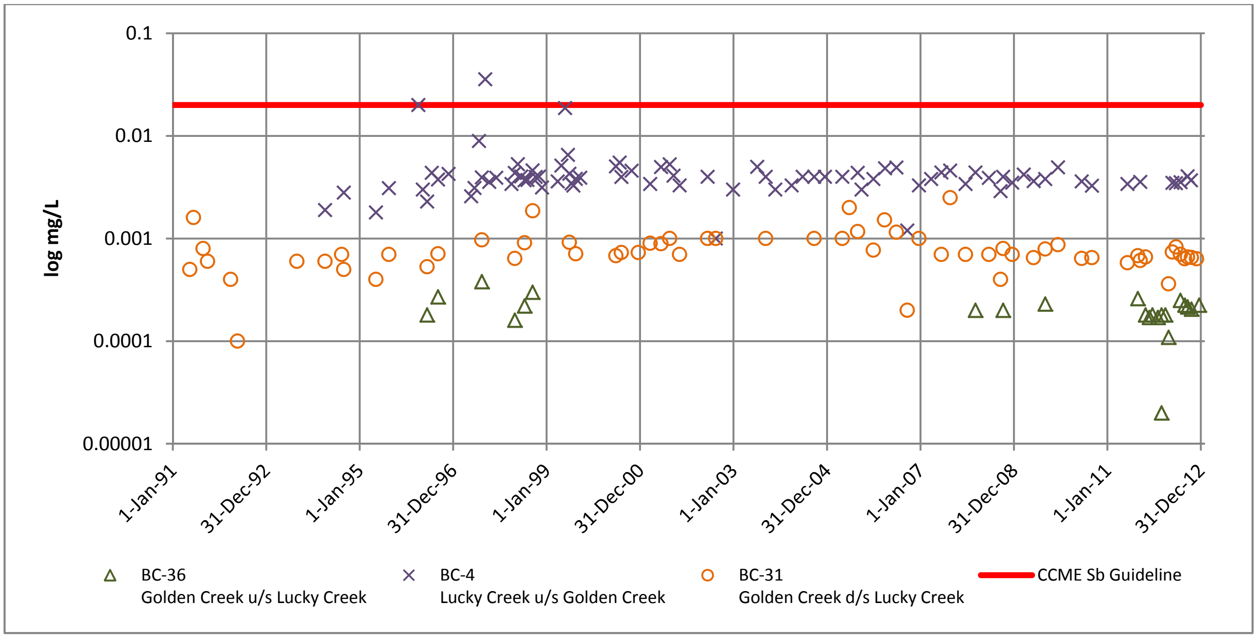


Figure 3-2 Antimony Concentrations, 1991 – 2012, Lucky and Golden Creeks

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 (Figure 3-14). Here too arsenic concentrations are constant during 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 roughly 40% of samples.

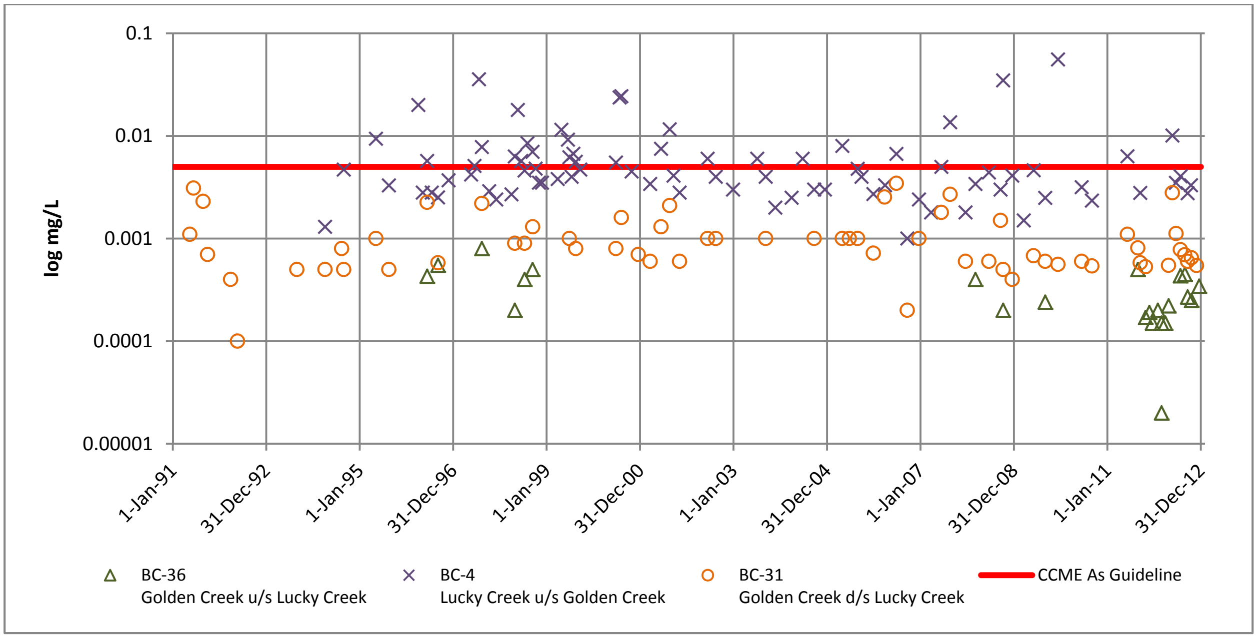


Figure 3-3 Arsenic Concentrations, 1991 – 2012, Lucky and Golden Creeks

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 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 A 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 (**Table 3-2)**. Each creek contains one reference, 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.

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 3-4 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 (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 2012 exceeded the background condition in the downstream receiver on Lee Creek (BC-34), although all of the results were in excess of the CCME guideline (Figure 3-4).

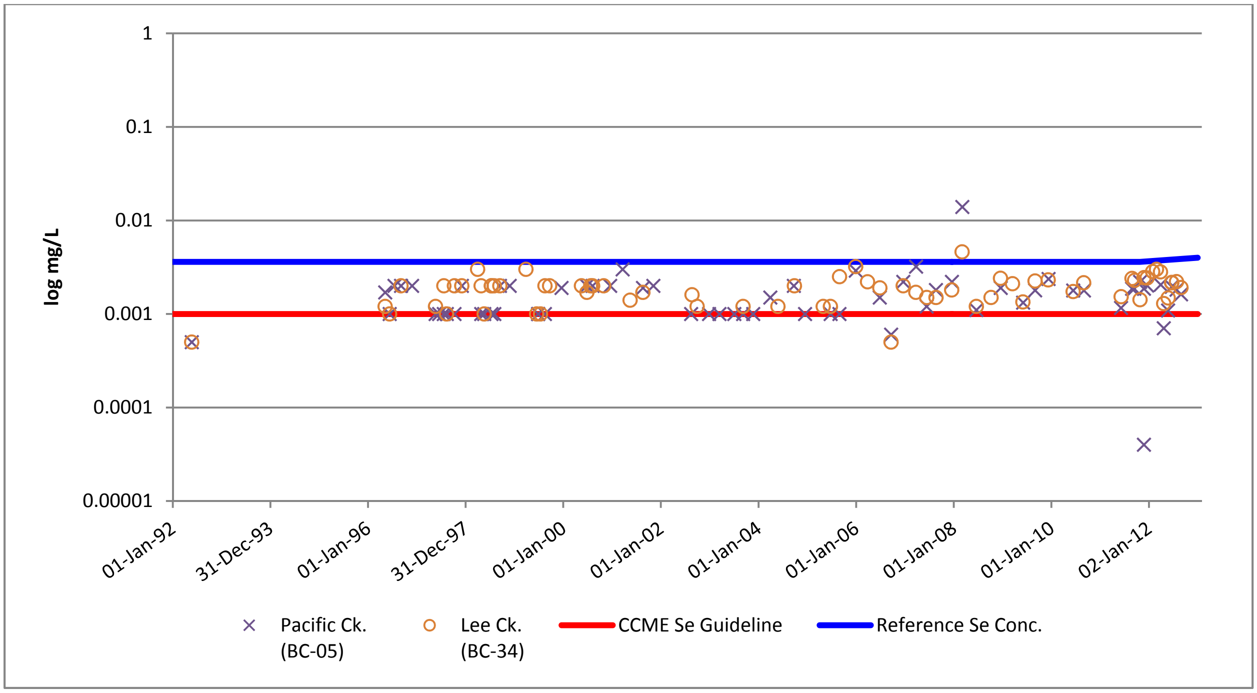


Figure 3-4 Total Selenium Concentrations, 1992 – 2012, Pacific and Lee Creeks

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 D/R periods (Figure 3-5). The mean at both station BC-05 (Pacific Creek receiver) and BC-34 (Lee Creek receiver) was less than the CCME guideline 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 (Figure 3-5). None of the results obtained in 2012 exceeded the CCME guideline for antimony in the downstream receiver on Lee Creek (BC-34).

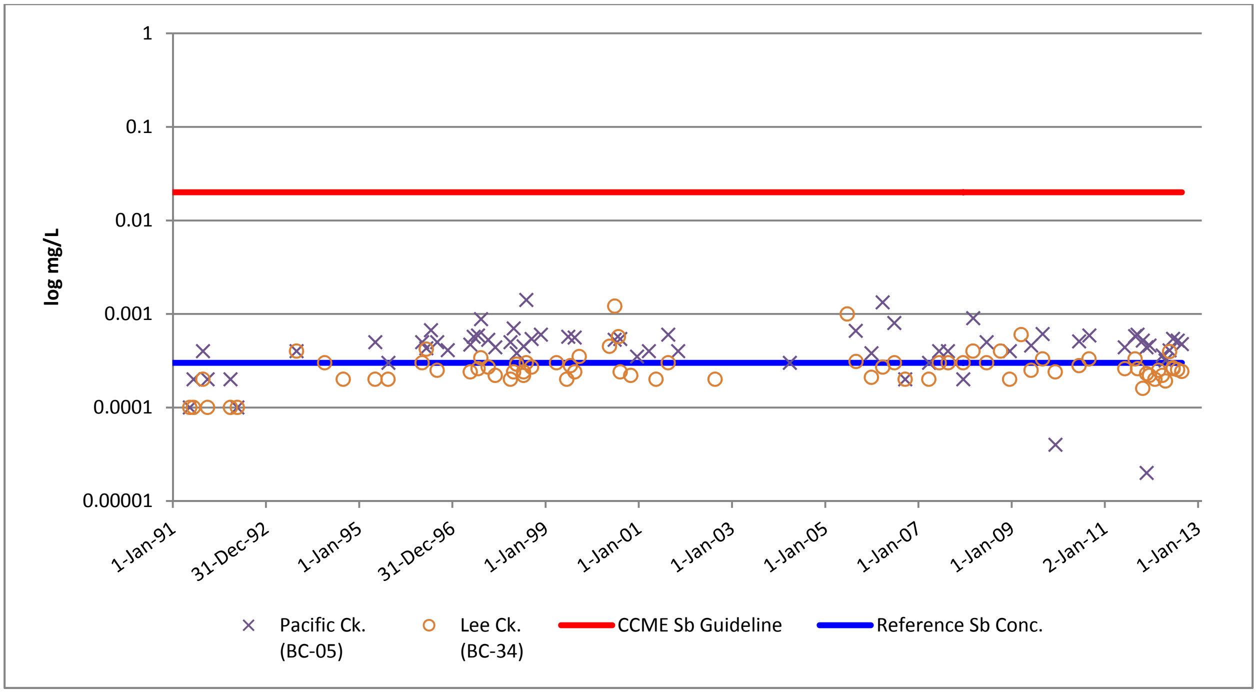


Figure 3-5 Total Antimony Concentrations, 1991 – 2012, Pacific and Lee Creeks

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. It was also primarily below reference in Lee Creek prior to mining, with rare exception (Figure 3-6). None of the results obtained in 2012 exceeded the CCME guideline for arsenic in the downstream receiver on Lee Creek (BC-34).

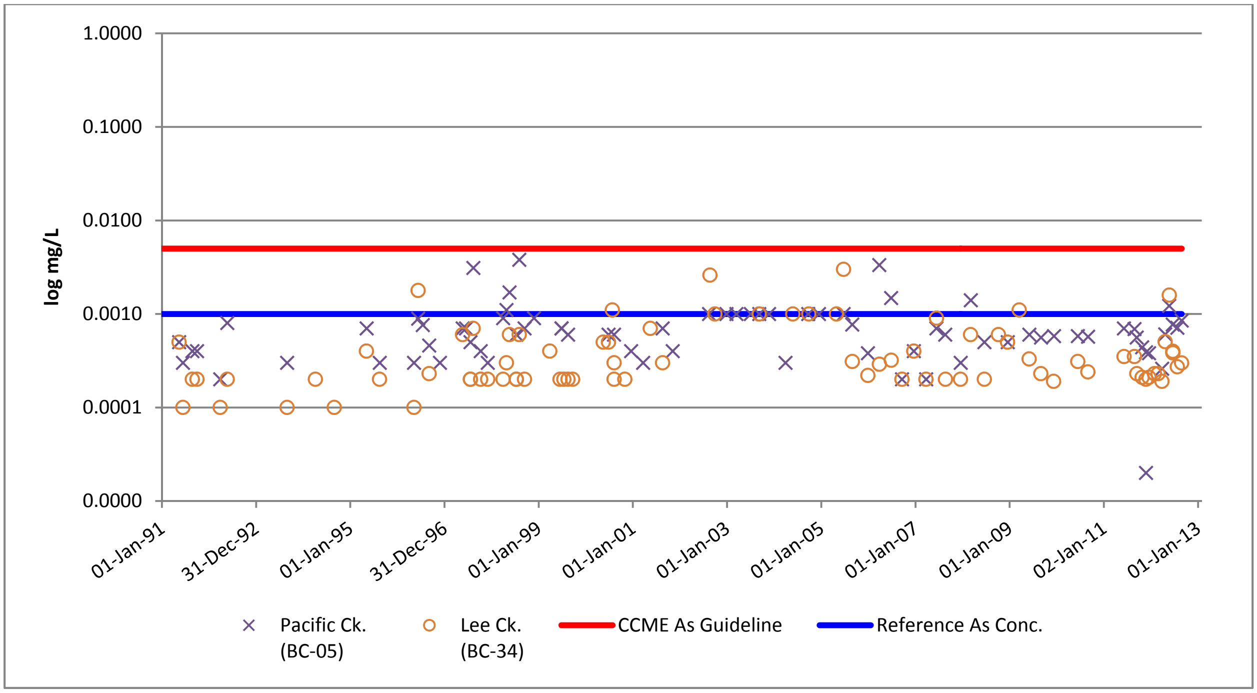


Figure 3-6 Total Arsenic Concentrations, 1991 – 2012, Pacific and Lee Creeks

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]

During the 2012 freshet sampling event, zinc and copper both exhibited concentrations in excess of the respective CCME guideline.

[2] *The CCME guideline for copper and zinc and the reference condition are roughly equal. This is also true for zinc.*

3.1.2.5 Observations: Nitrate (as Nitrogen)

Nitrate concentrations in Lee and Pacific Creeks were well below the CCME guideline (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 parameter 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 uptick in overall concentrations of nitrate on Lee Creek (Figure 3-7). None of the results obtained in 2012 exceeded the CCME guideline for nitrate in the downstream receiver on Lee Creek (BC-34).

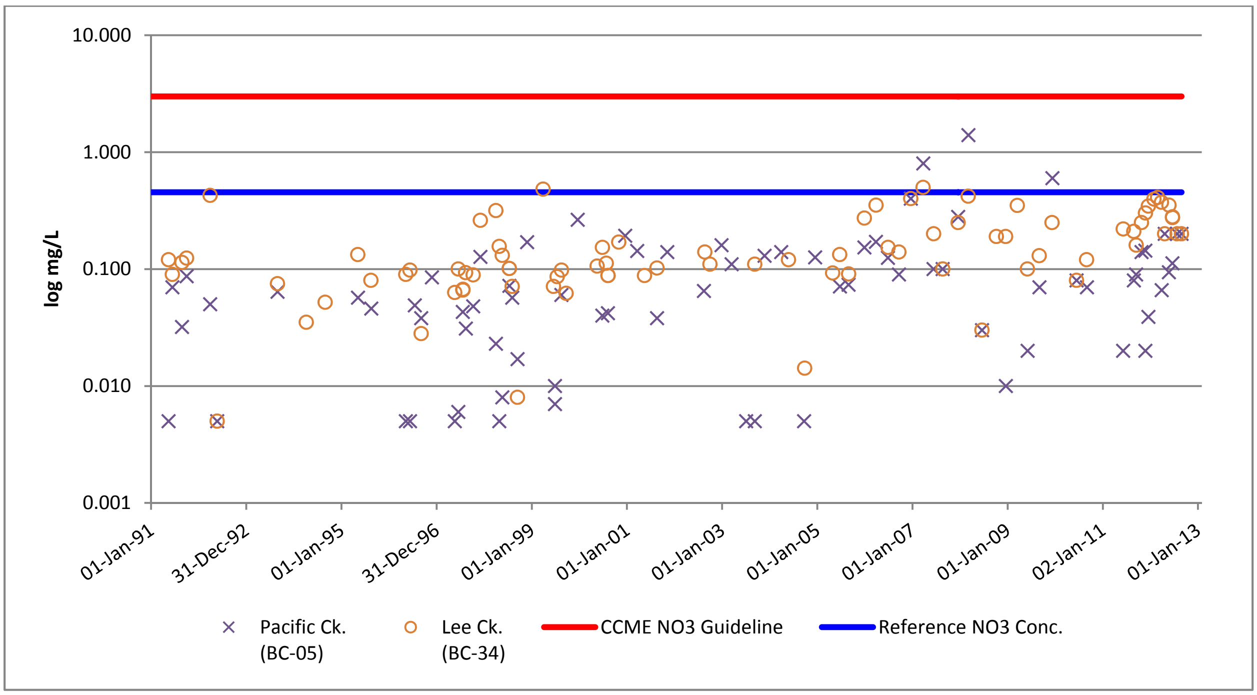


Figure 3-7 Nitrate as Nitrogen Concentrations, 1991 – 2012, Pacific and Lee Creeks

3.1.2.6 Conditions during Production and Decommissioning/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 obtained over the course of the mine life 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 2012. 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 (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 (Table 3-3). 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 (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 4 times the typical MDL. A Practical Quantitative Limit (PQL) of 5 times the MDL is considered prudent in assessing water quality results, although a PQL of 3 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 SSWQS for selenium in 53% 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 SSWQS, 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 SSWQS, 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 SSWQS for this area.

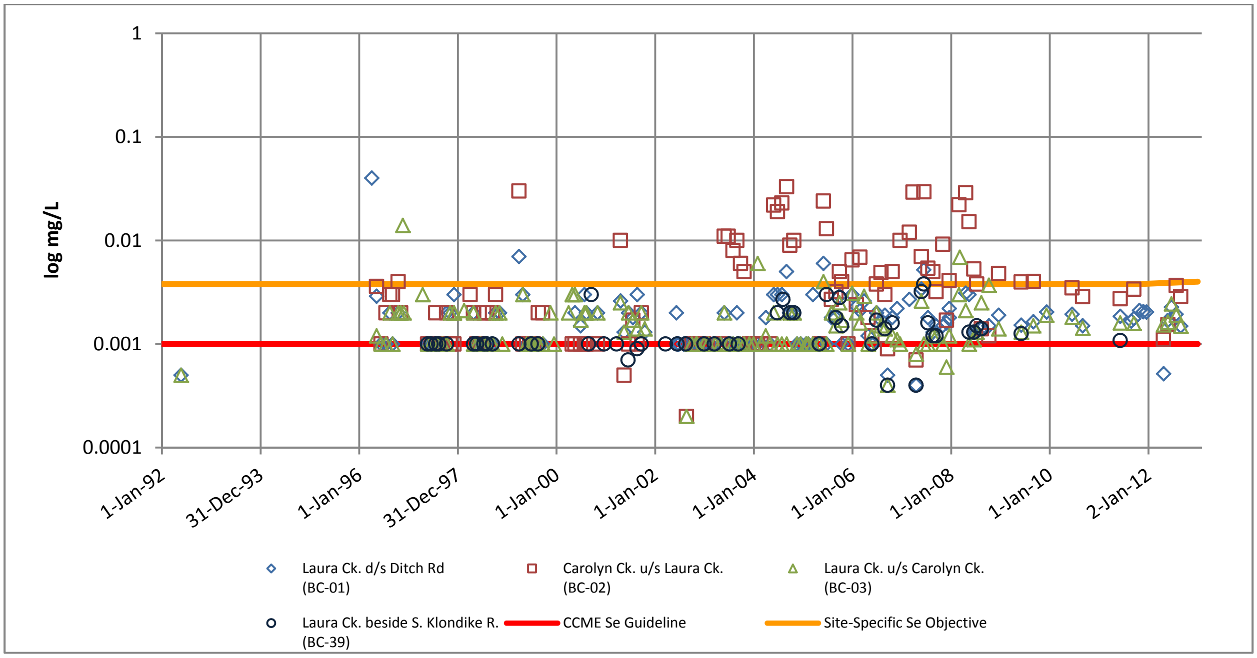


Figure 3-8 Total Selenium Concentrations, 1992 – 2012, Laura and Carolyn Creeks

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 did exceed the CCME guideline in many of the samples at all four stations analyzed (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 D/R than it did prior to mining. Even at BC-39, which is a compliance point with respect to CCME guidelines, arsenic exceeded the guideline 5% of the time during mining, and 19% of the time during decommissioning and reclamation (Appendix B).

Arsenic is considered a contaminant of concern in the Laura Creek and Carolyn Creek watersheds as a result of the increases observed during the past mining and decommissioning and reclamation phases.

[3] *A pooled reference dataset may produce a more robust background benchmark for the Laura Creek watershed, as noted in Section* ***Error! Reference source not found.****).*

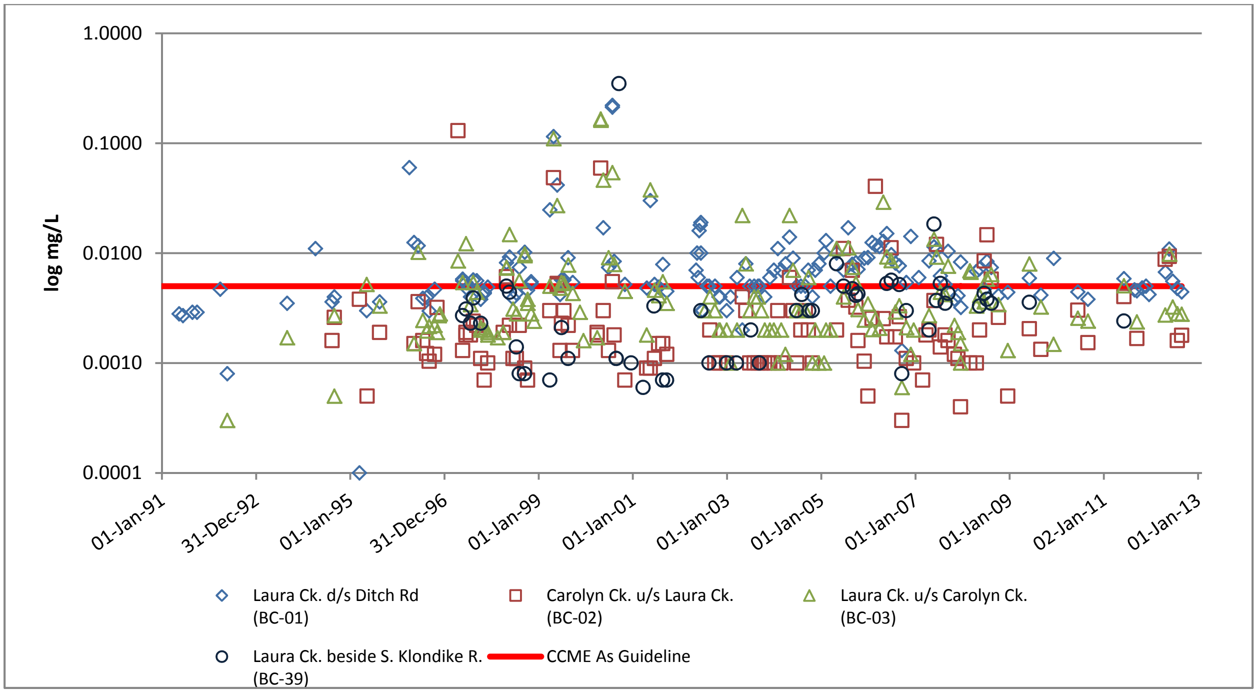


Figure 3-9 Total Arsenic Concentrations, 1991 – 2012, Laura and Carolyn Creeks

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. At no site and during no period did zinc exceed the guideline in >50% of samples, although the guideline was exceeded >10% of the time in Laura Creek at station BC-03 during mining, and at Carolyn Creek during decommissioning and reclamation (Appendix B).

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, this concept cannot be confirmed or denied.

The zinc results do not indicate that zinc is, or has become as a result of mining, a problem in the Laura Creek/Carolyn Creek watershed.

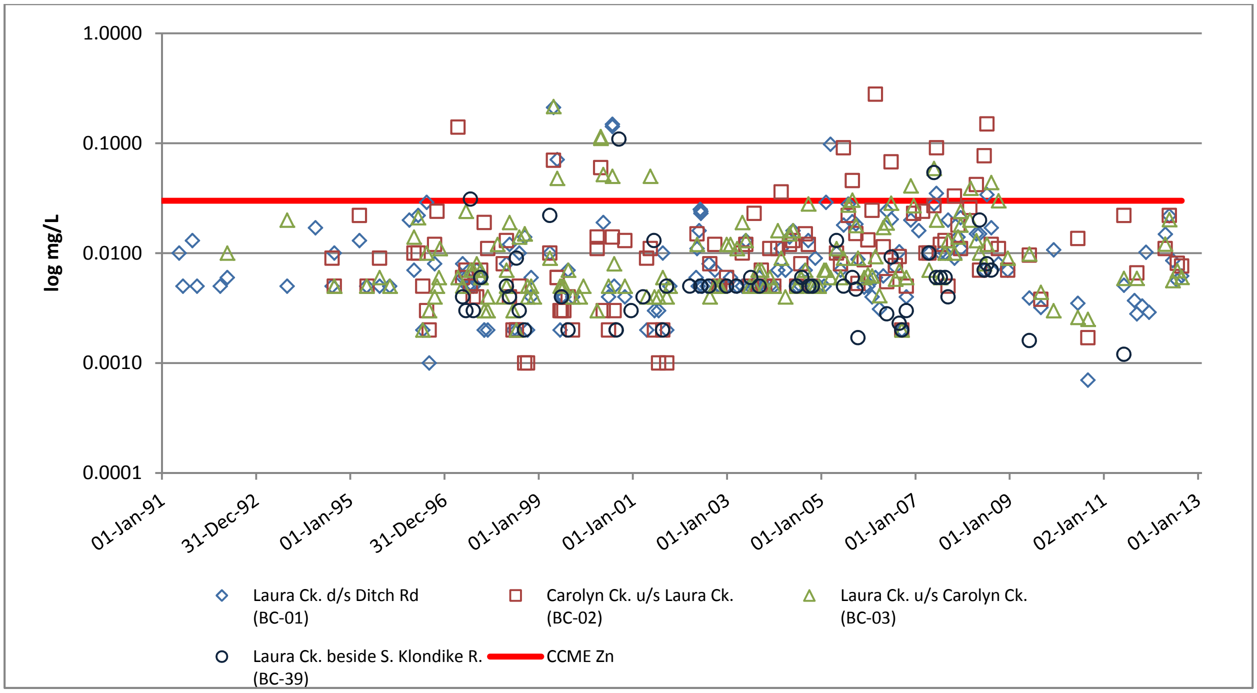


Figure 3-10 Total Zinc Concentrations, 1991 – 2012, Laura and Carolyn Creeks

3.1.3.4 Observations: Copper

Copper results show variation about the CCME guideline, but do not exhibit any specific trend (Figure 3-11). In 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.

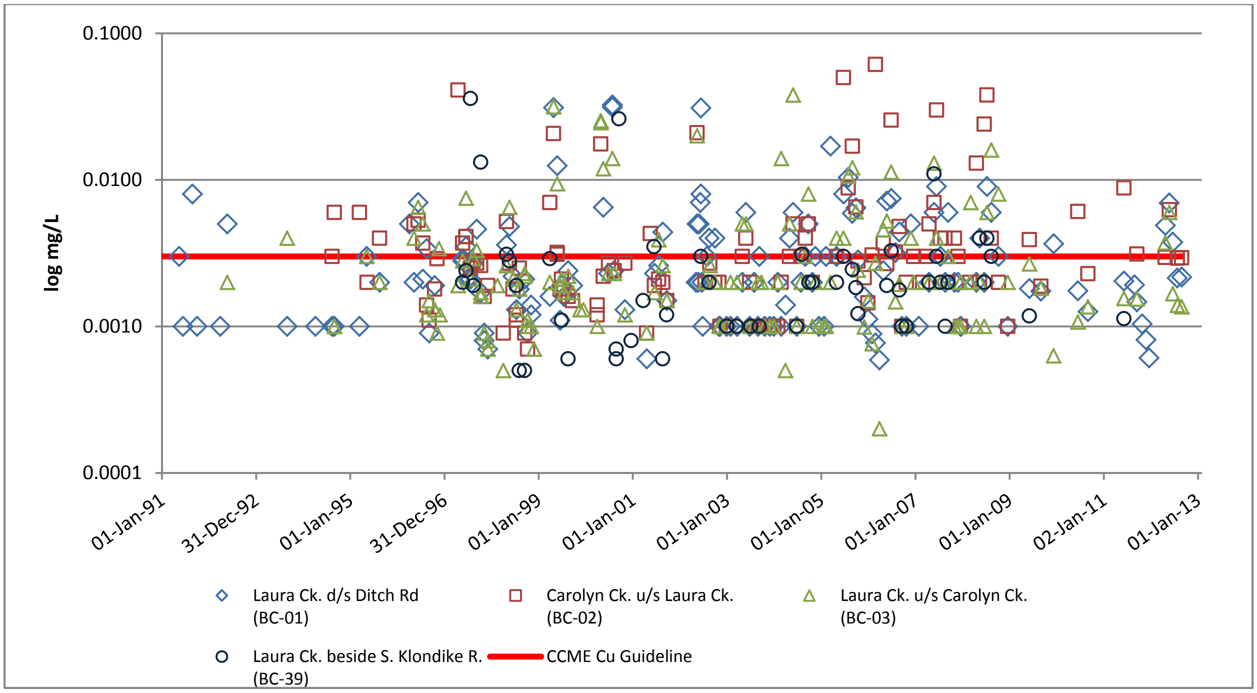


Figure 3-11 Total Copper Concentrations, 1991 – 2012, Laura and Carolyn Creeks

3.1.3.5 Observations: Antimony and Lead

Antimony and lead were notable in that they did not exceed CCME guidelines at any station during any phase in a significant way (<10% exceed rate).

3.1.3.6 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. Figure 3-12 shows 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.*

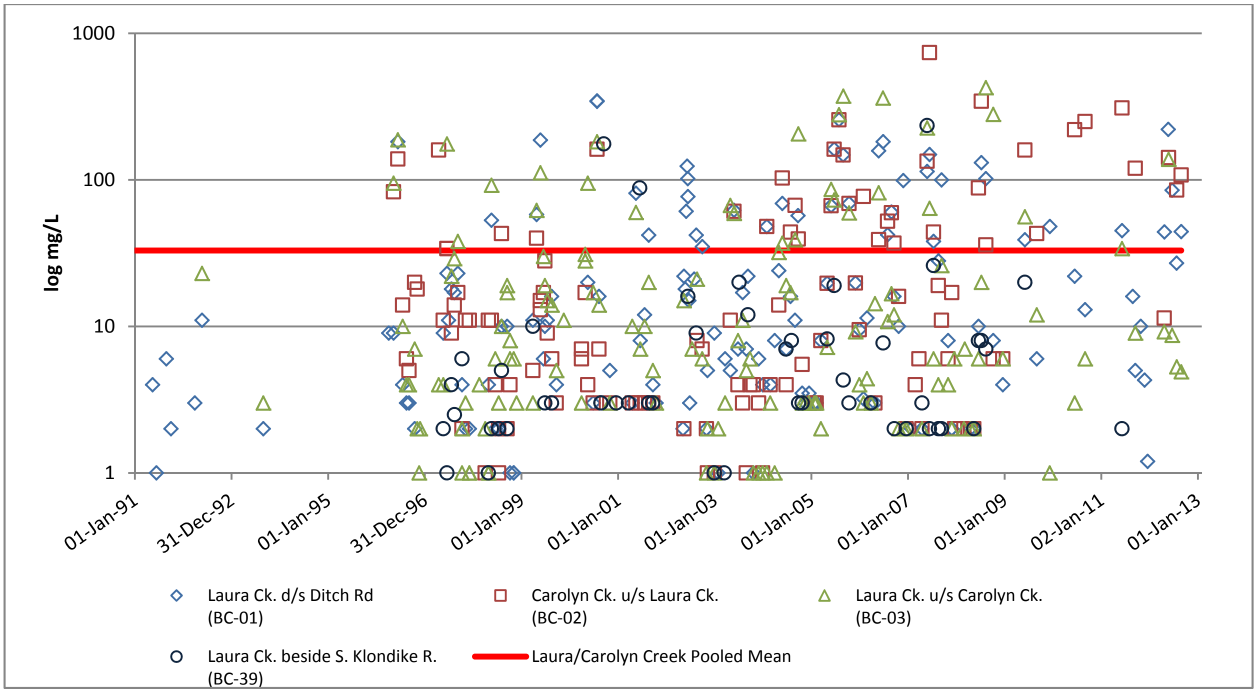


Figure 3-12 Total Suspended Solids Concentrations, 1991 – 2012, Laura and Carolyn Creeks

3.1.3.7 Observations: Nitrate

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-transpirative 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 a profound impact on surface waters as nutrients dissolve into runoff and are carried into the downstream environment, and could be a source of nitrates in Carolyn and Laura Creek.

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.

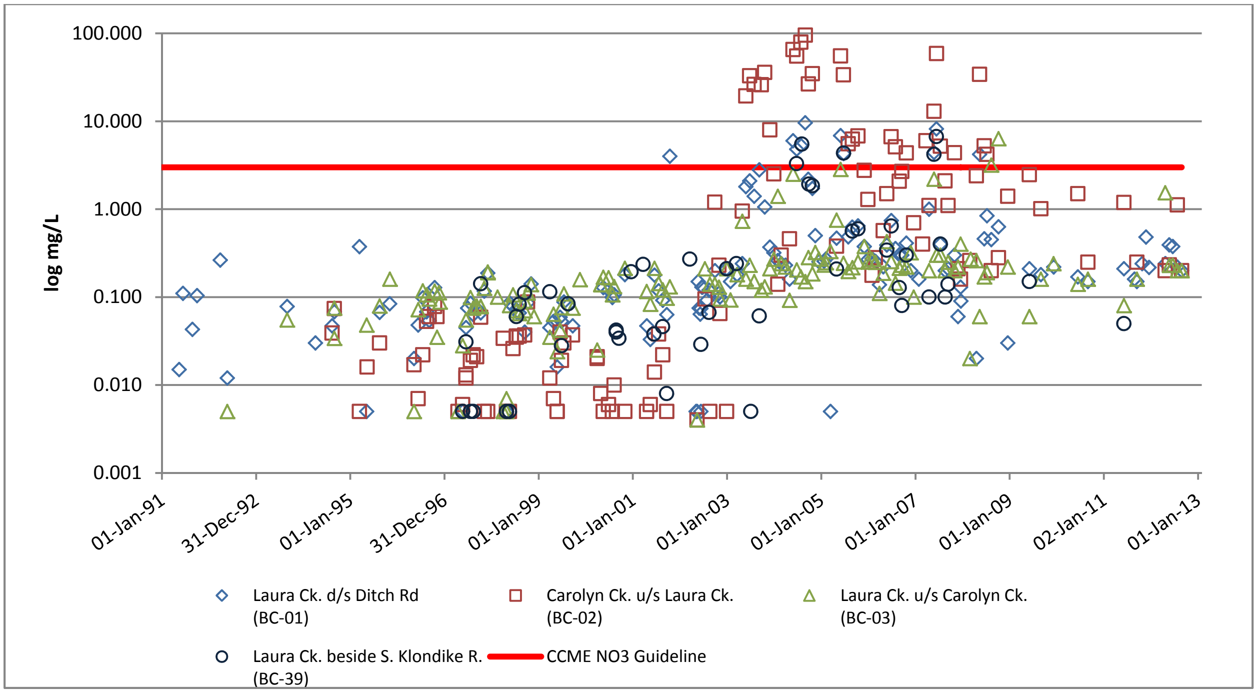


Figure 3-13 Nitrate as Nitrogen Concentrations, 1991 – 2012, Laura and Carolyn Creeks

3.1.3.8 Conditions during Production and Decommissioning/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 SSWQS 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 are 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 D.

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 from 2000 – 2012. 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 (Figure 3-14).

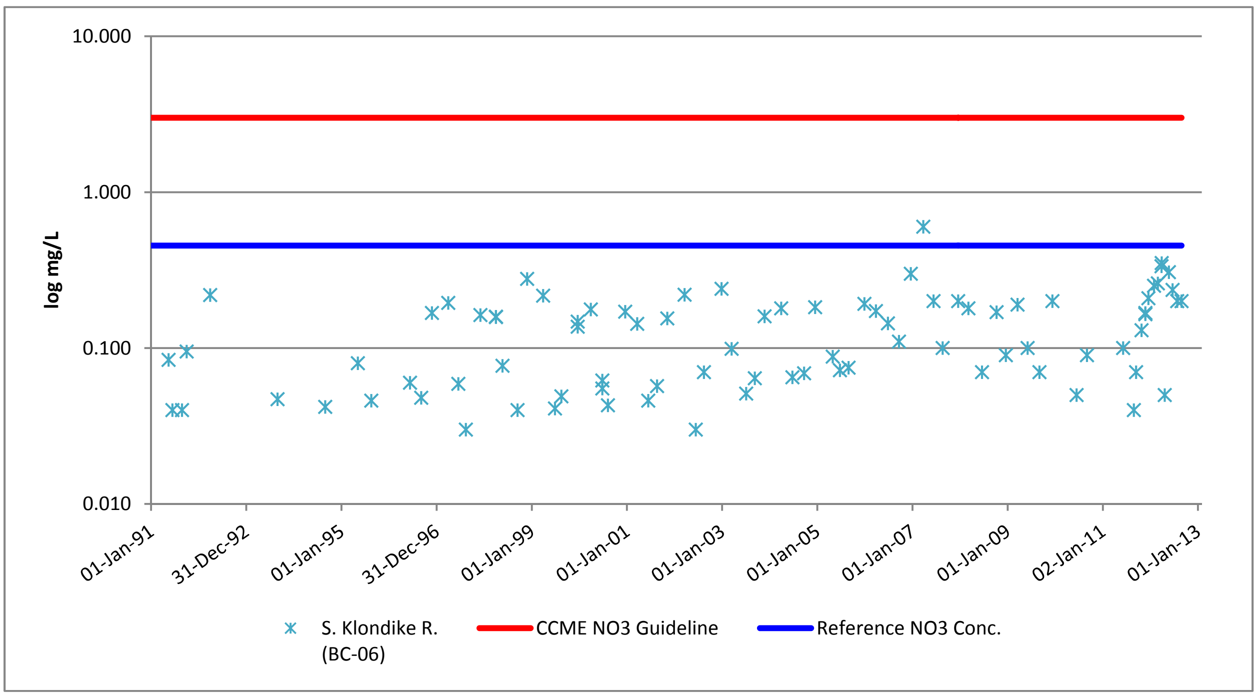


Figure 3-14 Nitrate as Nitrogen Concentrations, 1991 – 2012, South Klondike River

Additional parameters antimony, selenium, arsenic, zinc, copper, lead, and total suspended solids are presented graphically in Appendix A for 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 conducted shortly following freshet, in June, and again in September 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.

Water quality sampling from groundwater stations is required on a twice a year basis as per the Water Licence. There are 7 groundwater piezometers and 1 deep groundwater well (BC-23) located down gradient of the heap leach pad. It is important to note that some of these stations are dry and therefore no samples are obtained. Station BC-20 contains only ice year-round. This station historically collected water but at some point during sampling became permanently frozen. Attempts are made each site visit to collect a sample and the condition of the well is noted.

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 metals, total and WAD cyanide, nitrate or ammonia. Data are presented graphically in Appendix C.

3.2.2 Land Application Area Groundwater Monitoring

Monitoring at station BC-65 showed no sign of increasing or decreasing trends for metals, total and WAD cyanide, nitrate or ammonia. All results were in compliance with respect to Clause 43 of Water Licence QZ96-007. No data were collected at station BC-66 in 2012.

Data are presented graphically in Appendix C.

3.2.3 Blue WRSA Groundwater Monitoring

Monitoring at stations BC-67 and BC-69 showed no sign of increasing or decreasing trends for metals, total and WAD cyanide, nitrate or ammonia. Monitoring was not carried out at Blue WRSA stations BC-68 and BC-70 during 2012. Attempts to sample these locations will continue in future years. Data are presented graphically in Appendix C.

3.3 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.

One in-pit samples was collected from the following pits during 2012:

- BC-10: Kokanee Pit and Dump
- BC-12: Blue Pit
- BC-15: Moosehead Pit
- BC-17 Golden Pit and Dump
- 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.
- Samples collected from the Kokanee Phase 3 and Golden pits (BC-10 and BC-17 respectively), show no abnormal values.
- The Blue Pit (BC-12) exhibited lower pH during the 2012 sampling than in previous years, returning a value of 4.85 in June. Sampling here should be increased to confirm the potential for ARD development and metal leaching potential.
- Previous years' sampling in Moosehead (BC-15) showed higher levels of selenium. This trend reversed beginning in 2009, and selenium levels in Moosehead from 2009-2012 continued below 0.05 mg/L, with a result of 0.132 mg/L in June 2012.
- The Upper Fosters (BC-9), Moosehead West and East Pits (BC-13 and -14), and the Lucky Pit (BC-18) were dry during scheduled sampling events.
- Overall, the results of pit water sampling indicate no upward trends from previous years.

3.4 HEAP DISCHARGE

During 2012, no water was discharged to the receiving environment from the heap either via direct discharge or land application. Heap discharge was activated temporarily for samples to be collected, and then immediately discontinued following sample collection.

3.5 BLUE WASTE ROCK STORAGE AREA WATER QUALITY ASSESSMENT

3.5.1 Purpose and Study Objectives

Mining at Brewery Creek consisted primarily of oxide-type ores with low potential for acid generation due to the prior removal of sulphide minerals by natural weathering processes. The exception was the Blue Zone which occurred in partially oxidized graphitic shales containing sulphide minerals.

In response to concerns raised by the regulatory agencies that approximately 1.1 million tonnes of waste rock generated from the Blue Zone is a current or potential source of acidic and/or metal-bearing water that could cause downstream impact to Laura Creek if not mitigated, an evapotranspiration soil cover was designed and constructed over the Blue WRSA to reduce infiltration. The cover was placed in 2003. In the same year, SRK Consulting was retained to:

- re-evaluate the available geochemical data for the Blue Waste Rock Storage Area (WRSA);
- estimate if the Blue WRSA could be a source of acid drainage; and
- predict the possible impacts of water originating from the Blue WRSA on Laura Creek at BC-1 and the South Klondike River at BC-6.

The last task culminated in the development of downstream water quality predictions for Laura Creek and the South Klondike River. A Blue Zone Monitoring and Assessment Program was designed and completed by VMC in 2005 to assess a number of components of the Blue Zone, among which were the geochemical stability of the waste rock and the quality of surrounding surface and groundwater. The monitoring program committed to revisiting those predictions made by SRK in 2003 to assess the overall effectiveness of remedial measures on surface water and determine if additional measures need to be implemented.

This chapter compares the water quality results collected from Laura Creek at BC-1 and the South Klondike River at BC-6 with the SRK predictions and provides discussion on the degree to which water quality predictions are being met.

3.5.2 SRK Downstream Surface Water Quality Predictions

The findings of the work SRK completed in 2003 on the acid generation potential of the Blue WRSA showed that overall, waste rock was geochemically stable during the time of their assessment and that conditions at that time could be used to accurately predict future behaviour of the waste rock and pore water chemistry, and from that downstream water chemistry.

Two scenarios of acid generation potential were used to model downstream water quality parameters. The first approach (Approach A), used the assumption that all of the annual production of soluble contaminant is leached each year, and that all of the waste rock is flushed by infiltration. The second approach (Approach B) used a higher water volume to obtain lower water concentrations for comparison with Approach A. The result was that the waste rock pore water chemistry modeled in Approach A was estimated to be greater than that of Approach B by a factor of roughly 25. Because Approach A represents a scenario in which all leachable contamination is flushed, it was determined to be a reasonable worst case.

The results of pore water chemistry modeling were then combined with groundwater chemistry observed at monitoring wells BC-67, -68 and -69 in a mixing model. The final step involved a dilution calculation to mix seepage from the Blue WRSA with Laura Creek discharge.

Downstream water quality was predicted for each of the two approaches described above and for each of the three conditions: winter low flow, spring freshet and summer flow. Downstream surface water quality predictions for BC-1 and BC-6 are summarized in Table 3-4.

3.5.3 Results and Discussion

Water quality results are compared against predictions in the following sections. A comprehensive comparison of flow water quality results against predicted concentrations can be found in Table 3-5. Where water chemistry predictions differ, results are compared against the more conservative (i.e. lower water quality) predictions of Approach B. Where water quality results do not exceed predicted values of a given parameter, they are not discussed.

Water quality results are generally thought to meet predictions where results range closely on either side of the predicted concentration. Copper and arsenic were the two primary contaminants of concern during the environmental assessment and licensing phase of the Brewery Creek decommissioning and closure plan. Additional graphical summaries are presented for copper and arsenic in the discussion of the performance results.

3.5.3.1 Winter Low Flow Condition

In general, winter low flow conditions did not exceed the predicted water quality concentrations developed by SRK with any regularity for any parameters, with the exception of manganese. Manganese results were in excess of the predicted water quality under both prediction approaches during all sampling events except for one (Table 3-5). This indicates that the predicted water quality for manganese as formulated by SRK is not representative of real-world conditions. It should be noted that results for manganese were shown to be less than the British Columbia Water Quality Guideline (BCWQG) of 1.3 mg/L for all samples.

3.5.3.2 Spring Flow Condition

Results obtained during spring freshet conditions were variable with respect to the SRK water quality predictions. Notably, both selenium and dissolved sulphate exceeded the predicted water quality under both prediction approaches during all sampling events (Table 3-6). Selenium was also in excess of the CCME guidelines on all occasions.

3.5.3.3 Summer Flow Condition

Results obtained during summer flow conditions were similarly variable with respect to the SRK water quality predictions as that seen during spring freshet. Both selenium and dissolved sulphate exceeded the predicted water quality under both prediction approaches during most sampling events carried out during 2012 (Table 3-7). Selenium was also in excess of the CCME guidelines on all occasions.

3.5.4 Conclusion

Results for most parameters are either commensurate with or below predicted water quality concentrations from SRK's 2003 work. Selenium is the only parameter showing results that are consistently marginally higher than both the predicted water quality and CCME guidelines.

Table 3-4 Water Quality Predictions at BC-1 and BC-6 (SRK 2003)

		Total Aluminum	Total Antimony	Total Arsenic	Total Cadmium	Total Copper	Total Iron	Total Manganese	Total Mercury	Total Selenium	Dissolved SO_4	Total Zinc
Winter Flow Conditions												
Approach "A"												
	BC-1	0.08	0.03	0.008	0.002	0.04	0.1	0.1	0.00004	0.001	172	0.01
	BC-6	0.01	0.0012	0.001	0.0002	0.001	0.05	0.002	0.00002	0.001	76	0.005
Approach "B"												
	BC-1	0.08	0.0041	0.005	0.0003	0.003	0.1	0.04	0.00002	0.001	165	0.0077
	BC-6	0.006	0.001	0.001	0.0002	0.001	0.05	0.002	0.00002	0.001	76	0.005
Spring Flow Conditions												
Approach "A"												
	BC-1	1.17	0.01	0.01	0	0.03	1.8	0.1	0.00003	0.001	37	0.02
	BC-6	0.25	0.001	0	0.0002	0.002	0.4	0.014	0.00002	0.001	29	0.005
Approach "B"												
	BC-1	1.2	0.0051	0.01	0.0003	0.03	1.8	0.0867	0.00003	0.001	37	0.02
	BC-6	0.3	0.001	0.001	0.0002	0.002	0.4	0.0143	0.00002	0.001	29	0.01
Summer Flow Conditions												
Approach "A"												
	BC-1	0.6	0.01	0.01	0	0.01	1.3	0	0	0.001	63	0.01
	BC-6	0.17	0.0011	0	0.0002	0.008	0.3	0.021	0.0002	0.001	42	0.008
Approach "B"												
	BC-1	0.6	0.0051	0.005	0.0002	0.004	1.3	0.05	0.00002	0.001	62	0.008
	BC-6	0.17	0.001	0.001	0.0002	0.008	0.3	0.02	0.0002	0.001	42	0.008

Table 3-5 Water Quality Results Relative to Predictions at BC-1 and BC-6, Winter Flow Condition

		Total Aluminum	Total Antimony	Total Arsenic	Total Cadmium	Total Copper	Total Iron	Total Manganese	Total Mercury	Total Selenium	Dissolved SO_4	Total Zinc
Approach "A" - Winter Flow Conditions												
Predicted @ BC-1		***0.08***	***0.03***	***0.008***	***0.002***	***0.04***	***0.1***	***0.1***	***0.00004***	***0.001***	***172***	***0.01***
Observed @ BC-1	23-Apr-2012	0.848	0.00172	0.00672	0.000176	0.00489	1.83	0.0865	<0.00001	0.000516	20	0.0149
	27-Nov-2012	0.051	0.00226	0.00375	0.000054	0.000785	0.148	0.103	<0.00001	0.00161	156	0.00343
Predicted @ BC-6		***0.01***	***0.0012***	***0.001***	***0.0002***	***0.001***	***0.05***	***0.002***	***0.00002***	***0.001***	***76***	***0.005***
Observed @ BC-6	30-Jan-2012	0.0047	0.00015	0.0005	0.000036	0.00035	0.015	0.00505	<0.00001	0.0009	75	0.0019
	28-Feb-2012	0.0032	0.00017	0.00047	0.000042	0.00039	0.014	0.00451	<0.00001	0.00116	87	0.0025
	28-Mar-2012	0.0029	0.00023	0.00023	0.000111	0.00056	0.011	0.00379	<0.00001	0.00263	160	0.0074
	21-Apr-2012	0.0551	0.000176	0.00119	0.0000616	0.000986	0.122	0.0198	<0.00001	0.000759	67	0.00435
	17-Dec-2012	0.00224	0.000148	0.000256	0.000029	0.000311	0.0079	0.00389	<0.00001	0.000703	66	0.00153
Approach "B" - Winter Flow Conditions												
Predicted @ BC-1		***0.08***	***0.0041***	***0.005***	***0.0003***	***0.003***	***0.1***	***0.04***	***0.00002***	***0.001***	***165***	***0.0077***
Observed @ BC-1	23-Apr-2012	0.848	0.00172	0.00672	0.000176	0.00489	1.83	0.0865	<0.00001	0.000516	20	0.0149
	27-Nov-2012	0.051	0.00226	0.00375	0.000054	0.000785	0.148	0.103	<0.00001	0.00161	156	0.00343
Predicted @ BC-6		***0.006***	***0.001***	***0.001***	***0.0002***	***0.001***	***0.05***	***0.002***	***0.00002***	***0.001***	***76***	***0.005***
Observed @ BC-6	30-Jan-2012	0.0047	0.00015	0.0005	0.000036	0.00035	0.015	0.00505	<0.00001	0.0009	75	0.0019
	28-Feb-2012	0.0032	0.00017	0.00047	0.000042	0.00039	0.014	0.00451	<0.00001	0.00116	87	0.0025
	28-Mar-2012	0.0029	0.00023	0.00023	0.000111	0.00056	0.011	0.00379	<0.00001	0.00263	160	0.0074
	21-Apr-2012	0.0551	0.000176	0.00119	0.0000616	0.000986	0.122	0.0198	<0.00001	0.000759	67	0.00435
	17-Dec-2012	0.00224	0.000148	0.000256	0.000029	0.000311	0.0079	0.00389	<0.00001	0.000703	66	0.00153

Table 3-6 Water Quality Results Relative to Predictions at BC-1 and BC-6, Spring Flow Condition

		Total Aluminum	Total Antimony	Total Arsenic	Total Cadmium	Total Copper	Total Iron	Total Manganese	Total Mercury	Total Selenium	Dissolved SO_4	Total Zinc
Approach "A" - Spring Flow Conditions												
Predicted @ BC-1		***1.17***	***0.01***	***0.01***	***0.000***	***0.03***	***1.8***	***0.1***	***0.00003***	***0.0010***	***37***	***0.02***
Observed @ BC-1	22-May-2012	0.979	0.00253	0.0109	0.000329	0.00696	2.65	0.265	nm*	0.00168	49	0.0219
	19-Jun-2012	0.496	0.00335	0.00556	0.000107	0.00376	1.14	0.0738	nm*	0.00227	84	0.00856
Predicted @ BC-6		***0.25***	***0.0010***	***0.00***	***0.0002***	***0.002***	***0.4***	***0.014***	***0.00002***	***0.0010***	***29***	***0.005***
Observed @ BC-6	23-May-2012	0.301	0.000348	0.000883	0.000325	0.00436	0.732	0.0573	nm*	0.00146	50	0.0253
	20-Jun-2012	0.0718	0.000254	0.000334	0.0000958	0.00146	0.119	0.00976	nm*	0.00199	74	0.00665
Approach "B' - Spring Flow Conditions												
Predicted @ BC-1		***1.2***	***0.0051***	***0.01***	***0.0003***	***0.03***	***1.8***	***0.0867***	***0.00003***	***0.0010***	***37***	***0.02***
Observed @ BC-1	22-May-2012	0.979	0.00253	0.0109	0.000329	0.00696	2.65	0.265	nm*	0.00168	49	0.0219
	19-Jun-2012	0.496	0.00335	0.00556	0.000107	0.00376	1.14	0.0738	nm*	0.00227	84	0.00856
Predicted @ BC-6		***0.3***	***0.0010***	***0.0010***	***0.0002***	***0.002***	***0.4***	***0.0143***	***0.00002***	***0.0010***	***29***	***0.01***
Observed @ BC-6	23-May-2012	0.301	0.000348	0.000883	0.000325	0.00436	0.732	0.0573	nm*	0.00146	50	0.0253
	20-Jun-2012	0.0718	0.000254	0.000334	0.0000958	0.00146	0.119	0.00976	nm*	0.00199	74	0.00665

*Not measured

Table 3-7 Water Quality Results Relative to Predictions at BC-1 and BC-6, Summer Flow Condition

		Total Aluminum	Total Antimony	Total Arsenic	Total Cadmium	Total Copper	Total Iron	Total Manganese	Total Mercury	Total Selenium	Dissolved SO_4	Total Zinc
Approach "A" - Summer Flow Conditions												
Predicted @ BC-1		***0.60***	***0.01***	***0.01***	***-***	***0.01***	***1.3***		***0.0000***	***0.001***	***63***	***0.01***
Observed @ BC-1	24-Jul-2012	0.237	0.00325	0.00478	0.000068	0.00214	0.577	0.0536	<0.00001	0.00194	92	0.00565
	28-Aug-2012	0.309	0.00239	0.00444	0.000058	0.00217	0.78	0.0674	<0.00001	0.00149	103	0.0062
	18-Sep-2012	0.0412	0.00268	0.00393	0.000024	0.000988	0.149	0.0507	<0.00001	0.00191	119	0.00196
	18-Oct-2012	0.0316	0.0027	0.00438	0.00002	0.000809	0.113	0.0417	<0.00001	0.00219	133	0.00169
Predicted @ BC-6		***0.17***	***0.0011***	***-***	***0.0002***	***0.008***	***0.3***	***0.021***	***0.0002***	***0.001***	***42***	***0.008***
Observed @ BC-6	25-Jul-2012	0.0234	0.00019	0.000708	0.000029	0.00067	0.0518	0.00767	<0.00001	0.000553	43	0.00211
	28-Aug-2012	0.0152	0.000219	0.000377	0.000065	0.000932	0.0579	0.0086	<0.00001	0.00161	92	0.00439
	18-Sep-2012	0.0167	0.000182	0.000378	0.000331	0.00166	0.0459	0.0108	<0.00001	0.00115	84	0.0157
	18-Oct-2012	0.00447	0.000164	0.000288	0.000029	0.000264	0.0195	0.00366	<0.00001	0.00091	62	0.00136
Approach "B" – Summer Flow Conditions												
Predicted @ BC-1		***0.60***	***0.0051***	***0.005***	***0.0002***	***0.004***	***1.3***	***0.05***	***0.00002***	***0.001***	***62***	***0.008***
Observed @ BC-1	24-Jul-2012	0.237	0.00325	0.00478	0.000068	0.00214	0.577	0.0536	<0.00001	0.00194	92	0.00565
	28-Aug-2012	0.309	0.00239	0.00444	0.000058	0.00217	0.78	0.0674	<0.00001	0.00149	103	0.0062
	18-Sep-2012	0.0412	0.00268	0.00393	0.000024	0.000988	0.149	0.0507	<0.00001	0.00191	119	0.00196
	18-Oct-2012	0.0316	0.0027	0.00438	0.00002	0.000809	0.113	0.0417	<0.00001	0.00219	133	0.00169
Predicted @ BC-6		***0.17***	***0.0010***	***0.0010***	***0.0002***	***0.008***	***0.3***	***0.02***	***0.0002***	***0.001***	***42***	***0.008***
Observed @ BC-6	25-Jul-2012	0.0234	0.00019	0.000708	0.000029	0.00067	0.0518	0.00767	<0.00001	0.000553	43	0.00211
	28-Aug-2012	0.0152	0.000219	0.000377	0.000065	0.000932	0.0579	0.0086	<0.00001	0.00161	92	0.00439
	18-Sep-2012	0.0167	0.000182	0.000378	0.000331	0.00166	0.0459	0.0108	<0.00001	0.00115	84	0.0157
	18-Oct-2012	0.00447	0.000164	0.000288	0.000029	0.000264	0.0195	0.00366	<0.00001	0.00091	62	0.00136

4 REFERENCES

Canadian Council of the Ministers of the Environment, 2012. *Canadian Water Quality Guidelines for the Protection of Aquatic Life*.

Ontario Ministry of Environment and Energy, 1994. *Policies, Guidelines Provincial Water Quality Objective of the Ministry of Environment and Energy (Ontario)*.

British Columbia Ministry of Environment. 2006. *British Columbia Approved Water Quality Guidelines 2006 Edition*. Updated August 2006

SRK Consulting, 2003. *Geochemical Assessment, Blue Waste Rock Storage Area, Brewery Creek Mine*.

APPENDIX A

WATER LICENCE QZ96-007 WATER QUALITY MONITORING SCHEDULES

SCHEDULE A
MONITORING STATIONS

Station	Description	UTM Coordinates (Zone 7)	
		Northing (m)	Easting(m)
BC-01, H5, W5, B3	Laura Creek, 50m upstream from Ditch Road	7,099,630	634,420
BC-02, H15, W15	Carolyn Creek, upstream from Laura Creek	7,101,970	633,250
BC-03, 2, W4B	Laura Creek above Carolyn Creek	7,102,570	632,345
BC-04, H13, W13, B7	Lucky Creek, downstream from Lucky Pit	7,107,640	639,180
BC-05	Pacific Creek, upstream from confluence with Lee Creek	7,103,130	627,610
BC-06, K1, W9, B5	South Klondike downstream from confluence with Lee Creek	7,097,460	627,400
BC-10	Kokanee Pit and Dump	7,105,760	635,620
BC-11	Blue Waste Dump	7,105,050	633,740
BC-12	Blue Pit	7,105,420	634,090
BC-15	Moosehead Pit discharge	7,106,430	634,420
BC-16	Pacific Gulch – 300m above Laura	7,105,140	633,350
BC-17	Golden Pit and Dump	7,106,510	637,560
BC-18S	Lucky Pit and Dump –South End	7,107,220	638,160
BC-18N	Lucky Pit and Dump –North End	7,107,410	638,160
BC-19	Piezometer RC94-843	7,103,750	632,290
BC-21	Piezometer RC95-1354	7,105,070	632,740
BC-22	Piezometer RC95-1357	7,104,000	632,066
BC-27	Piezometer RC97-2026	7,106,550	637,380
BC-28	Far (South) End of Overflow Pond	7,103,899	632,578
BC-28a	Discharge from Heap	7,104,144	632,369
BC-28b	Far (South) End of Biological Treatment Cell	7,104,033	632,424
BC-39	Laura Creek 50m upstream of the South Klondike River	7,098,230	631,340
BC-51W	Pacific Pit –west side	7,105,240	633,130
BC-53	Laura Creek Wetland 100m downstream of Ditch Road	7,099,729	633,750
BC-65	Land Application Piezometer	7,102,140	633,990
BC-66	Land Application Piezometer	7,100,660	634,710
BC-67	Blue WRSA Piezometer	7,105,280	633,710
BC-68	Blue WRSA Piezometer	7,105,310	633,920
BC-69	Blue WRSA Piezometer	7,105,150	633,820
BC-70	Blue WRSA Test Cover Lysimeter		
H2, W2, B2, BC-31	Golden Creek above confluence with S. Klondike	7,104,030	642,340
H3, W3, BC-32	Laura Creek below Exploration Camp	7,105,100	634,170
H6, W6A, B6, BC-33	Lee Creek above Pacific Creek	7,103,240	627,420
H7, W7, B1, BC-34	Lee Creek at Ditch Road	7,100,380	627,710
He, W14, BC-35	Pacific Creek below heap leach pad	7,106,010	630,650
H16, W16, BC-36	Golden Creek above confluence with Lucky Creek	7,109,860	640,500
H17, W5A, BC-37	Laura Creek at Ditch Road	7,099,700	633,960
K4, W8, B4, BC-38	S. Klondike upstream from confluence with Golden Creek	7,102,670	642,250

SCHEDULE B-2
MONITORING SCHEDULE (2010 to 2014)

	MONITORING STATION																														
Parameter	BC 1	BC 2	BC 3	BC 4	BC 5	BC 6	BC 10	BC 11	BC 12	BC 15	BC 16	BC 17	BC 18	BC 19	BC 21	BC 22	BC 27	BC 28	BC 28a	BC 28b	BC 31	BC 34	BC 39	BC 51W	BC 53	BC 65	BC 66	BC 67	BC 68	BC 69	BC 70
Flow[1]	SA	SA	SA	SA	SA		SA	SA	SA	SA	SA	SA	SA	(2)	(2)	(2)	(2)		SA		SA	SA	SA	SA	SA	SA	(2)	(2)	(2)	(2)	
pH (field)	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	MA/SA	MA/SA	A	A	A	SA
pH (laboratory)	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA				SA	SA	SA	SA	SA	MA/SA	MA/SA	A	A	A	SA
Conductivity (field)	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	MA/SA	MA/SA	A	A	A	SA
Conductivity (lab)	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA				SA	SA	SA	SA	SA	MA/SA	MA/SA	A	A	A	SA
Temperature (field)	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA								SA	SA	SA	SA	SA	MA/SA	MA/SA	A	A	A	SA
Hardness	SA	SA	SA	SA	SA																				SA						SA
Alkalinity	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA				SA	SA	SA	SA	SA	MA/SA	MA/SA	A	A	A	SA
Dissolved Solids	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA				SA	SA	SA	SA	SA			A	A	A	SA
Suspended Solids	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA					SA	SA	SA	SA	SA	SA	SA	SA	MA/SA	MA/SA				
Chloride	SA	SA	SA	SA	SA	SA								SA	SA	SA	SA								SA			A	A	A	
Sulphate	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA				SA	SA	SA	SA	SA	MA/SA	MA/SA	A	A	A	SA
Ammonia	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	MA/SA	MA/SA	A	A	A	SA
Nitrate	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA				SA	SA	SA	SA	SA	MA/SA	MA/SA	A	A	A	SA
Total cyanide	SA	SA				SA								SA	SA	SA	SA	SA	SA	SA					SA	MA/SA	MA/SA	A	A	A	
WAD cyanide	SA	SA				SA								SA	SA	SA	SA	SA	SA	SA					SA	MA/SA	MA/SA	A	A	A	
ICP metals	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	SA	MA/SA	MA/SA	A	A	A	SA
Bio-assay																		SA	SA	SA											

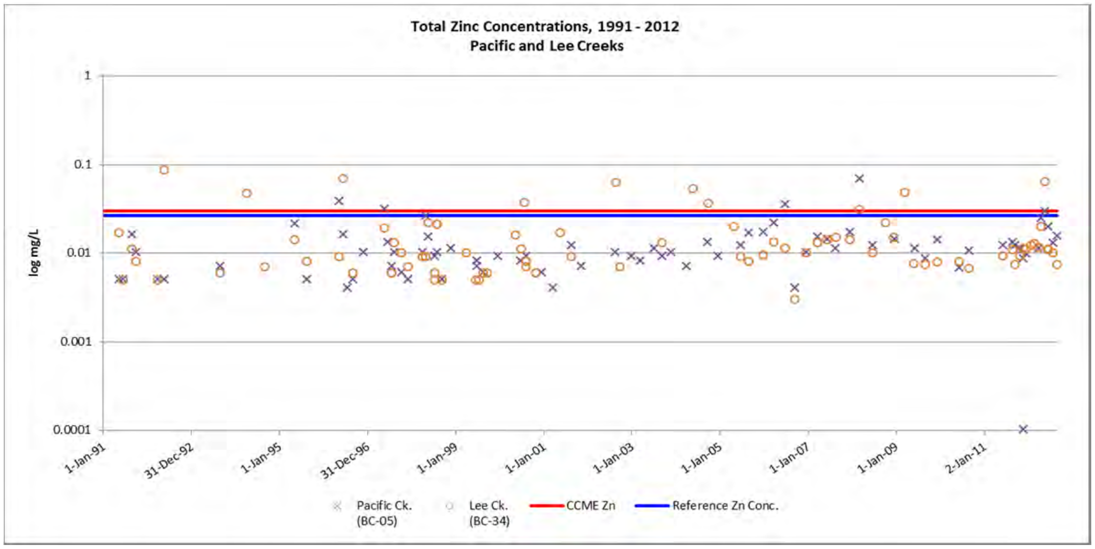
- ICP metals to include: Ca, Mg, Ba, K, Cu, As, Sb, Hg, Zn, Se, Pb, Al, Bi, Cd, Cr, Fe, Mn, Mo, Ni, Ag and S
- BC-18 includes BC-18S and BC-18N
- (2) denotes static water elevation

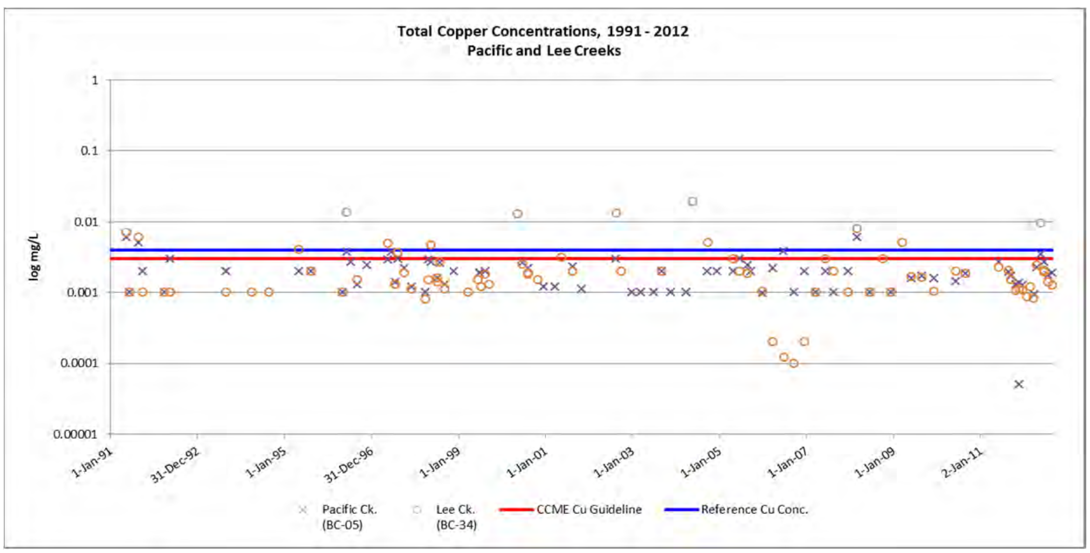
LEGEND

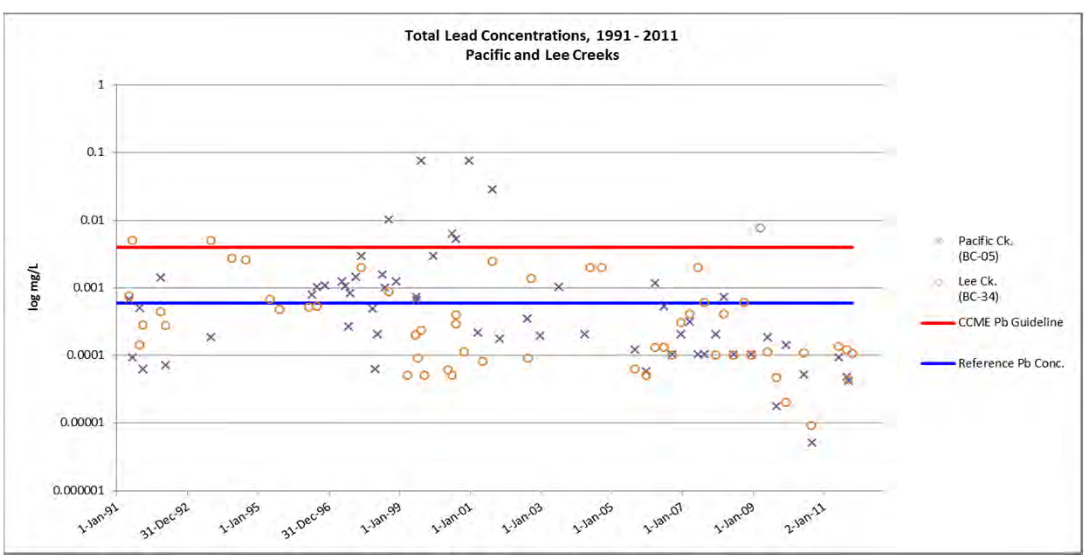
A = Annually
SA = Semi-Annually
MA/SA = Monthly when active and semi-annually when not actively discharging
[1] = Flows collected at all sites when it is safe and practical to do so

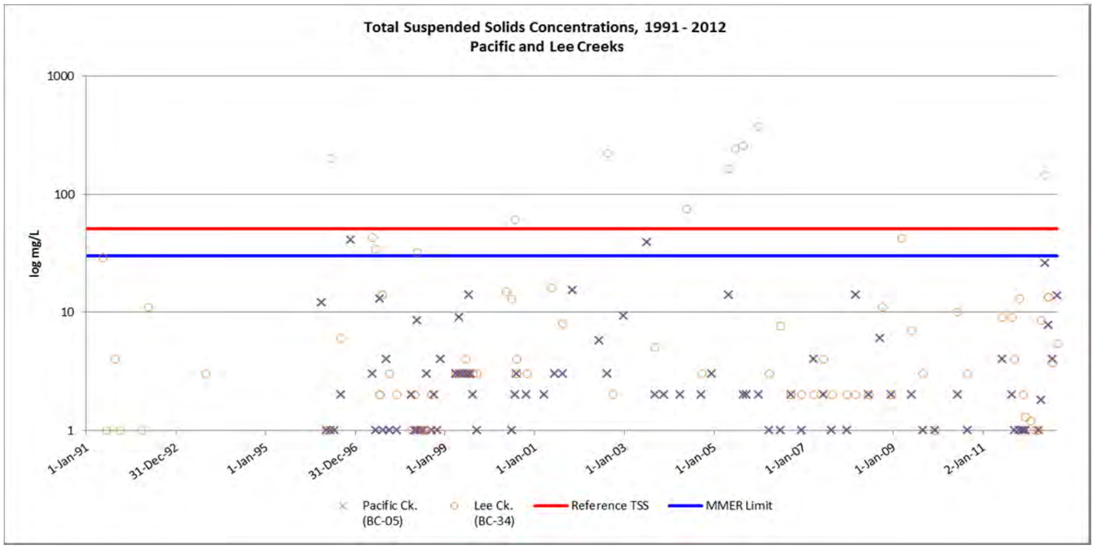
APPENDIX B

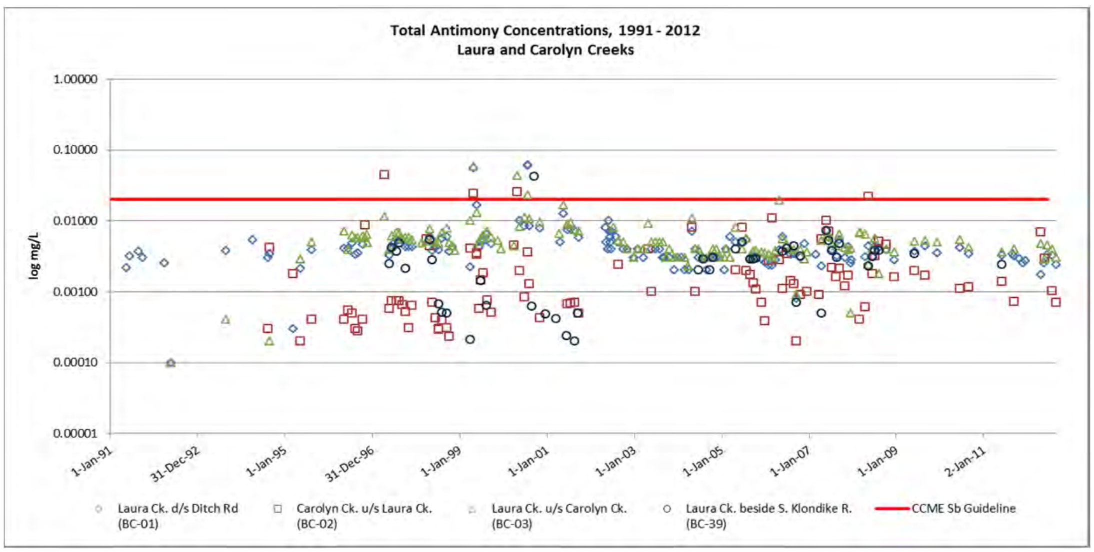
SURFACE WATER QUALITY STATIONS: GRAPHICAL DATA

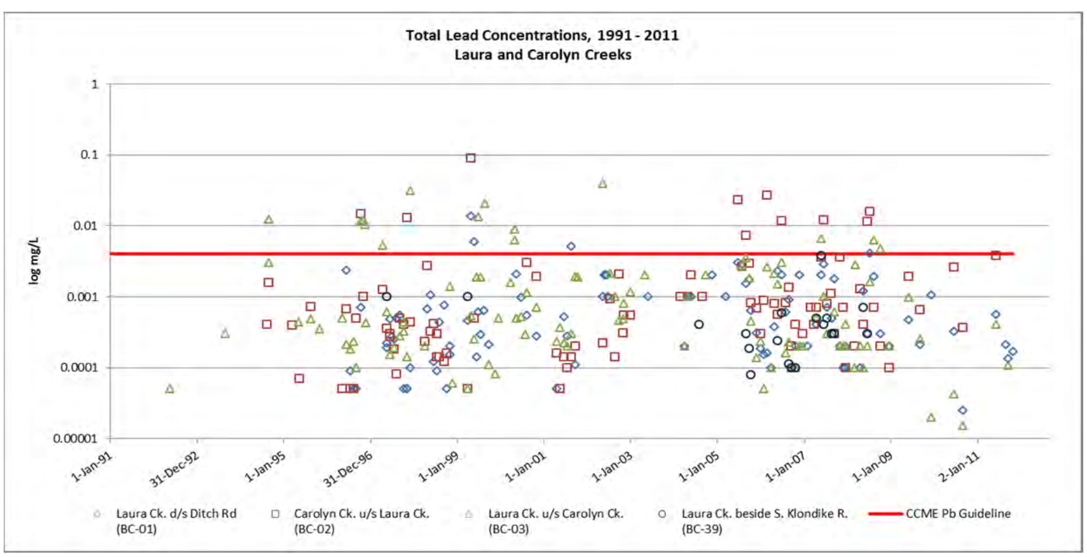

Total Zinc Concentrations, 1991 - 2012
Pacific and Lee Creeks
log mg/L
1
0.1
0.01
0.001
0.0001
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
Pacific Ck. (BC-05)
Lee Ck. (BC-34)
CCME Zn
Reference Zn Conc.

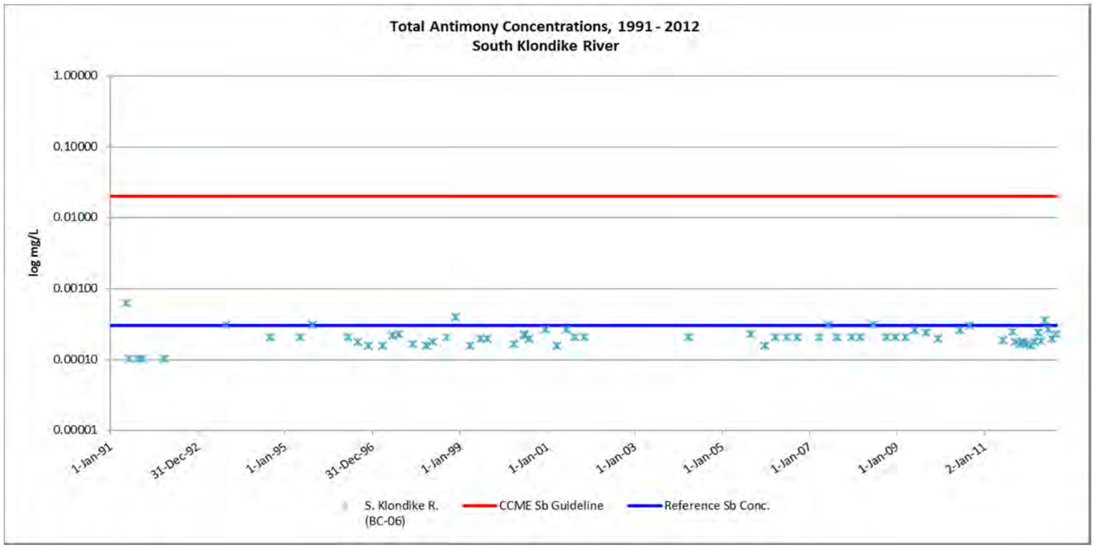

Total Copper Concentrations, 1991 - 2012
Pacific and Lee Creeks
log mg/L
1
0.1
0.01
0.001
0.0001
0.00001
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
Pacific Ck. (BC-05)
Lee Ck. (BC-34)
CCME Cu Guideline
Reference Cu Conc.

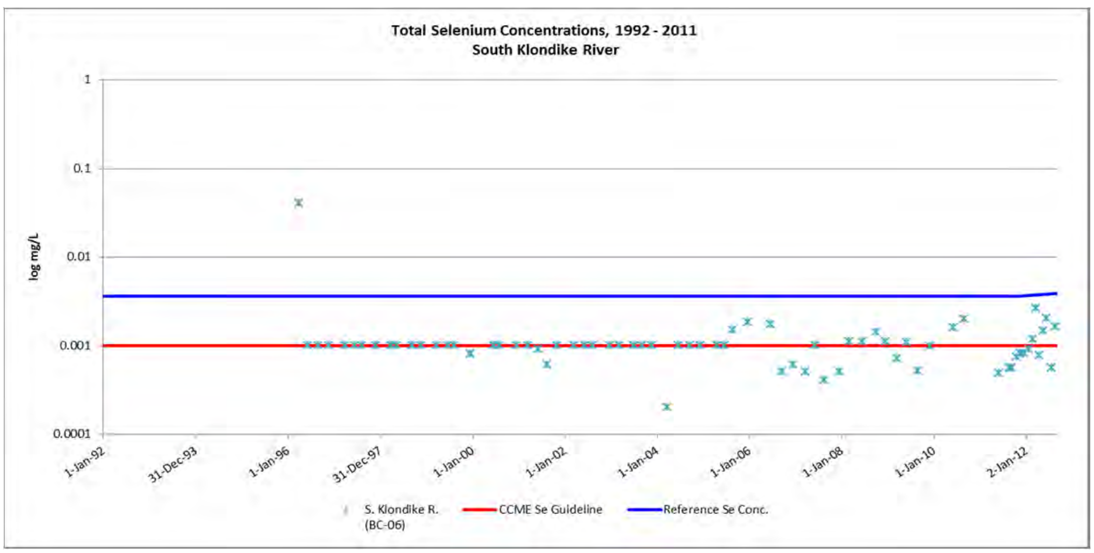

Total Lead Concentrations, 1991 - 2011
Pacific and Lee Creeks
log mg/L
1
0.1
0.01
0.001
0.0001
0.00001
0.000001
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
Pacific Ck. (BC-05)
Lee Ck. (BC-34)
CCME Pb Guideline
Reference Pb Conc.

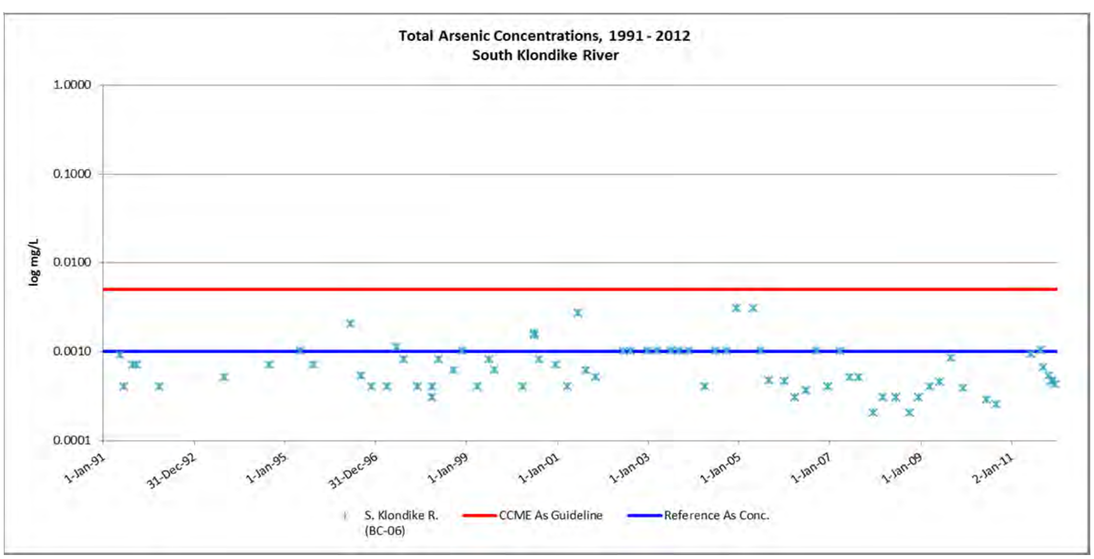

Total Suspended Solids Concentrations, 1991 - 2012
Pacific and Lee Creeks
log mg/L
1000
100
10
1
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
Pacific Ck. (BC-05)
Lee Ck. (BC-34)
Reference TSS
MMER Limit

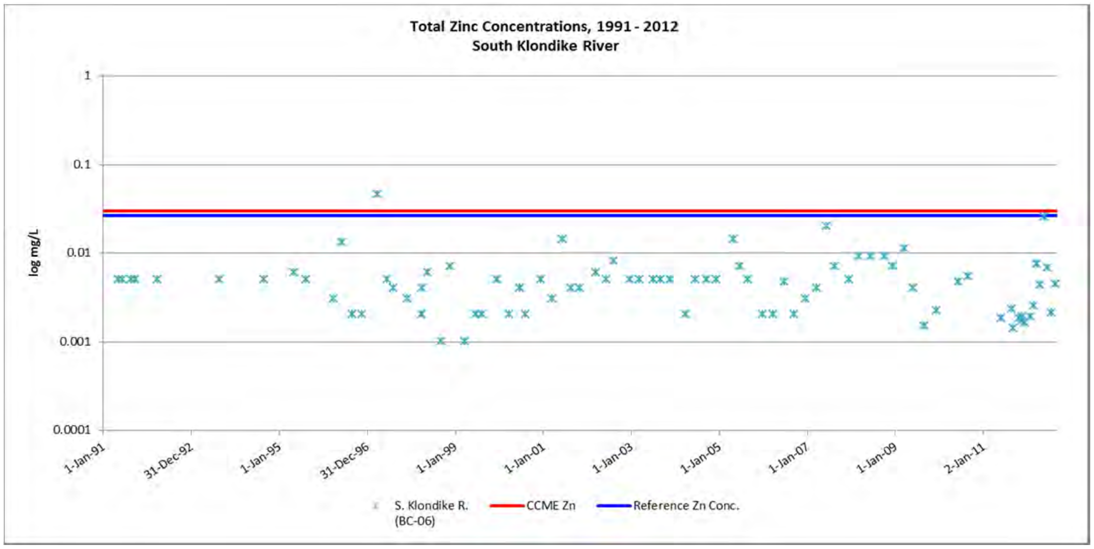

Total Antimony Concentrations, 1991 - 2012
Laura and Carolyn Creeks
log mg/L
1.00000
0.10000
0.01000
0.00100
0.00010
0.00001
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
Laura Ck. d/s Ditch Rd (BC-01)
Carolyn Ck. u/s Laura Ck. (BC-02)
Laura Ck. u/s Carolyn Ck. (BC-03)
Laura Ck. beside S. Klondike R. (BC-39)
CCME Sb Guideline

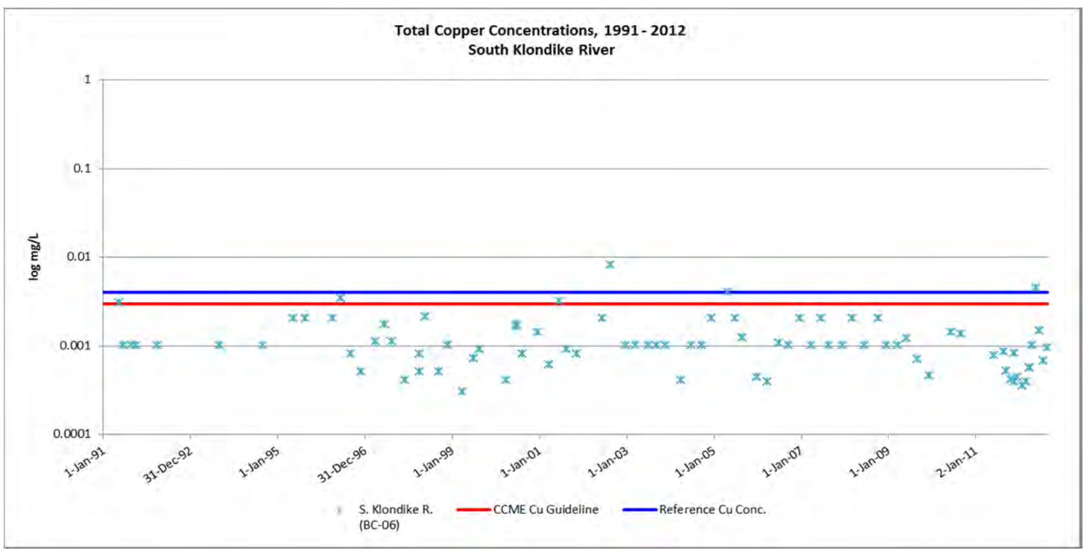

Total Lead Concentrations, 1991 - 2011
Laura and Carolyn Creeks
log mg/L
1
0.1
0.01
0.001
0.0001
0.00001
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
Laura Ck. d/s Ditch Rd (BC-01)
Carolyn Ck. u/s Laura Ck. (BC-02)
Laura Ck. u/s Carolyn Ck. (BC-03)
Laura Ck. beside S. Klondike R. (BC-39)
CCME Pb Guideline

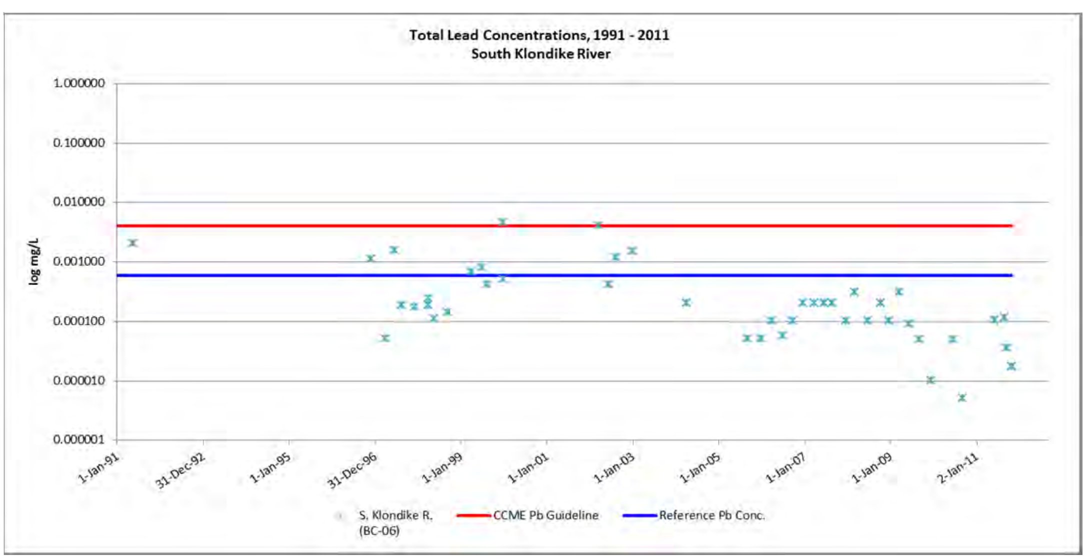

Total Antimony Concentrations, 1991 - 2012
South Klondike River
log mg/L
1.00000
0.10000
0.01000
0.00100
0.00010
0.00001
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
S. Klondike R. (BC-06)
CCME Sb Guideline
Reference Sb Conc.

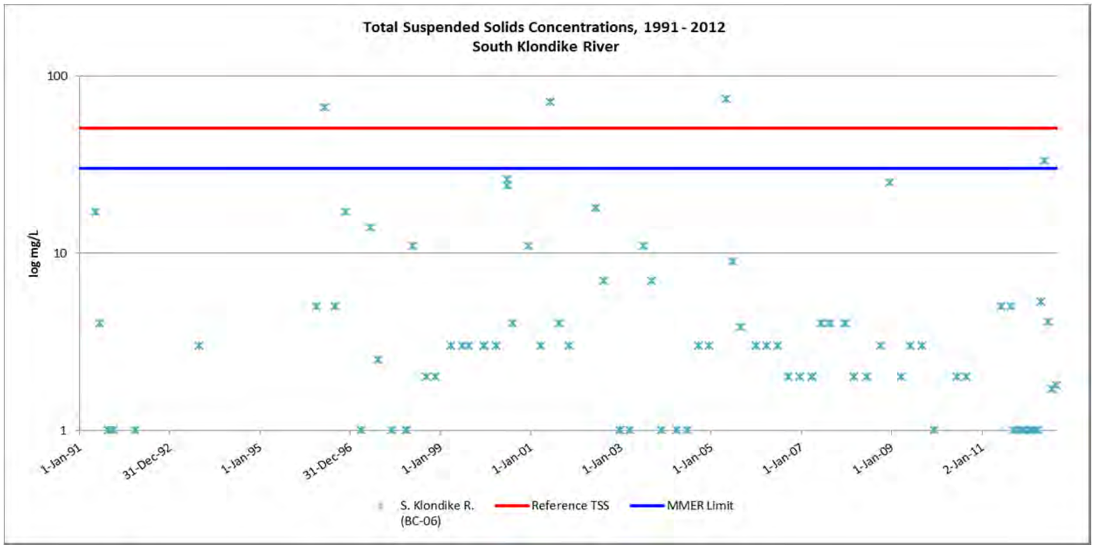

Total Selenium Concentrations, 1992 - 2011
South Klondike River
log mg/L
1
0.1
0.01
0.001
0.0001
1-Jan-92
31-Dec-93
1-Jan-96
31-Dec-97
1-Jan-00
1-Jan-02
1-Jan-04
1-Jan-06
1-Jan-08
1-Jan-10
2-Jan-12
S. Klondike R. (BC-06)
CCME Se Guideline
Reference Se Conc.

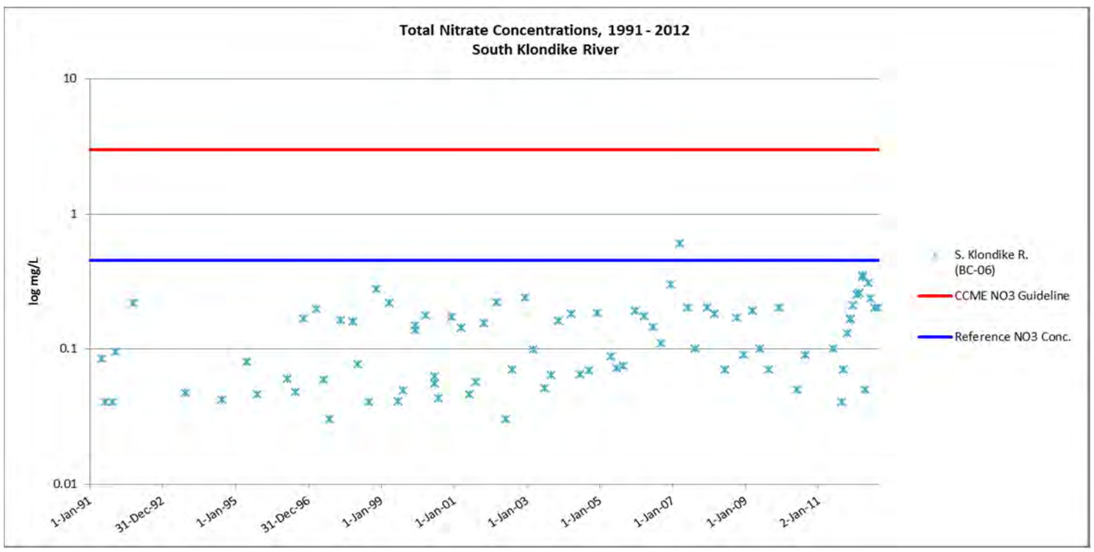

Total Arsenic Concentrations, 1991 - 2012
South Klondike River
log mg/L
1.0000
0.1000
0.0100
0.0010
0.0001
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
S. Klondike R. (BC-06)
CCME As Guideline
Reference As Conc.

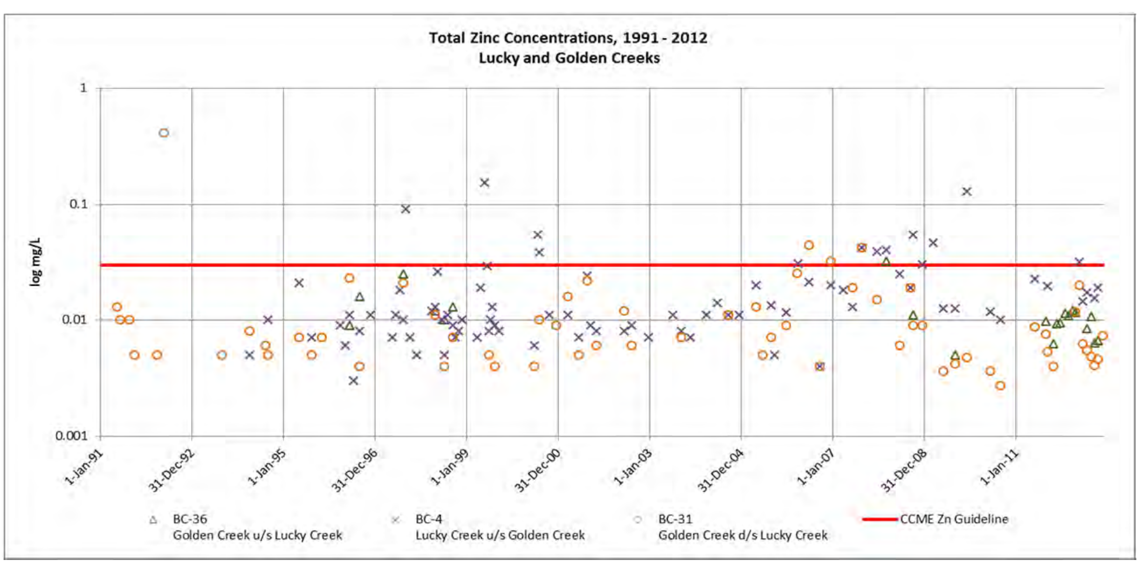

Total Zinc Concentrations, 1991 - 2012
South Klondike River
log mg/L
1
0.1
0.01
0.001
0.0001
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
S. Klondike R. (BC-06)
CCME Zn
Reference Zn Conc.

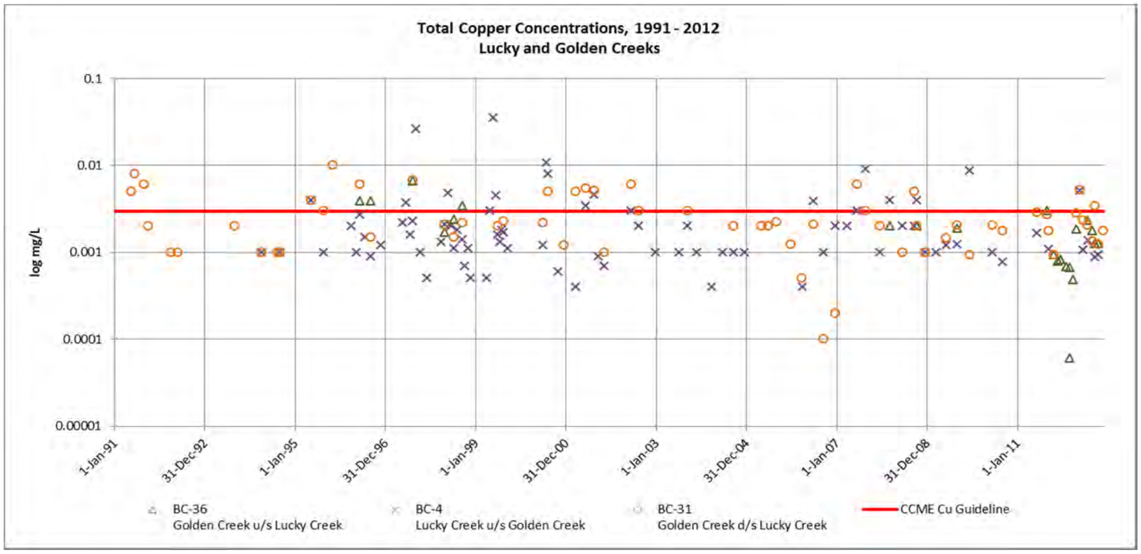

Total Copper Concentrations, 1991 - 2012
South Klondike River
log mg/L
1
0.1
0.01
0.001
0.0001
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
S. Klondike R. (BC-06)
CCME Cu Guideline
Reference Cu Conc.

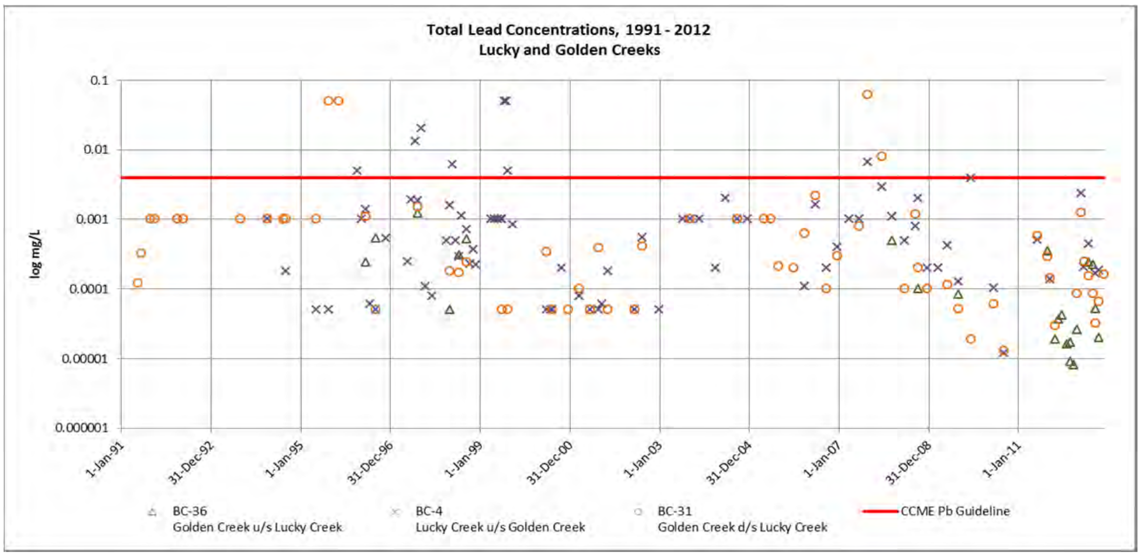

Total Lead Concentrations, 1991 - 2011
South Klondike River
log mg/L
1.000000
0.100000
0.010000
0.001000
0.000100
0.000010
0.000001
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
S. Klondike R. (BC-06)
CCME Pb Guideline
Reference Pb Conc.

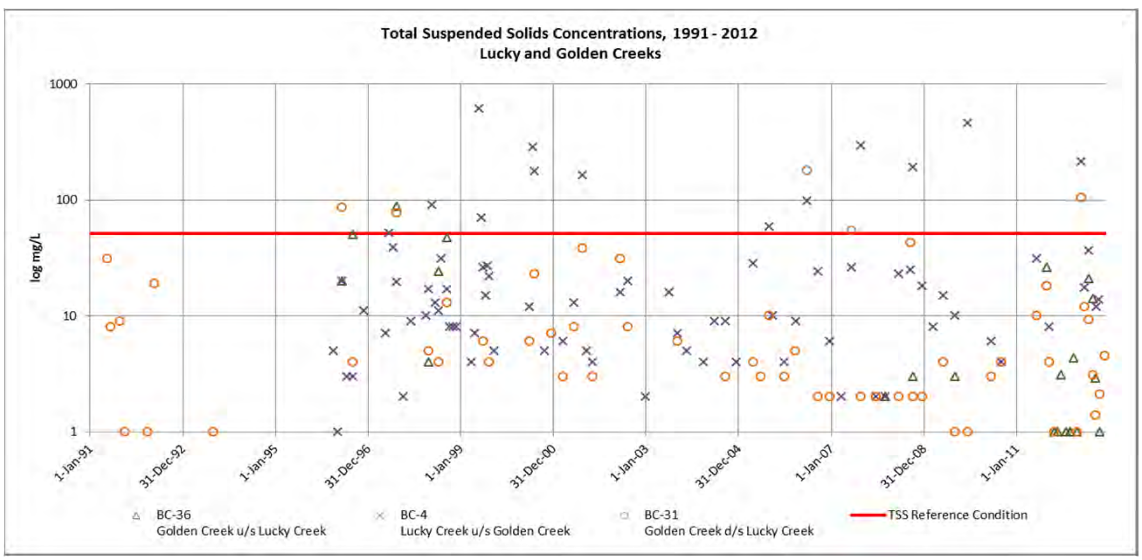

Total Suspended Solids Concentrations, 1991 - 2012
South Klondike River
log mg/L
100
10
1
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
S. Klondike R. (BC-06)
Reference TSS
MMER Limit

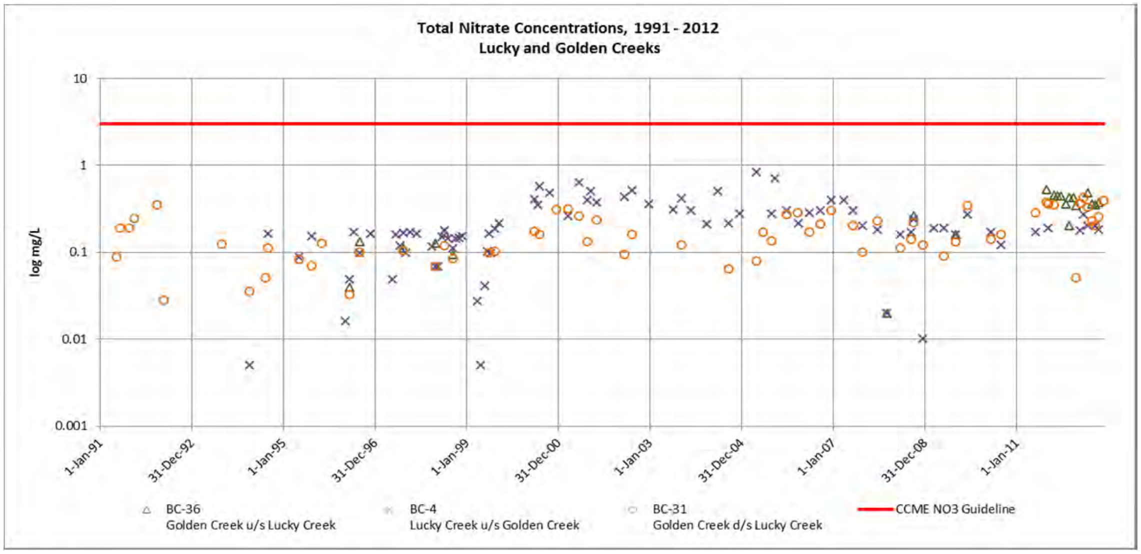

Total Nitrate Concentrations, 1991 - 2012
South Klondike River
log mg/L
10
1
0.1
0.01
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
1-Jan-01
1-Jan-03
1-Jan-05
1-Jan-07
1-Jan-09
2-Jan-11
S. Klondike R. (BC-06)
CCME NO3 Guideline
Reference NO3 Conc.


Total Zinc Concentrations, 1991 - 2012
Lucky and Golden Creeks
log mg/L
1
0.1
0.01
0.001
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
31-Dec-00
1-Jan-03
31-Dec-04
1-Jan-07
31-Dec-08
1-Jan-11
BC-36 Golden Creek u/s Lucky Creek
BC-4 Lucky Creek u/s Golden Creek
BC-31 Golden Creek d/s Lucky Creek
CCME Zn Guideline


Total Copper Concentrations, 1991 - 2012
Lucky and Golden Creeks
log mg/L
0.1
0.01
0.001
0.0001
0.00001
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
31-Dec-00
1-Jan-03
31-Dec-04
1-Jan-07
31-Dec-08
1-Jan-11
BC-36
Golden Creek u/s Lucky Creek
BC-4
Lucky Creek u/s Golden Creek
BC-31
Golden Creek d/s Lucky Creek
CCME Cu Guideline

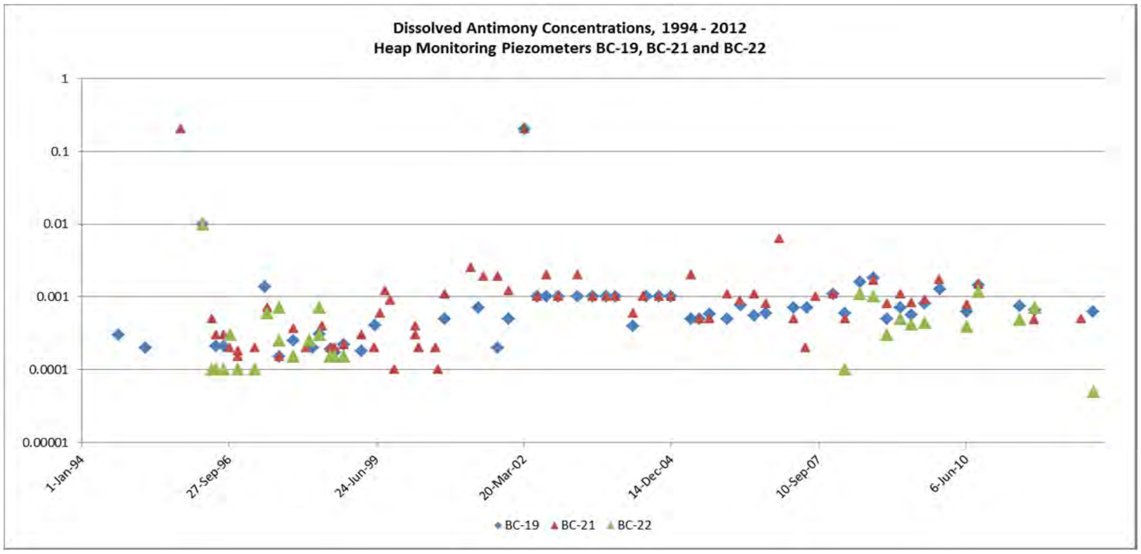

Total Lead Concentrations, 1991 - 2012
Lucky and Golden Creeks
log mg/L
0.1
0.01
0.001
0.0001
0.00001
0.000001
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
31-Dec-00
1-Jan-03
31-Dec-04
1-Jan-07
31-Dec-08
1-Jan-11
BC-36
Golden Creek u/s Lucky Creek
BC-4
Lucky Creek u/s Golden Creek
BC-31
Golden Creek d/s Lucky Creek
CCME Pb Guideline

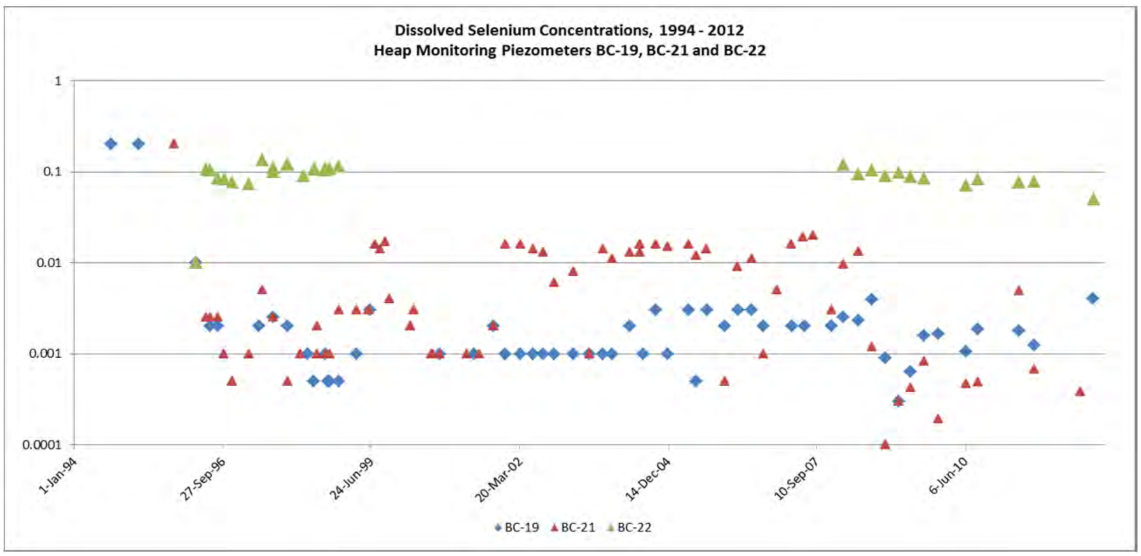

Total Suspended Solids Concentrations, 1991 - 2012
Lucky and Golden Creeks
log mg/L
1000
100
10
1
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
31-Dec-00
1-Jan-03
31-Dec-04
1-Jan-07
31-Dec-08
1-Jan-11
BC-36
Golden Creek u/s Lucky Creek
BC-4
Lucky Creek u/s Golden Creek
BC-31
Golden Creek d/s Lucky Creek
TSS Reference Condition

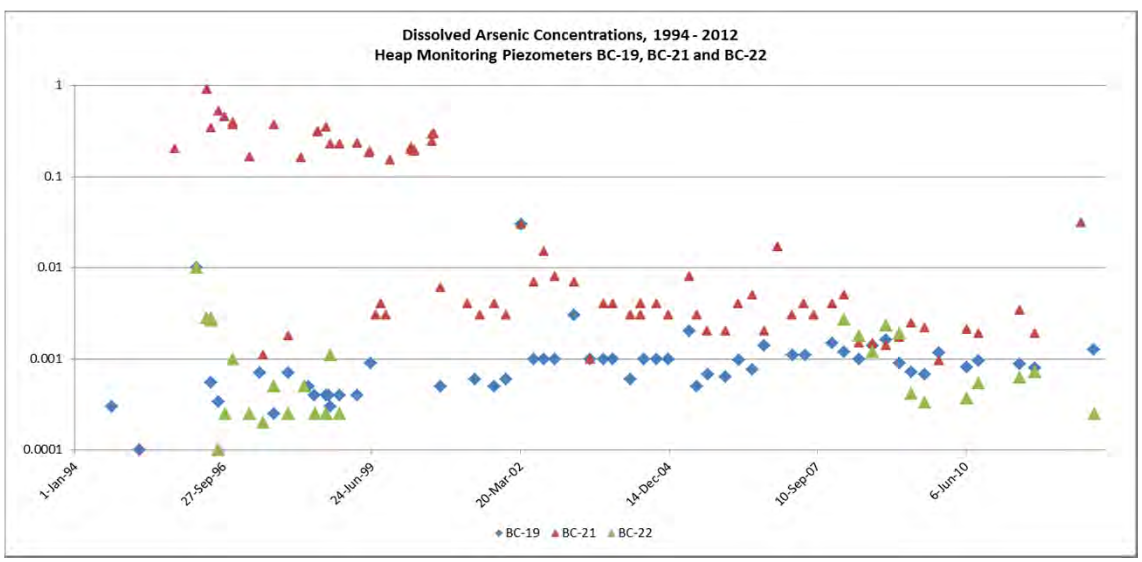

Total Nitrate Concentrations, 1991 - 2012
Lucky and Golden Creeks
log mg/L
10
1
0.1
0.01
0.001
1-Jan-91
31-Dec-92
1-Jan-95
31-Dec-96
1-Jan-99
31-Dec-00
1-Jan-03
31-Dec-04
1-Jan-07
31-Dec-08
1-Jan-11
BC-36
Golden Creek u/s Lucky Creek
BC-4
Lucky Creek u/s Golden Creek
BC-31
Golden Creek d/s Lucky Creek
CCME NO3 Guideline

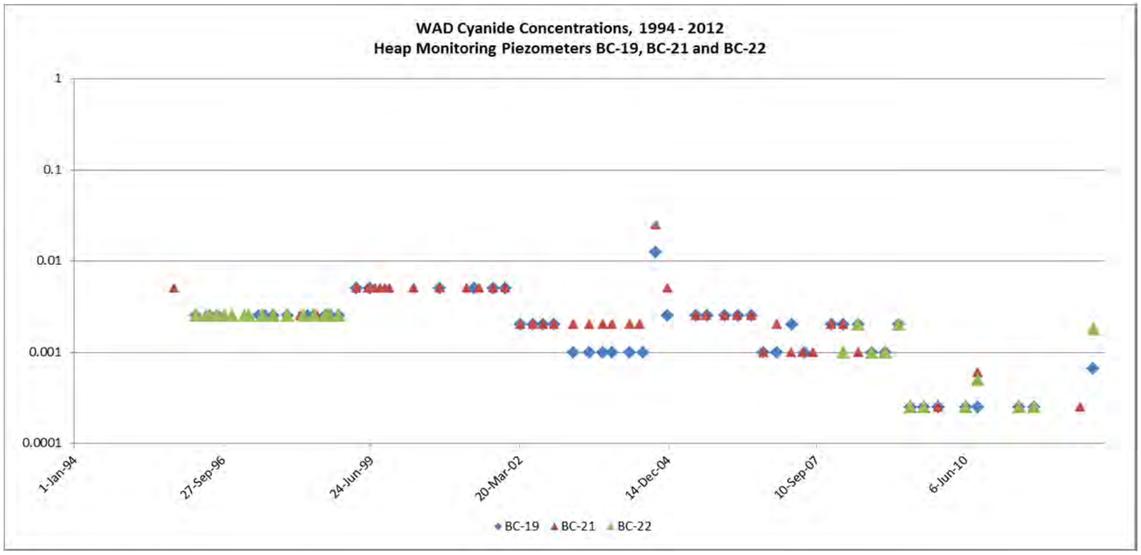
APPENDIX C

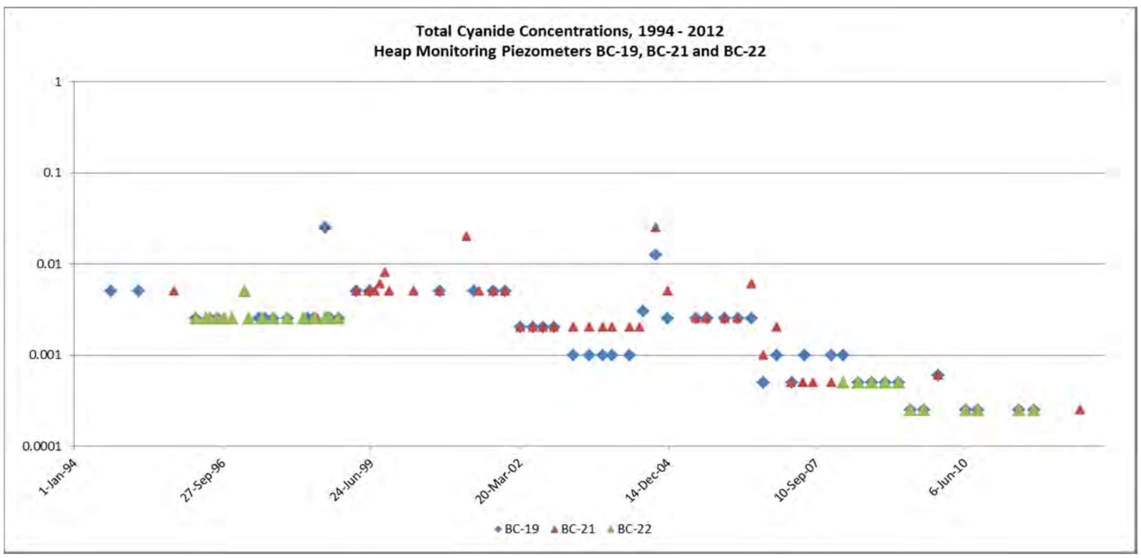
GROUNDWATER QUALITY STATIONS: GRAPHICAL DATA

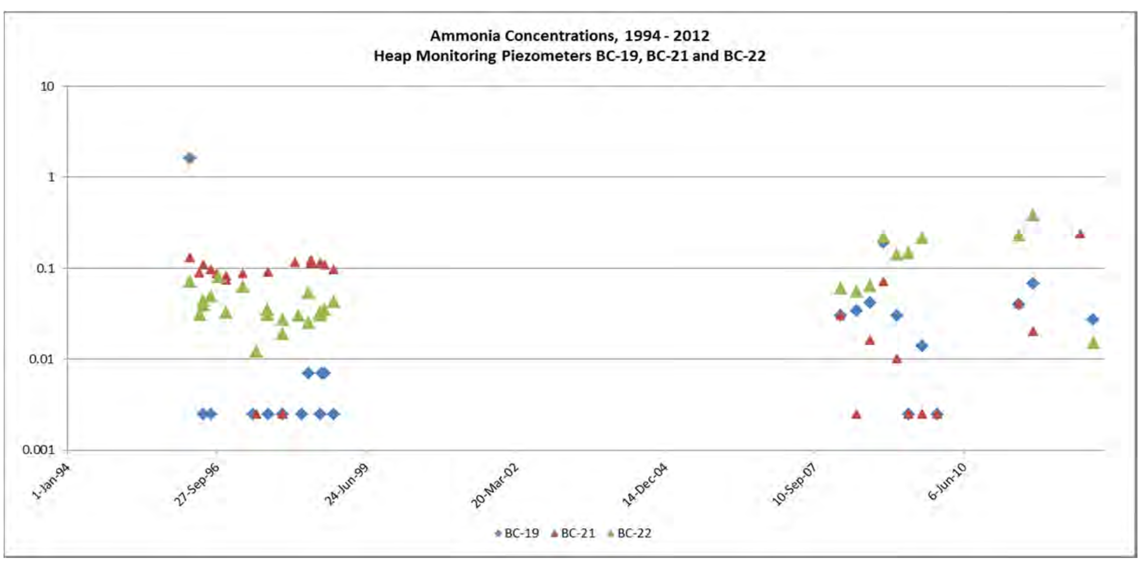

Dissolved Antimony Concentrations, 1994 - 2012
Heap Monitoring Piezometers BC-19, BC-21 and BC-22
1
0.1
0.01
0.001
0.0001
0.00001
1-Jan-94
27-Sep-96
24-Jun-99
20-Mar-02
14-Dec-04
10-Sep-07
6-Jun-10
BC-19
BC-21
BC-22

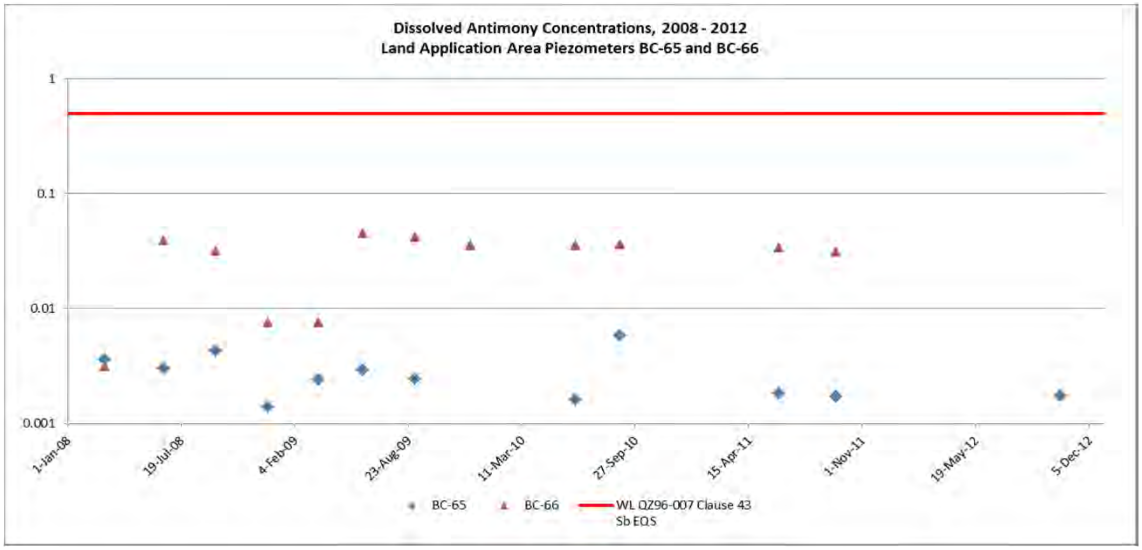

Dissolved Selenium Concentrations, 1994 - 2012
Heap Monitoring Piezometers BC-19, BC-21 and BC-22
1
0.1
0.01
0.001
0.0001
1-Jan-94
27-Sep-96
24-Jun-99
20-Mar-02
14-Dec-04
10-Sep-07
6-Jun-10
BC-19
BC-21
BC-22

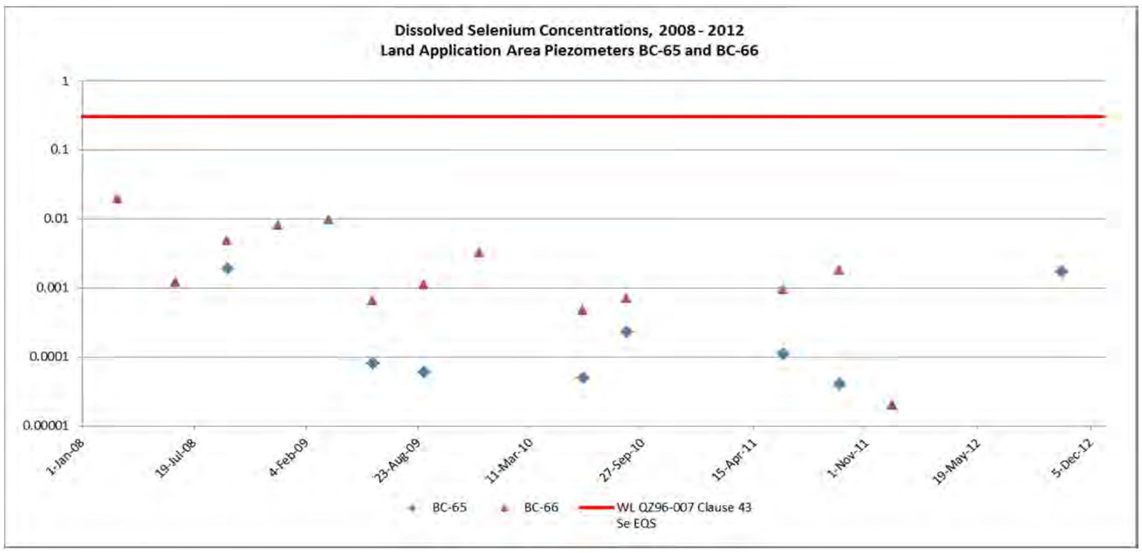

Dissolved Arsenic Concentrations, 1994 - 2012
Heap Monitoring Piezometers BC-19, BC-21 and BC-22
1
0.1
0.01
0.001
0.0001
1-Jan-94
27-Sep-96
24-Jun-99
20-Mar-02
14-Dec-04
10-Sep-07
6-Jun-10
BC-19
BC-21
BC-22

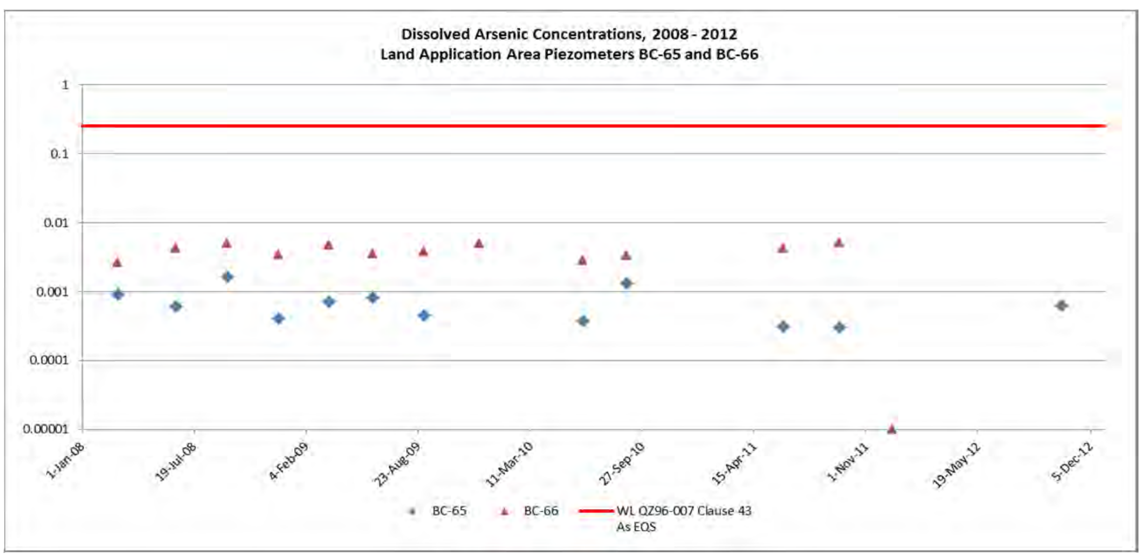

WAD Cyanide Concentrations, 1994 - 2012
Heap Monitoring Piezometers BC-19, BC-21 and BC-22
1
0.1
0.01
0.001
0.0001
1-Jan-94
27-Sep-96
24-Jun-99
20-Mar-02
14-Dec-04
10-Sep-07
6-Jun-10
BC-19
BC-21
BC-22

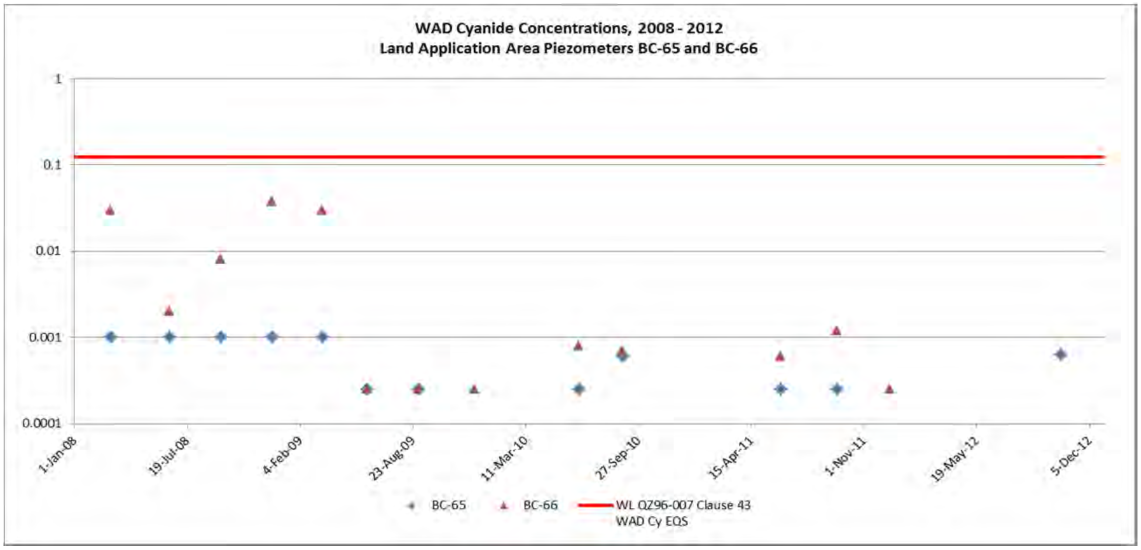

Total Cyanide Concentrations, 1994 - 2012
Heap Monitoring Piezometers BC-19, BC-21 and BC-22
1
0.1
0.01
0.001
0.0001
1-Jan-94
27-Sep-96
24-Jun-99
20-Mar-02
14-Dec-04
10-Sep-07
6-Jun-10
BC-19
BC-21
BC-22

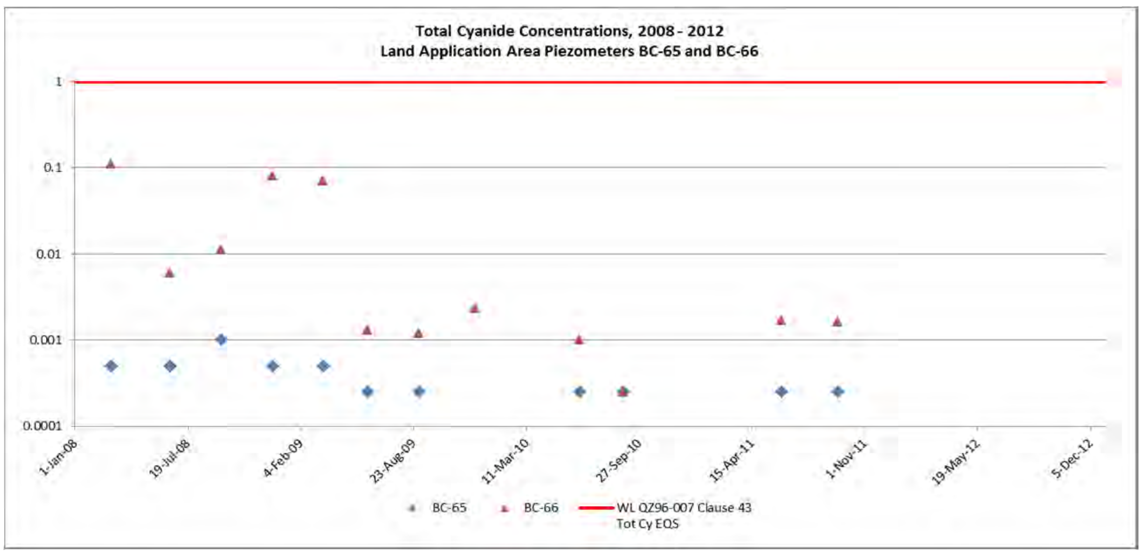

Ammonia Concentrations, 1994 - 2012
Heap Monitoring Piezometers BC-19, BC-21 and BC-22
10
1
0.1
0.01
0.001
1-Jan-94
27-Sep-96
24-Jun-99
20-Mar-02
14-Dec-04
10-Sep-07
6-Jun-10
BC-19
BC-21
BC-22

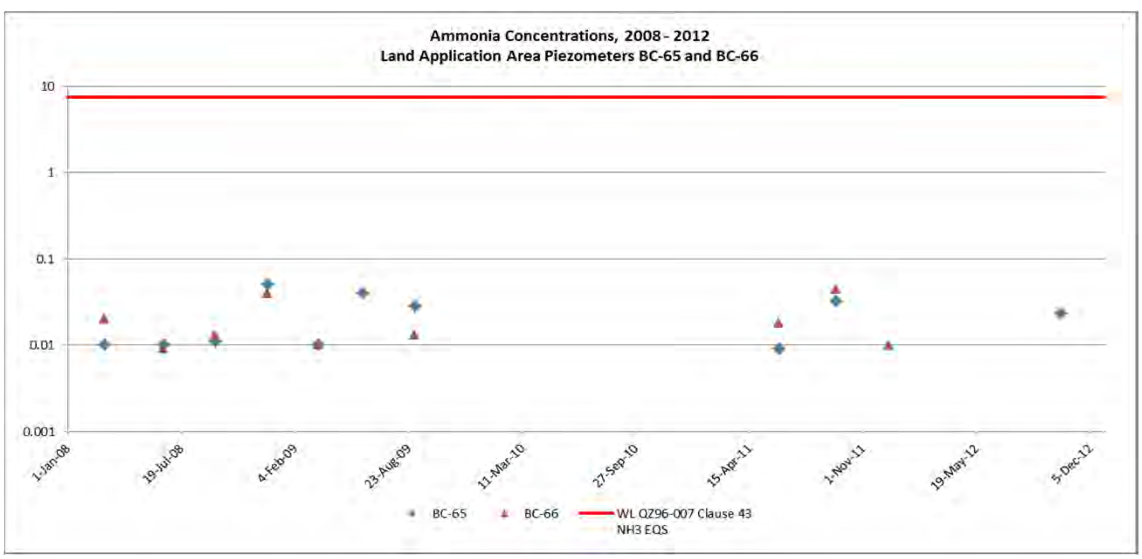

Dissolved Antimony Concentrations, 2008 - 2012
Land Application Area Piezometers BC-65 and BC-66
1
0.1
0.01
0.001
1-Jan-08
19-Jul-08
4-Feb-09
23-Aug-09
11-Mar-10
27-Sep-10
15-Apr-11
1-Nov-11
19-May-12
5-Dec-12
BC-65
BC-66
WL QZ96-007 Clause 43 Sb EQS

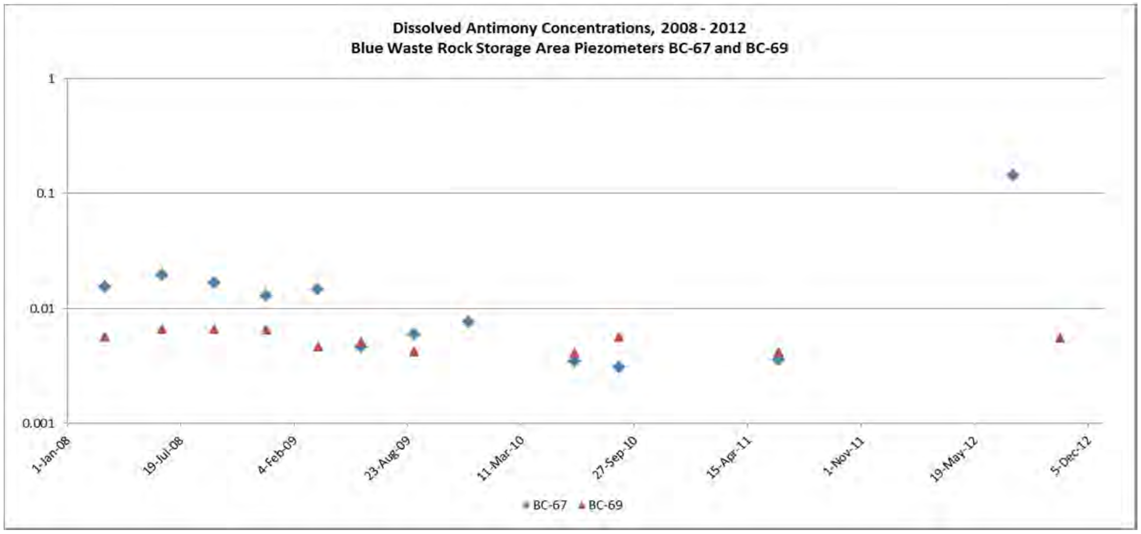

Dissolved Selenium Concentrations, 2008 - 2012
Land Application Area Piezometers BC-65 and BC-66
1
0.1
0.01
0.001
0.0001
0.00001
1-Jan-08
19-Jul-08
4-Feb-09
23-Aug-09
11-Mar-10
27-Sep-10
15-Apr-11
1-Nov-11
19-May-12
5-Dec-12
BC-65
BC-66
WL QZ96-007 Clause 43 Se EQS

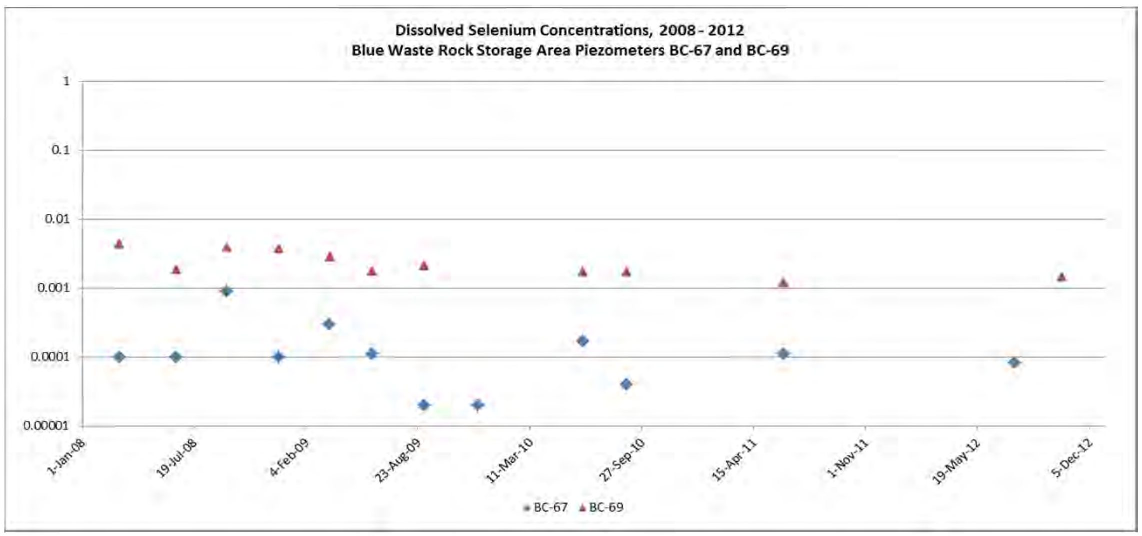

Dissolved Arsenic Concentrations, 2008 - 2012
Land Application Area Piezometers BC-65 and BC-66
1
0.1
0.01
0.001
0.0001
0.00001
1-Jan-08
19-Jul-08
4-Feb-09
23-Aug-09
11-Mar-10
27-Sep-10
15-Apr-11
1-Nov-11
19-May-12
5-Dec-12
BC-65
BC-66
WL QZ96-007 Clause 43 As EQS

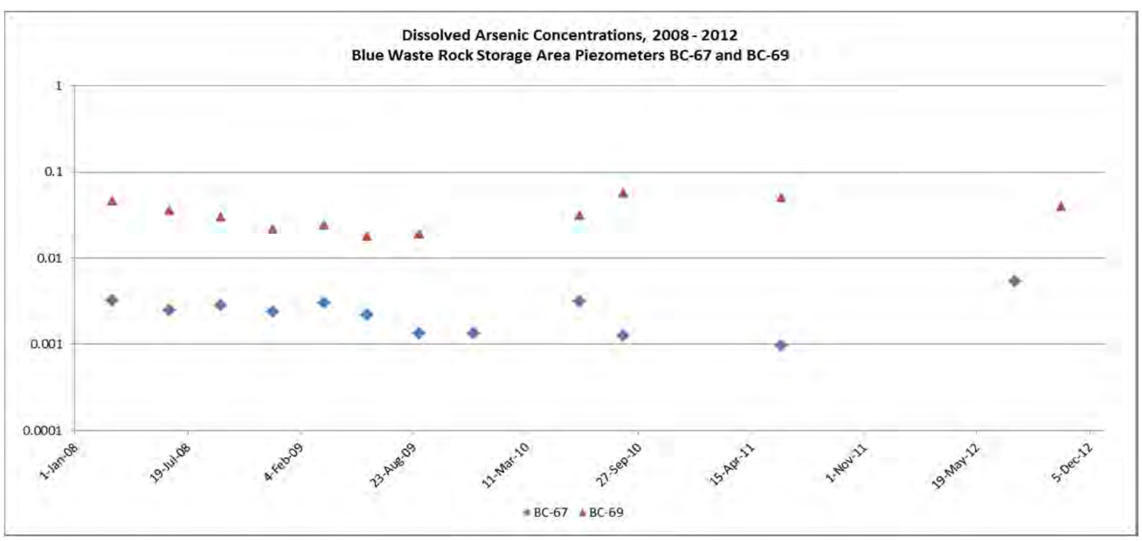

WAD Cyanide Concentrations, 2008 - 2012
Land Application Area Piezometers BC-65 and BC-66
1
0.1
0.01
0.001
0.0001
1-Jan-08
19-Jul-08
4-Feb-09
23-Aug-09
11-Mar-10
27-Sep-10
15-Apr-11
1-Nov-11
19-May-12
5-Dec-12
BC-65
BC-66
WL QZ96-007 Clause 43 WAD Cy EQS

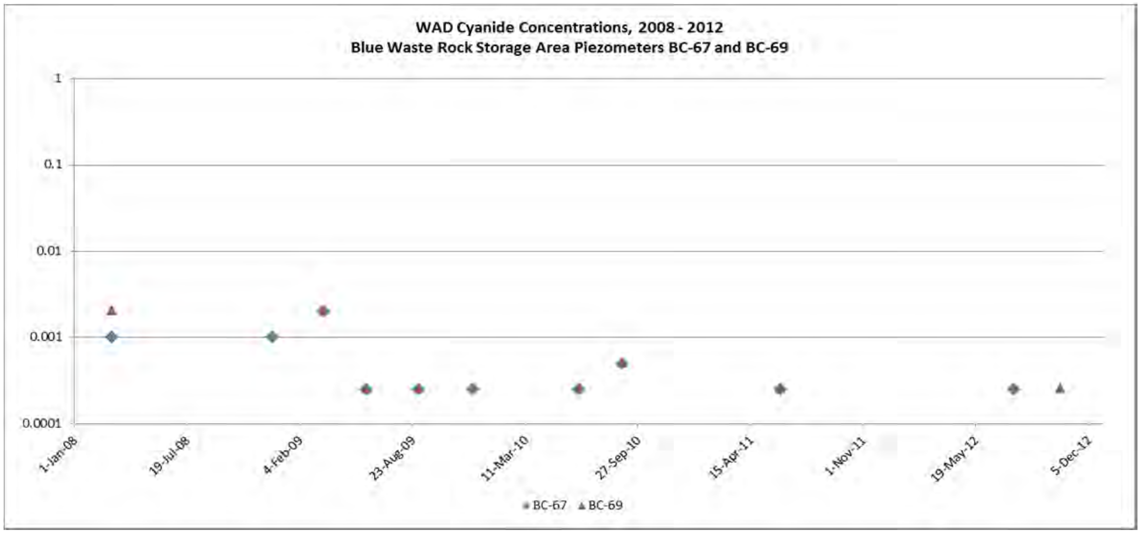

Total Cyanide Concentrations, 2008 - 2012
Land Application Area Piezometers BC-65 and BC-66
1
0.1
0.01
0.001
0.0001
1-Jan-08
19-Jul-08
4-Feb-09
23-Aug-09
11-Mar-10
27-Sep-10
15-Apr-11
1-Nov-11
19-May-12
5-Dec-12
BC-65
BC-66
WL QZ96-007 Clause 43 Tot Cy EQS

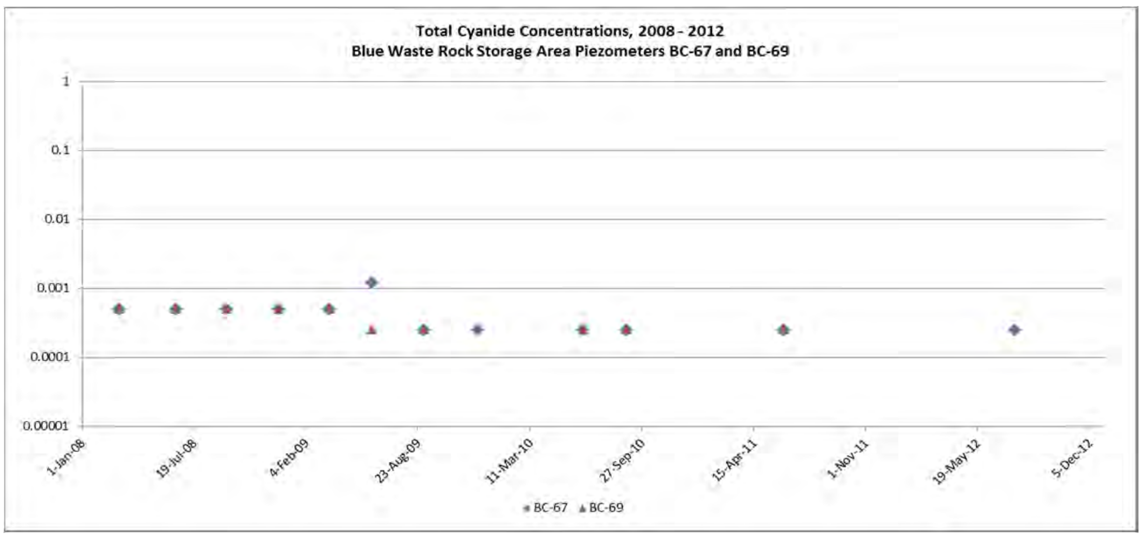

Ammonia Concentrations, 2008 - 2012
Land Application Area Piezometers BC-65 and BC-66
10
1
0.1
0.01
0.001
1-Jan-08
19-Jul-08
4-Feb-09
23-Aug-09
11-Mar-10
27-Sep-10
15-Apr-11
1-Nov-11
19-May-12
5-Dec-12
BC-65
BC-66
WL QZ96-007 Clause 43 NH3 EQS

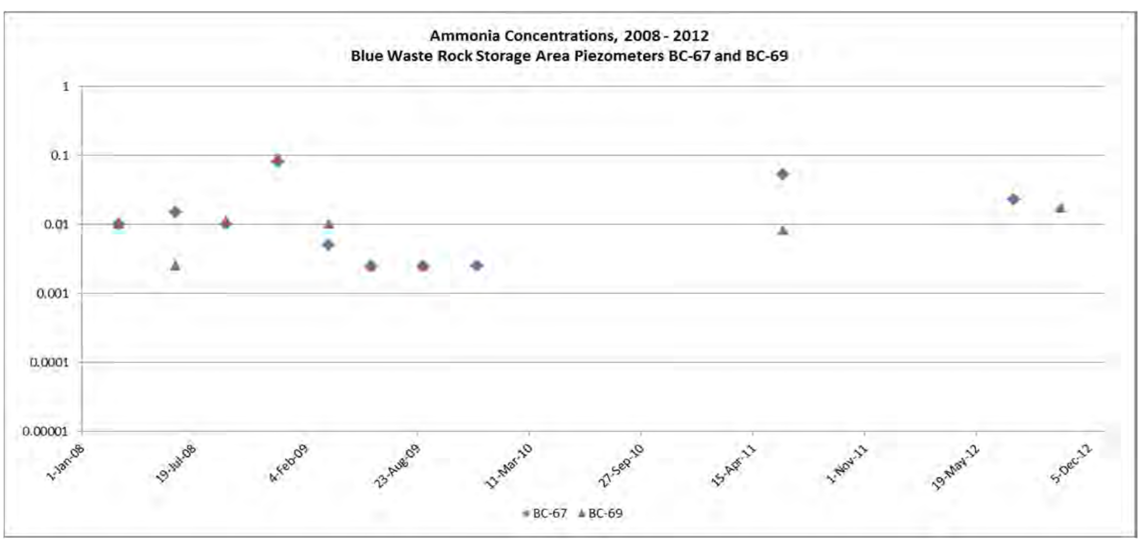

Dissolved Antimony Concentrations, 2008 - 2012
Blue Waste Rock Storage Area Piezometers BC-67 and BC-69
1
0.1
0.01
0.001
1-Jan-08
19-Jul-08
4-Feb-09
23-Aug-09
11-Mar-10
27-Sep-10
15-Apr-11
1-Nov-11
19-May-12
5-Dec-12
BC-67
BC-69


Dissolved Selenium Concentrations, 2008 - 2012
Blue Waste Rock Storage Area Piezometers BC-67 and BC-69
1
0.1
0.01
0.001
0.0001
0.00001
1-Jan-08
19-Jul-08
4-Feb-09
23-Aug-09
11-Mar-10
27-Sep-10
15-Apr-11
1-Nov-11
19-May-12
5-Dec-12
BC-67
BC-69


Dissolved Arsenic Concentrations, 2008 - 2012
Blue Waste Rock Storage Area Piezometers BC-67 and BC-69
1
0.1
0.01
0.001
0.0001
1-Jan-08
19-Jul-08
4-Feb-09
23-Aug-09
11-Mar-10
27-Sep-10
15-Apr-11
1-Nov-11
19-May-12
5-Dec-12
BC-67
BC-69


WAD Cyanide Concentrations, 2008 - 2012
Blue Waste Rock Storage Area Piezometers BC-67 and BC-69
1
0.1
0.01
0.001
0.0001
1-Jan-08
19-Jul-08
4-Feb-09
23-Aug-09
11-Mar-10
27-Sep-10
15-Apr-11
1-Nov-11
19-May-12
5-Dec-12
BC-67
BC-69


Total Cyanide Concentrations, 2008 - 2012
Blue Waste Rock Storage Area Piezometers BC-67 and BC-69
1
0.1
0.01
0.001
0.0001
0.00001
1-Jan-08
19-Jul-08
4-Feb-09
23-Aug-09
11-Mar-10
27-Sep-10
15-Apr-11
1-Nov-11
19-May-12
5-Dec-12
BC-67
BC-69


Ammonia Concentrations, 2008 - 2012
Blue Waste Rock Storage Area Piezometers BC-67 and BC-69
1
0.1
0.01
0.001
0.0001
0.00001
1-Jan-08
19-Jul-08
4-Feb-09
23-Aug-09
11-Mar-10
27-Sep-10
15-Apr-11
1-Nov-11
19-May-12
5-Dec-12
BC-67
BC-69

Station Type		SW-H											
Station Name		BC-01											
Description		Laura Creek, 50m u/s from Ditch Road											
Smpl Date		1/30/2012	2/28/2012	3/28/2012	4/23/2012	5/22/2012	6/19/2012	7/24/2012	8/28/2012	9/18/2012	10/18/2012	11/27/2012	4/21/2012
pH (field)	pH units				7.78	7.53	7.95	8.05	7.94	7.98	8.09	7.73	7.95
pH (lab)	pH units				7.47	7.69	8.06	8.12	8.26	8.18	8.07	7.84	7.95
Conductivity (field)	µS/cm					122					279		
Specific Conductivity (field)	µS/cm				103.7		346.2	434.9	376.8	514.7	534	673	353.8
Conductivity (lab)	µS/cm				99.7	233	368	411	455	507	532	617	359
Temperature (field)	C				0	1.19	4.2	3.8	3.3	0.9	-0.1	-0.1	0
Oxygen, Dissolved (field)	mg/L				15.94	15.36	13.63	13.9	12.71	14.31	15.35	9.79	14.68
Oxygen, Dissolved (field)	%				109.5		104.8	105	95.3	101.6	106.1	67	100.5
Oxidation-Reduction Potential	mV				88.5	77.5	142.5	259.9		100.2	32.3	81.9	88.4
Discharge (Flow)	L/s	DRY	DRY	DRY		209	195	175	152	88			
Staff Gauge Reading	m							0.404	0.403	0.415			
Total Suspended Solids	mg/L				44.1	221	85.1	27	44.3	2.6	2.8	11.1	11.4
Total Dissolved Solids	mg/L				110	166	242	316	288	368	358	400	266
Total Dissolved Solids - Field	mg/L					145							
Hardness (from total)	mg/L				49.9	114	187	216	215	257	264	327	166
Hardness (from dissolved)	mg/L				49.2	104	189	215	227	275	265	362	178
Alkalinity, Total	mg/L				27.1	60.5	101	122	130	143	139	170	85.4
Alkalinity, Bicarbonate HCO3	mg/L				33	73.9	123	148	158	175	170	208	104
Alkalinity, Hydroxide OH	mg/L				<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Alaklinity, Carbonate CO3	mg/L				<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Alkalinity, PP Carbonate CO3	mg/L				<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
Chloride	mg/L				1.2	1.3	0.64	0.83	0.52	0.79	0.89	0.71	0.88
Fluoride	mg/L				0.086	0.16	0.27	0.22	0.25	0.27	0.27	0.24	0.19
Sulphate, Dissolved	mg/L				19.8	48.6	84.1	91.9	103	119	133	156	100
Ion Balance	N/A							1	0.99	1.1			0.98
Ammonia Total	mg/L				0.032	0.047	0.015	0.0095	0.015	0.05	0.018	0.015	0.027
Nitrite, as N	mg/L				<0.050	<0.0050	<0.0050	<0.050	<0.050	<0.050	<0.0050	<0.0050	<0.050
Nitrate, as N	mg/L				0.24	0.393	0.376	0.22	<0.20	<0.20	1.24	0.217	<0.20
Nitrite & Nitrate, as N	mg/L				0.24	0.393	0.376	0.22	<0.20	<0.20	1.24	0.217	<0.20
Organic Carbon (C), Dissolved	mg/L				24.3	10.7	7.65	6.7	5.98	5.07	4.48	4.39	17.7
Organic Carbon (C), Total	mg/L				17.6	16.9	9.47	7.78	6.45	5.43	4.97	4.2	17.5
Cyanide, Total	mg/L												
Cyanide, Weak Acid Dissociable	mg/L				<0.00050	<0.00050	0.0007	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
Aluminum (Al), Total	mg/L				0.848	0.979	0.496	0.237	0.309	0.0412	0.0316	0.051	0.836
Antimony (Sb), Total	mg/L				0.00172	0.00253	0.00335	0.00325	0.00239	0.00268	0.0027	0.00226	0.00696
Arsenic (As), Total	mg/L				0.00672	0.0109	0.00556	0.00478	0.00444	0.00393	0.00438	0.00375	0.0088
Barium (Ba), Total	mg/L				0.0892	0.145	0.0964	0.0763	0.076	0.0605	0.0635	0.0808	0.068
Beryllium (Be), Total	mg/L				0.00013	0.000158	0.00007	0.000033	0.000037	<0.000010	<0.000010	0.00001	0.000051
Bismuth (Bi), Total	mg/L				0.0000168	0.0000085	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000076
Boron (B), Total	mg/L				<0.050	<0.05	<0.05	<0.050	<0.05	<0.05	<0.05	<0.05	<0.050
Cadmium (Cd), Total	mg/L				0.000176	0.000329	0.000107	0.000068	0.000058	0.000024	0.00002	0.000054	0.000186

Calcium (Ca), Total	mg/L				12.8	28.2	46.2	54	53.9	64.7	66.4	82.1	39.9
Chromium (Cr), Total	mg/L				0.00156	0.00179	0.00123	0.00059	0.00069	0.00022	0.00012	0.00023	0.00131
Cobalt (Co), Total	mg/L				0.0016	0.00331	0.00157	0.00082	0.000627	0.000261	0.00226	0.000274	0.000731
Copper (Cu), Total	mg/L				0.00489	0.00696	0.00376	0.00214	0.00217	0.000988	0.000809	0.000785	0.00296
Iron (Fe), Total	mg/L				1.83	2.65	1.14	0.577	0.78	0.149	0.113	0.148	0.656
Lead (Pb), Total	mg/L				0.00145	0.00228	0.000892	0.000344	0.000457	0.000046	0.000042	0.000166	0.000571
Lithium (Li), Total	mg/L				0.0026	0.00663	0.00836	0.00903	0.00948	0.0108	0.0106	0.0126	0.00815
Magnesium (Mg), Total	mg/L				4.34	10.7	17.5	19.7	19.4	23.3	23.9	29.6	16.1
Manganese (Mn), Total	mg/L				0.0865	0.265	0.0738	0.0536	0.0674	0.0507	0.0417	0.103	0.183
Mercury (Hg), Total	mg/L				<0.000010			<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000025
Molybdenum (Mo), Total	mg/L				0.000688	0.0012	0.00187	0.00236	0.00226	0.00289	0.00312	0.00335	0.00139
Nickel (Ni), Total	mg/L				0.00328	0.00765	0.00427	0.00304	0.00331	0.00212	0.0018	0.00192	0.00491
Phosphorous (p), Total	mg/L				0.122			0.026	0.0334	0.013			0.0542
Potassium (K), Total	mg/L				1.62	1.06	1.03	1.09	1.13	1.29	1.24	1.55	1.89
Selenium (Se), Total	mg/L				0.000516	0.00168	0.00227	0.00194	0.00149	0.00191	0.00219	0.00161	0.00111
Silicon (Si), Total	mg/L				3.55	4.23	5.02	5.22	5.12	5.28	5.47	6.76	4.51
Silver (Ag), Total	mg/L				0.0000191	0.0000314	0.0000067	0.000007	0.000007	<0.0000050	<0.0000050	<0.0000050	0.0000341
Sodium (Na), Total	mg/L				1.51	2.05	3.16	3.3	3.12	3.66	5.49	5.09	2.47
Strontium (Sr), Total	mg/L				0.0553	0.138	0.215	0.258	0.262	0.305	0.304	0.4	0.204
Sulphur (S), Total	mg/L				<10	18	30	34	37	44	47	64.1	31
Thallium (Tl), Total	mg/L				0.0000119	0.0000156	0.000005	0.000005	0.000006	0.000003	0.000003	0.000004	0.0000258
Tin (Sn), Total	mg/L				<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00021	0.0003
Titanium (Ti), Total	mg/L				0.0306	0.0235	0.0145	0.0086	0.00998	0.00155	0.00126	0.00249	0.0204
Uranium (U), Total	mg/L				0.000533	0.00119	0.00159	0.00164	0.00189	0.00213	0.00232	0.00281	0.00105
Vanadium (V), Total	mg/L				0.00532	0.00671	0.00331	0.0019	0.00213	0.00075	0.00069	0.00093	0.00352
Zinc (Zn), Total	mg/L				0.0149	0.0219	0.00856	0.00565	0.0062	0.00196	0.00169	0.00343	0.011
Zirconium (Zr), Total	mg/L				0.00113	0.00075	0.00039	0.00026	0.00024	0.00013	0.00011	<0.00010	0.00115
Aluminum (Al), Dissolved	mg/L				0.141	0.0511	0.0351	0.0289	0.0205	0.0142	0.0124	0.00595	0.0948
Antimony (Sb), Dissolved	mg/L				0.0016	0.00233	0.00368	0.00323	0.00259	0.00284	0.00277	0.00256	0.00461
Arsenic (As), Dissolved	mg/L				0.00401	0.00287	0.00355	0.00394	0.00339	0.00412	0.00403	0.00376	0.00255
Barium (Ba), Dissolved	mg/L				0.0533	0.0394	0.0533	0.0585	0.0577	0.0634	0.0623	0.0853	0.0459
Beryllium (Be), Dissolved	mg/L				0.000032	0.000032	0.000018	0.000016	0.000011	<0.000010	<0.000010	<0.000010	0.000021
Bismuth (Bi), Dissolved	mg/L				<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
Boron (B), Dissolved	mg/L				<0.050	<0.05	<0.05	<0.050	<0.05	<0.05	<0.05	<0.05	<0.050
Cadmium (Cd), Dissolved	mg/L				0.0000507	0.0000268	0.0000248	0.000024	0.000017	0.000025	0.000024	0.000056	0.0000941
Calcium (Ca), Dissolved	mg/L				12.5	25.7	48.1	53.8	57.1	69.3	66.3	92.9	43
Chromium (Cr), Dissolved	mg/L				0.0004	0.00018	0.00027	0.00026	0.00021	0.00017	0.00015	<0.00010	0.00035
Cobalt, Dissolved	mg/L				0.0011	0.000885	0.0008	0.000524	0.00026	0.000237	0.00225	0.000232	0.000496
Copper (Cu), Dissolved	mg/L				0.00224	0.00165	0.00149	0.00118	0.00118	0.00274	0.000932	0.000942	0.00222
Iron (Fe), Dissolved	mg/L				0.551	0.234	0.175	0.142	0.119	0.0934	0.0525	0.0346	0.205
Lead (Pb), Dissolved	mg/L				0.000126	0.0000428	0.0000681	0.00002	0.000153	0.000031	0.000048	0.000056	0.000136
Lithium (Li), Dissolved	mg/L				0.00208	0.00569	0.00811	0.00876	0.00976	0.0114	0.0104	0.0141	0.00808
Magnesium (Mg), Dissolved	mg/L				4.34	9.68	16.7	19.5	20.6	24.8	24.1	31.5	17.3
Manganese (Mn), Dissolved	mg/L				0.0576	0.0575	0.0302	0.0351	0.0456	0.0517	0.0395	0.101	0.177
Mercury (Hg), Dissolved	mg/L				<0.000010			<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
Molybdenum (Mo), Dissolved	mg/L				0.000837	0.00146	0.00229	0.00261	0.00251	0.0031	0.00322	0.00376	0.00153
Nickel (Ni), Dissolved	mg/L				0.00199	0.00222	0.00217	0.00229	0.00214	0.00295	0.00199	0.00194	0.00398

Phosphorous (P), Dissolved	mg/L				0.061			0.0089	0.0073	0.008			0.0391
Potassium (K), Dissolved	mg/L				1.53	0.92	1.12	1.04	1.17	1.36	1.3	1.65	1.79
Selenium (Se), Dissolved	mg/L				0.000595	0.00165	0.00239	0.00189	0.00142	0.00187	0.00248	0.00194	0.00114
Silicon (Si), Dissolved	mg/L				2.66	3.08	4.84	4.89	5.25	5.81	5.45	7.58	3.68
Silver (Ag), Dissolved	mg/L				0.0000185	0.0000054	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000154
Sodium (Na), Dissolved	mg/L				1.46	1.96	3.15	3.28	3.36	3.88	5.64	5.59	2.66
Strontium (Sr), Dissolved	mg/L				0.0565	0.13	0.214	0.253	0.278	0.327	0.313	0.442	0.221
Sulphur (S), Dissolved	mg/L				<10	16	32	33	38	47	49	64.9	34
Thallium (Tl), Dissolved	mg/L				0.0000024	0.0000024	<0.0000020	0.000003	<0.0000020	0.000004	0.000003	0.000004	0.0000049
Tin (Sn), Dissolved	mg/L				<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00055	0.00022	0.00025	0.00023
Titanium (Ti), Dissolved	mg/L				0.00271	0.00073	0.00078	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.0018
Uranium (U), Dissolved	mg/L				0.000349	0.00085	0.00152	0.00157	0.0019	0.00232	0.00235	0.0032	0.00115
Vanadium (V), Dissolved	mg/L				0.00181	0.00079	0.00073	0.0009	0.00059	0.00062	0.00055	0.00082	0.00059
Zinc (Zn), Dissolved	mg/L				0.00356	0.00176	0.00554	0.00212	0.00185	0.00173	0.00209	0.0055	0.00991
Zirconium (Zr), Dissolved	mg/L				0.00049	0.00029	0.00023	0.00019	0.00019	0.00014	0.00011	0.00011	0.0004

SW-H					SW-H										
BC-02					BC-03										
Carolyn Creek, u/s from Laura Creek					Laura Creek, above confluence w/ Carolyn Creek									Lucky (	
5/24/2012	**7/25/2012**	**8/28/2012**	**9/19/2012**	**10/15/2012**	**4/21/2012**	**5/24/2012**	**6/19/2012**	**7/25/2012**	**8/28/2012**	**9/19/2012**	**10/15/2012**	**11/28/2012**	**2/12/2013**	**5/23/2012**	**6/19/2012**
	7.72	7.44	7.58	7.5	7.38	3.25	7.84	8.14	7.74	7.83	7.81	7.22	7.97	6.26	6.74
7.86	7.9	8.1	8.12	8.04	7.3	7.83	8.06	8.12	8.28	8.27	8.14	7.84	8.11	7.72	8.05
				542		127					279			126	
0.128	573.9	494.3	448.1	1035	140.8		360.8	454.9	392.7	538.4	535	793.3	771		
219	545	614	785	1010	139	216	383	429	475	530	524	744	1190	217	530
0.53	3.9	3.9	2.3	0.07	0	0.44	4.0	2.5	3.0	1.9	0.01	-0.1	0.46	0.34	2.5
15.46	12.7	11.3	13.43	12.57	15.67	15.5	13.63	13.8	12.48	13.92	12.88	10.61	9.35	16.01	12.16
	97	85.9	98.1	86.6	107.3		104.2	101	92.9	100.6	88	72.9	69.6		
274.7	244.2		14.2	-4.9	162.9	353	138.9	250.1		62.0	8.8	137.6		181.9	162.5
	8	8	9			263	216	127	116	70					
	0.165	0.178	0.170	0.16			0.290	0.265	0.262	0.250					
142	85.3	108	12.2	51	9.2	138	8.7	5.3	4.9	12.9	1.7	1.3	<1.0	215	17.4
142	438	436	556	698	156	122	248	330	306	378	342	494	878	124	356
156						155								154	
107	279	283	400	464	53.7	106	193	226	223	285	283	378	587	106	276
106	271	294	401	436	54.9	105	192	227	237	281	268	466	615	103	268
63.7	103	122	156	136	24.4	63.7	112	127	135	148	143	183	204	52.7	117
77.7	126	149	190	166	29.8	77.7	136	156	165	181	174	223	248	64.3	143
<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
1.2	1.1	0.7	1.2	3.7	1.7	1.2	0.78	0.58	<0.50	0.79	0.8	0.84	1.1	1.3	<0.50
0.14	0.16	0.21	0.24	0.22	0.084	0.14	0.26	0.22	0.24	0.26	0.25	0.24	0.31	0.14	0.31
40.2	164	173	247	285	34.8	40.9	86	96.2	107	129	134	223	473	52.3	153
	1.1	1	1					1	1	1					
0.033	0.064	0.088	0.064	0.08	0.023	0.028	0.0091	0.012	0.028	0.014	0.012	0.02	0.015	0.025	0.016
<0.0050	<0.050	<0.050	<0.050	0.0284	<0.050	<0.0050	<0.0050	<0.050	<0.050	<0.050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
0.232	1.12	0.2	0.27	24.8	1.54	0.229	0.23	<0.20	<0.20	<0.20	0.181	0.209	<0.020	0.176	0.269
0.232	1.12	0.2	0.27	24.9	1.54	0.229	0.23	<0.20	<0.20	<0.20	0.181	0.209	<0.020	0.176	0.269
<5.0	12.9	10	7.87	5.89	26	10.8	7.47	6.1	4	5.33	4.55	3.77	5.3	12.3	3.79
10.4	13.3	11.1	7.74	6.37	27.6	14.9	7.66	6.02	5.75	4.48	6.97	1.47	6.67	16	4.62
0.0008	0.00085	0.00139	<0.00050	0.00213	0.00109	0.0005	0.00072	<0.00050	0.00065	<0.00050	0.00085	0.0005	0.00055	<0.00050	0.00083
0.734	0.516	0.492	0.0747	0.112	1.59	0.752	0.109	0.0787	0.0684	0.0393	0.0366	0.0116	0.00555	0.851	0.133
0.00294	0.00102	0.0007	0.000581	0.00428	0.00474	0.0029	0.00453	0.00396	0.003	0.00335	0.00347	0.00301	0.00191	0.00349	0.00347
0.00933	0.0016	0.00179	0.000772	0.000667	0.00274	0.00977	0.00324	0.00281	0.00278	0.0023	0.00193	0.00154	0.00392	0.0101	0.00349
0.101	0.149	0.127	0.0929	0.114	0.0741	0.103	0.0575	0.0589	0.0563	0.059	0.0618	0.0733	0.0964	0.14	0.0774
0.000155	0.00005	0.000048	0.000013	0.000013	0.000062	0.000142	0.000028	0.00003	0.000033	0.00002	0.000023	0.000013	<0.000010	0.000092	0.000015
0.0000092	0.000006	0.000007	<0.0000050	<0.0000050	0.0000079	0.0000117	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000138	<0.0000050
<0.05	<0.050	<0.05	<0.05	<0.05	<0.050	<0.05	<0.05	<0.050	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
0.000383	0.000071	0.000059	0.00002	0.00002	0.000118	0.000368	0.0000682	0.000056	0.000053	0.000049	0.000046	0.000052	0.000059	0.000454	0.000139

26.9	67	65.5	94	114	13.3	26.4	48.4	56.4	56	72.3	70.6	92.1	135	25.6	65
0.00136	0.00106	0.00094	0.00029	0.00026	0.00198	0.00154	0.00031	0.00019	0.00017	0.00014	0.00013	<0.00010	<0.00010	0.00132	0.00029
0.00255	0.00616	0.00252	0.00174	0.045	0.0054	0.0022	0.000521	0.00053	0.000594	0.000527	0.000385	0.000264	0.00115	0.00212	0.00122
0.00626	0.00292	0.00294	0.00152	0.000969	0.00372	0.006	0.00167	0.00139	0.00136	0.000958	0.000999	0.000654	0.000527	0.00514	0.00106
1.75	1.78	1.98	0.692	0.576	1	1.8	0.31	0.228	0.239	0.169	0.118	0.0883	0.0153	2.34	0.484
0.00169	0.000924	0.00106	0.000168	0.000176	0.000772	0.00163	0.000147	0.000083	0.000084	0.000038	0.000048	0.00003	0.000015	0.00235	0.000208
0.00606	0.0104	0.0111	0.0149	0.0178	0.00298	0.00576	0.00875	0.00954	0.0101	0.0121	0.012	0.0169	0.027	0.00353	0.00808
9.71	27.1	29	40.3	43.6	4.96	9.7	17.6	20.6	20.2	25.4	25.9	35.9	60.5	10.3	27.6
0.222	0.24	0.281	0.274	0.225	0.0382	0.201	0.0485	0.052	0.0604	0.0537	0.0542	0.151	0.00636	0.175	0.119
	<0.000010	<0.000010	<0.000010	<0.000010	0.000016			<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010		
0.000995	0.0004	0.000408	0.000427	0.000311	0.000317	0.00109	0.0018	0.00217	0.00216	0.00235	0.00228	0.00193	0.00154	0.000841	0.00215
0.0083	0.00343	0.00333	0.00195	0.00164	0.00322	0.00737	0.00352	0.00349	0.00358	0.00353	0.00335	0.00289	0.00115	0.00755	0.0062
	0.0743	0.0862	0.0241		0.0748			0.0107	0.0116	0.008					
0.986	1.07	1.17	1.56	2.05	2.54	0.984	1.09	1.16	1.18	1.45	1.32	1.7	2.35	0.861	1.15
0.00154	0.00367	0.00287	0.00519	0.0133	0.00153	0.00163	0.00244	0.0019	0.00149	0.00161	0.00171	0.00156	0.00343	0.00185	0.00547
3.57	5.99	5.17	5.38	5.38	4.99	3.58	4.13	4.44	4.12	5.32	4.7	5.31	6.54	2.66	3.62
0.0000333	0.00001	0.000015	<0.0000050	<0.0000050	0.0000486	0.0000394	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000258	<0.0000050
1.29	10.2	7.1	8.72	39.4	5.12	1.28	2.2	2.55	2.57	3.17	3.29	4.84	10.9	0.834	2.12
0.13	0.199	0.203	0.264	0.328	0.0423	0.129	0.228	0.272	0.277	0.327	0.332	0.473	0.823	0.154	0.399
15	64	68	95	110	<10	15	30	35	37	46	50	85.8	141	19	58
0.0000156	0.000004	0.000002	<0.0000020	<0.0000020	0.000025	0.0000142	0.0000048	0.000004	0.000004	0.000002	0.000002	<0.0000020	<0.0000020	0.0000348	0.0000102
<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00029	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00052
0.0178	0.0154	0.0134	0.00296	0.00381	0.0435	0.0203	0.00294	0.00169	0.00172	0.00062	0.00071	<0.00050	<0.00050	0.0182	0.00391
0.00107	0.00108	0.00135	0.0018	0.00156	0.000202	0.00106	0.00144	0.00149	0.00168	0.00202	0.00205	0.00268	0.00303	0.00117	0.00269
0.00457	0.00316	0.00287	0.00065	0.00055	0.00366	0.00479	0.00085	0.00073	0.00059	0.00046	<0.00020	0.00033	<0.00020	0.00686	0.00218
0.022	0.00809	0.00764	0.00269	0.00224	0.0121	0.0202	0.00562	0.00692	0.00601	0.00594	0.00581	0.00568	0.00513	0.0315	0.0144
0.00053	0.00075	0.00051	0.00028	0.00017	0.00289	0.00055	0.00021	0.00019	0.00017	0.00012	<0.00010	<0.00010	<0.00010	0.00048	0.00013
0.0586	0.0568	0.0235	0.0169	0.014	0.171	0.0593	0.0413	0.0364	0.0368	0.0282	0.0222	0.00739	0.00472	0.0826	0.029
0.00268	0.00104	0.000691	0.000592	0.00433	0.00425	0.00266	0.00454	0.00398	0.00317	0.00342	0.00337	0.00345	0.0019	0.00304	0.00361
0.0028	0.000901	0.000753	0.000625	0.000424	0.00131	0.00292	0.00263	0.00247	0.00216	0.00196	0.00179	0.0016	0.00403	0.00296	0.00284
0.0378	0.108	0.0851	0.0898	0.104	0.0413	0.0379	0.05	0.0563	0.0557	0.0585	0.0597	0.0862	0.0952	0.0479	0.0696
0.000032	0.000016	0.00001	<0.000010	<0.000010	0.000022	0.000028	0.000026	0.000028	0.000028	0.000017	0.000017	0.000011	<0.000010	0.000013	<0.000010
<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
<0.05	<0.050	<0.05	<0.05	<0.05	<0.050	<0.05	<0.05	<0.050	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
0.0000521	0.000038	0.000012	0.000012	0.000011	0.0000829	0.0000622	0.0000465	0.000048	0.000097	0.000048	0.000042	0.000066	0.000059	0.0000926	0.000106
26.6	64.6	69.9	95.5	106	13.5	26.5	47	56.5	59.8	70.9	66.1	110	139	24.3	61.7
0.00017	0.00036	0.00024	0.0002	0.00012	0.0004	0.00019	0.0002	0.00014	0.00015	0.00011	0.00011	<0.00010	<0.00010	0.00016	0.00027
0.000543	0.00568	0.00207	0.00167	0.0439	0.00549	0.000515	0.000415	0.000448	0.000554	0.000473	0.000354	0.000306	0.00122	0.000496	0.00117
0.0022	0.00146	0.00113	0.000922	0.000575	0.00267	0.00211	0.00161	0.00125	0.00164	0.00122	0.000985	0.000862	0.000585	0.00155	0.00071
0.192	0.649	0.423	0.385	0.238	0.289	0.197	0.134	0.114	0.116	0.088	0.0593	0.0791	0.0125	0.212	0.194
0.0000481	0.000097	0.000028	0.000033	0.000007	0.000132	0.0000458	0.0000418	0.000013	0.000105	0.000229	0.00001	0.00003	0.000013	0.000105	0.0000304
0.00527	0.01	0.0109	0.0153	0.0171	0.00266	0.0051	0.00847	0.00946	0.0105	0.0122	0.0116	0.0203	0.0263	0.00276	0.00789
9.74	26.6	29.1	39.6	41.3	5.13	9.5	18.2	20.8	21.3	25.3	25	46.4	65.1	10.3	27.7
0.0742	0.228	0.265	0.265	0.213	0.033	0.0654	0.0399	0.0463	0.057	0.0477	0.0531	0.18	0.00758	0.0713	0.12
	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010			<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010		
0.00115	0.00046	0.000493	0.000462	0.00035	0.000305	0.00121	0.00203	0.00221	0.00233	0.0024	0.00236	0.00228	0.00158	0.000907	0.00239
0.00339	0.00256	0.00219	0.00176	0.00131	0.00234	0.00316	0.00333	0.00349	0.00366	0.00354	0.00378	0.00384	0.00109	0.00343	0.00593

	0.0166	0.0118	0.0148		0.0463			0.006	0.0084	0.0081					
0.932	1.04	1.19	1.52	1.89	2.24	0.896	1.18	1.16	1.31	1.42	1.25	2.22	2.47	0.851	1.22
0.00148	0.0036	0.0033	0.00508	0.0148	0.00149	0.00152	0.00237	0.00194	0.00167	0.00148	0.00179	0.00172	0.00343	0.00172	0.00566
2.99	5.35	5.34	5.39	4.99	2.82	2.91	4.12	4.38	4.53	5.16	4.38	6.03	7.08	1.88	3.36
0.0000071	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000235	0.0000063	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000066	<0.0000050
1.36	10.4	7.41	8.66	37.5	5.39	1.33	2.49	2.55	2.94	3.22	3.17	6.23	12	0.93	2.18
0.122	0.195	0.211	0.27	0.32	0.0458	0.121	0.231	0.268	0.289	0.326	0.323	0.57	0.793	0.145	0.403
15	62	68	92	107	11	15	32	35	39	47	47	104	156	18	61
0.0000032	<0.0000020	<0.0000020	<0.0000020	<0.0000020	0.0000025	0.000004	0.000004	0.000003	0.000003	0.000002	0.000002	0.000002	<0.0000020	0.0000048	0.0000092
<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00021	<0.00020	<0.00020	<0.00020
0.00093	0.00111	0.00101	<0.00050	<0.00050	0.00321	0.00128	<0.00050	<0.00050	0.00052	0.00052	<0.00050	<0.00050	<0.00050	0.00061	<0.00050
0.000722	0.000992	0.0013	0.00187	0.00153	0.000158	0.000694	0.0014	0.00149	0.00177	0.00201	0.00202	0.00328	0.00334	0.000858	0.00276
0.00073	0.00074	0.00025	0.00024	<0.00020	0.00059	0.00075	<0.00020	0.00052	0.00023	0.00034	<0.00020	0.00031	0.00025	0.00106	0.00163
0.00446	0.00542	0.0012	0.00141	0.00077	0.00799	0.0041	0.00356	0.00547	0.00645	0.00511	0.00469	0.00674	0.00541	0.00846	0.00947
0.00031	0.00067	0.00034	0.00023	0.00016	0.00074	0.00024	0.0002	0.00018	0.00018	0.00012	0.00011	<0.00010	<0.00010	0.00017	<0.00010

SW			SW-H												
BC-04			BC-05												
Creek d/s from Lucky Pit			Pacific Creek u/s from confluence w/ Lee Creek												
7/25/2012	9/19/2012	10/15/2012	1/30/2012	3/29/2012	4/21/2012	5/23/2012	6/19/2012	7/25/2012	8/28/2012	9/18/2012	10/18/2012	12/17/2012	1/30/2012	2/28/2012	3/28/2012
7.96	7.68	7.7	7.78	7.58	7.84	5.23	7.98	8.20	7.84	7.88	8.02	8.6		8.01	7.56
8.09	8.23	8.05		8.32	7.75	7.83	8.08	8.06	8.31	8.11	8.1	8.13	8.03	7.93	8.26
		360				113					303	522			
606.0	701.3	677	106.5	803.8	190.3		350.5	485.0	459.9	586	581	522999.0	360.8	286.7	408.1
572	693	662		928	188	199	372	458	557	571	528	831	339	382	617
4.0	1.2	0.5	-0.1	0	0	0.07	3.5	4.2	3.2	0.9	0.01	0	0	0	0.5
14.1	14.05	13.75	8.99	8.9	15.5	15.24	13.56	13.4	12.26	14.3	12.93	3.2	11.23		10
108	99.4	95.6	60.7	61	106.4		102.0	103	91.7	100.7	88.4	24	77.6		77
148.5	45.4	-29.2	204.6	293.1	138.4	253.3	75.5	93.1		95.6	29.6	170.8	226.9	118.3	248.6
38	41		0			463	259	183	166	231					
							0.308	0.250	0.245	2.000	0.265				
36.3	11.9	13.7		<1.0	1.8	26.2	7.8	4	13.9	1	1.8	33.1	<1.0	<1.0	<1.0
426	482	440		650	158	134	254	348	410	430	378	562	182	236	394
						141									
307	369	371		524	88.7	96.2	197	249	270	298	270	405	180	187	311
303	385	345		538	98.2	96.9	192	245	287	322	269	512	149	197	327
129	165	154		260	46.9	59.6	106	135	158	158	141	249	96.9	108	156
158	201	188		312	57.2	72.8	129	165	192	193	172	303	118	132	190
<0.50	<0.50	<0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
<0.50	<0.50	<0.50		2.46	<0.50	<0.50	<0.50	<0.50	0.66	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
<0.50	<0.50	<0.50		2.05	<0.50	<0.50	<0.50	<0.50	0.55	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
0.58	<0.50	0.9		1.2	0.62	1.1	<0.50	0.74	<0.50	<0.50	0.7	1.2	<0.5	<0.5	0.7
0.29	0.33	0.31		0.32	0.13	0.18	0.33	0.29	0.3	0.31	0.18	0.27	0.071	0.095	0.16
162	189	195		224	46.5	37.7	87.2	106	132	152	138	195	75.1	87.1	160
1	1.1			1.1				1	0.98	1			0.87	1	1
0.019	0.021	0.019		0.028	0.021	0.028	0.0072	0.016	0.019	0.014	0.012	0.019	<0.0050	0.013	0.026
<0.050	<0.050	<0.0050		<0.005	<0.050	<0.0050	<0.0050	<0.050	<0.050	<0.050	<0.0050	<0.0050	<0.005	<0.05	<0.005
<0.20	<0.20	0.182		0.066	<0.20	0.094	0.112	<0.20	<0.20	<0.20	0.257	0.212	0.251	0.26	0.351
<0.20	<0.20	0.182		0.066	<0.20	0.094	0.112	<0.20	<0.20	<0.20	0.257	0.212	0.251	0.26	0.351
3.71	2.54	2.6		3.15	21.2	13.2	10.5	9.14	6.12	7.57	3.75	6.58	1.95	0.73	1.73
4.15	2.82	2.9		3.45	25.2	15.5	10.7	9.05	7.65	7.09	4.36	6.35	1.14	1.34	1.89
<0.00050	<0.00050	<0.00050		<0.00050	<0.00050	0.00055	0.00103	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
0.225	0.0678	0.12		0.0041	0.156	0.235	0.111	0.0671	0.121	0.0229	0.0185	0.18	0.0047	0.0032	0.0029
0.00354	0.00404	0.00369		0.00036	0.000318	0.000408	0.000543	0.00052	0.000477	0.000441	0.000235	0.000428	0.00015	0.00017	0.00023
0.00404	0.00276	0.00331		0.00026	0.000605	0.00122	0.000771	0.000711	0.000851	0.00056	0.000226	0.00078	0.0005	0.00047	0.00023
0.103	0.0886	0.0871		0.0759	0.0446	0.0696	0.0683	0.077	0.0878	0.0794	0.0508	0.0743	0.0678	0.0669	0.0552
0.00002	<0.000010	0.00001		<0.00001	0.000015	0.000024	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.000016	<0.00001	<0.00001	<0.00001
<0.0000050	<0.0000050	<0.0000050		<0.000005	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	<0.000005	<0.000005
<0.050	<0.05	<0.05		<0.05	<0.050	<0.05	<0.05	<0.050	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
0.000209	0.000159	0.000177		0.000121	0.000117	0.000205	0.0000806	0.000085	0.000106	0.000056	0.000092	0.00019	0.000036	0.000042	0.000111

71.4	87.1	88.1		127	22.3	23.6	48.2	61.4	66.9	73.5	67	100	48.6	50.4	76.9
0.00039	0.00021	0.00031		<0.0001	0.00032	0.00052	0.00037	0.0002	0.00024	0.00016	<0.00010	0.00052	<0.0001	<0.0001	<0.0001
0.00159	0.00138	0.0015		0.000024	0.000214	0.000535	0.000213	0.000147	0.000272	0.000105	0.000048	0.000355	0.000023	0.00002	0.000015
0.00138	0.000878	0.000935		0.00094	0.00227	0.00342	0.00266	0.00174	0.0019	0.00679	0.00112	0.00307	0.00035	0.00039	0.00056
0.798	0.446	0.756		0.013	0.175	0.637	0.297	0.253	0.435	0.135	0.0465	0.541	0.015	0.014	0.011
0.000441	0.000168	0.000183		0.000024	0.0000757	0.000268	0.000164	0.000068	0.00015	0.000025	0.000022	0.000343	0.000026	0.000017	0.000006
0.00885	0.0084	0.00855		0.0075	0.00175	0.00246	0.0038	0.00426	0.00458	0.00492	0.00254	0.00519	0.0022	0.0025	0.0024
31.3	36.9	36.7		50.4	8.02	9.03	18.5	23.1	25.1	27.9	24.8	37.5	14.2	14.9	28.8
0.148	0.162	0.176		0.021	0.0252	0.098	0.0363	0.0294	0.0521	0.0315	0.00667	0.0806	0.00505	0.00451	0.00379
<0.000010	<0.000010	<0.000010		<0.00001	0.000012			<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	<0.00001	<0.00001
0.00253	0.00275	0.00254		0.00263	0.000823	0.00146	0.00224	0.00286	0.00269	0.00305	0.00146	0.00193	0.00044	0.00081	0.00143
0.00865	0.0087	0.00984		0.00215	0.00409	0.0064	0.00516	0.00384	0.00401	0.00303	0.002	0.00344	0.0005	0.00066	0.00163
0.0279	0.0145			0.01	0.0722			0.0121	0.0213	0.0119			<0.002	0.005	0.009
1.2	1.41	1.33		1.32	1.39	0.662	0.627	0.678	0.73	0.823	0.687	0.983	0.55	0.61	0.78
0.00429	0.00344	0.00349		0.00205	0.000704	0.00109	0.00195	0.00182	0.00162	0.00201	0.00227	0.00138	0.0009	0.00116	0.00263
3.85	3.57	3.91		4.35	2.36	2.26	3.48	3.81	3.52	3.82	3.38	4.34	3.22	2.99	3.13
0.000007	<0.0000050	<0.0000050		<0.000005	0.0000242	0.0000188	0.0000073	<0.0000050	0.000007	<0.0000050	<0.0000050	0.000008	<0.000005	<0.000005	<0.000005
2.36	2	2.19		2.5	0.886	0.617	1.27	1.55	1.57	1.83	1.48	2.36	2.77	2.62	1.75
0.472	0.52	0.503		0.475	0.0834	0.0973	0.186	0.248	0.27	0.289	0.293	0.386	0.25	0.261	0.313
63	77	74		102	13	13	30	39	46	54	48	67.8	30	31	63
0.000015	0.000011	0.000009		0.000003	0.000004	0.000007	0.0000028	0.000003	0.000004	0.000002	0.000003	0.000006	<0.000002	<0.000002	<0.000002
<0.00020	<0.00020	<0.00020		<0.0002	<0.00020	<0.00020	0.00029	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0002	<0.0002	<0.0002
0.00606	0.00276	0.00361		<0.0005	0.00361	0.00692	0.00254	0.0018	0.00428	0.00051	<0.00050	0.0043	<0.0005	<0.0005	<0.0005
0.00289	0.0037	0.00363		0.00469	0.000502	0.000588	0.00127	0.00162	0.00213	0.00228	0.00187	0.00332	0.00118	0.00139	0.00275
0.00301	0.00139	0.00224		0.0003	0.00102	0.00327	0.00172	0.00142	0.00189	0.00083	0.00064	0.00228	0.0006	0.0002	0.0003
0.0173	0.0153	0.0188		0.011	0.0243	0.0291	0.0196	0.0127	0.0152	0.00828	0.00899	0.0228	0.0019	0.0025	0.0074
0.00014	<0.00010	<0.00010		<0.0001	0.00042	0.00036	0.00023	0.00019	0.00019	0.00014	<0.00010	0.00017	<0.0001	<0.0001	<0.0001
0.0228	0.00981	0.0108		0.0027	0.104	0.0582	0.0257	0.0237	0.0148	0.0124	0.00492	0.0046	0.0019	0.0012	0.0023
0.0035	0.00428	0.00362		0.00037	0.000327	0.00039	0.000522	0.0005	0.000483	0.000464	0.000227	0.000526	0.00016	0.00017	0.00023
0.00259	0.00208	0.00175		0.00021	0.000597	0.000658	0.000634	0.000602	0.000577	0.000557	0.000177	0.000445	0.00038	0.00043	0.00016
0.0864	0.0897	0.0786		0.0687	0.0436	0.0405	0.0576	0.0713	0.0808	0.0825	0.047	0.0764	0.0623	0.0616	0.0508
<0.000010	<0.000010	<0.000010		<0.00001	0.000012	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	<0.00001	<0.00001
<0.0000050	<0.0000050	<0.0000050		<0.000005	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	<0.000005	<0.000005
<0.050	<0.05	<0.05		<0.05	<0.050	<0.05	<0.05	<0.050	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
0.000106	0.000131	0.000118		0.000132	0.000099	0.0000537	0.0000544	0.00005	0.000039	0.00005	0.000089	0.000102	0.000025	0.00004	0.000099
70.8	90.8	81		131	25	24.3	46.6	59.7	72	80.3	67.1	123	40.8	54.1	83
0.00015	0.00012	<0.00010		<0.0001	0.00032	0.00018	0.00024	0.00018	0.00011	0.00015	0.00012	0.00012	<0.0001	<0.0001	<0.0001
0.00131	0.00128	0.00131		0.000028	0.000216	0.000164	0.0000813	0.000082	0.00009	0.000106	0.00003	0.000034	0.00002	0.000016	0.000025
0.000686	0.00109	0.000456		0.00101	0.00229	0.00243	0.00205	0.0015	0.00132	0.00118	0.00114	0.00251	0.00036	0.00043	0.00057
0.292	0.22	0.2		0.009	0.159	0.164	0.116	0.128	0.108	0.101	0.0196	0.0155	0.004	0.008	0.006
0.00002	0.000022	0.000007		0.000023	0.0000348	0.000054	0.000036	0.000008	0.000024	0.000009	0.000013	0.000059	<0.000005	0.000008	0.00001
0.00879	0.00895	0.00813		0.0077	0.00177	0.00205	0.00345	0.00431	0.00469	0.0052	0.0024	0.0065	0.0019	0.0023	0.0026
30.6	38.5	34.7		51	8.7	8.79	18.4	23.3	26.1	29.5	24.7	46.4	11.4	15.1	29.1
0.135	0.163	0.164		0.0211	0.0253	0.0178	0.0111	0.0174	0.0255	0.0307	0.0052	0.00195	0.00384	0.0041	0.00362
<0.000010	<0.000010	<0.000010		<0.00001	<0.000010			<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	<0.00001	<0.00001
0.00289	0.00307	0.00274		0.00261	0.000923	0.00161	0.00239	0.00294	0.00292	0.00328	0.00143	0.00289	0.00044	0.00086	0.00156
0.00784	0.00881	0.00858		0.00228	0.00412	0.00484	0.00436	0.00354	0.00301	0.00318	0.00189	0.00326	0.00043	0.0006	0.00156

0.0076	0.0081			0.01	0.0616			0.0099	0.009	0.0105			0.002	0.005	0.007
1.17	1.46	1.25		1.32	1.47	0.711	0.684	0.665	0.751	0.864	0.678	1.23	0.46	0.63	0.77
0.00446	0.00377	0.00367		0.00216	0.000704	0.00104	0.00185	0.00169	0.00179	0.00166	0.00271	0.00168	0.00087	0.00131	0.00265
3.65	3.75	3.55		4.45	2.6	2.02	3.22	3.59	3.86	4.07	3.31	5.22	2.72	3.25	3.33
<0.0000050	<0.0000050	<0.0000050		<0.000005	0.0000172	0.0000077	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	<0.000005	<0.000005
2.25	2.09	2.11		2.68	1	0.693	1.45	1.52	1.65	1.92	1.51	2.96	2.26	2.68	1.83
0.473	0.562	0.489		0.473	0.09	0.0989	0.181	0.241	0.274	0.304	0.279	0.487	0.224	0.25	0.312
62	77	75		101	16	12	30	40	48	56	47	85.5	25	32	58
0.000009	0.000009	0.000008		0.000004	0.0000038	0.0000022	0.0000031	0.000002	<0.0000020	0.000003	0.000003	0.000005	<0.000002	<0.000002	0.000003
<0.00020	0.00027	<0.00020		<0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00023	<0.0002	<0.0002	<0.0002
<0.00050	<0.00050	<0.00050		<0.0005	0.00147	0.00083	0.00067	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005
0.00281	0.00401	0.00365		0.0049	0.000558	0.000527	0.00125	0.0016	0.00224	0.00238	0.00174	0.00407	0.00105	0.00137	0.00292
0.00148	0.0008	0.00067		0.0005	0.00083	0.00141	0.00063	0.00115	0.00071	0.00072	0.00052	0.00103	<0.0002	<0.0002	0.0005
0.0105	0.0128	0.0139		0.0117	0.0245	0.0156	0.0101	0.00893	0.00639	0.00755	0.00806	0.0115	0.0022	0.0029	0.0082
0.0001	<0.00010	<0.00010		<0.0001	0.00037	0.00021	0.00021	0.00015	0.00014	0.00014	<0.00010	0.00017	<0.0001	<0.0001	<0.0001

SW										SW		SW		SW	
BC-06										BC-10		BC-12		BC-15	
South Klondike R. d/s from confluence w/ Lee Creek										Kokanee Pit and Dump		Blue Pit		Moosehead Pit discharge	
4/21/2012	5/23/2012	6/20/2012	7/25/2012	8/28/2012	9/18/2012	10/18/2012	12/17/2012	1/23/2013	2/12/2013	6/19/2012	1/24/2013	6/19/2012	2/13/2013	6/19/2012	2/13/2013
7.65	6.9	7.8	8.02	7.63	7.09	7.55	7.77	7.73	8.36	8.31			8.35	8.11	8.23
7.96	7.89	8.14	8.02	8.22	8.03	7.8	7.99	7.97	7.95	8.03	8.13	4.85	6.66	8.01	8.07
	154					174	188.7			234				244	
298.1		335.3	257.4	341.4	352.1	303	358.5	394	410				1643		1178
297	245	360	244	412	371	298	321	371	338	342	529	1410	1180	543	1170
0.7	3.25	5.6	9.9	5.8	4.4	2.74	0.2	0.56	1.6	14.7			1.9	17.0	1.92
15.32	13.33	13.04	11.7	11.04	9.1	9.44	1.7	7.57		6.87			3.95	8.65	5.34
106.8		103.9	103	88.3	70.1	69.8	13	55.8					31.8		43.9
138.3	161.1	123.4	118.9		89	26.5	147.9			110				236.5	
5.3	33.1	4.1	1.7	1.8	<1.0	<1.0	27.2	<1.0	<1.0	4.2	<1.0	7.1	3.4	5.1	<1.0
196	162	230	166	280	260	204	208	210	218	342	308	1280	964	469	882
	172									116.867				121.861	
131	119	182	122	191	185	143	155	185	154	170	280	796	604	272	620
148	119	176	122	204	186	149	178	185	154	158	289	813	610	273	640
79.6	68.8	105	76.2	122	111	91.6	98.3	107	98.4	91.6	169	<0.50	46	78.5	166
97.1	83.9	128	93	149	136	112	120	130	120	112	206	<0.50	56.1	95.8	202
<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
0.52	0.95	<0.50	0.61	<0.50	<0.50	0.61	<0.50	0.79	1.1	<0.50	1	0.77	1.1	<0.50	0.68
0.074	0.14	0.2	0.07	0.15	0.13	0.092	0.071	0.1	0.083	0.17	0.13	0.47	0.22	0.12	0.092
67.1	49.8	74.1	43	92	83.6	62.1	65.5	82.7	73.1	80.9	111	816	616	188	504
1				0.96	0.97			0.99			1				
0.03	0.021	0.04	0.0075	0.017	0.019	0.012	<0.0050	0.014	0.01	0.011	0.056	0.035	0.099	0.0054	0.016
<0.050	<0.0050	<0.0050	<0.050	<0.050	<0.050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050
<0.050	0.307	0.236	<0.20	<0.20	<0.20	0.112	0.164	0.233	0.2	<0.020	0.263	0.348	0.03	0.219	0.056
<0.020	0.307	0.236	<0.20	<0.20	<0.20	0.112	0.164	0.233	0.2	<0.020	0.263	0.348	0.03	0.219	0.056
7.56	13.8	3.34	2.84	1.97	1.82	1.3	0.95	1.42	1.35	1.09	0.9	1.33	1.29	0.55	1.58
7.08	11.7	3.37	2.59	2.45	2.69	1.16	1.1	1.72	2.03	1.06	1.93	0.75	2.09	1.36	1.93
<0.00050	<0.00050	0.00113	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00069	<0.00050	<0.00050	<0.00050	0.0007	<0.00050	<0.00050	<0.00050
0.0551	0.301	0.0718	0.0234	0.0152	0.0167	0.00447	0.00224	0.00352	0.00231	0.048	0.0141	3.77	0.501	0.0507	0.00252
0.000176	0.000348	0.000254	0.00019	0.000219	0.000182	0.000164	0.000148	0.000179	0.000212	0.0857	0.153	0.0309	0.00924	0.00585	0.00398
0.00119	0.000883	0.000334	0.000708	0.000377	0.000378	0.000288	0.000256	0.000461	0.00024	0.014	0.0191	0.011	0.15	0.0547	0.0341
0.0576	0.0691	0.0484	0.0531	0.0498	0.0713	0.0688	0.0748	0.0659	0.0779	0.113	0.0707	0.0469	0.00656	0.0896	0.0395
<0.000010	0.000026	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.00813	0.00131	<0.000010	<0.000010
<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000025	<0.0000050	<0.0000050	<0.0000050
<0.050	<0.05	<0.05	<0.050	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.25	<0.05	<0.05	<0.05
0.0000616	0.000325	0.0000958	0.000029	0.000065	0.000331	0.000029	0.000029	0.00004	0.000038	0.0000469	0.000028	0.00569	0.00146	0.0000328	0.000039

35.1	30.1	45.7	33.6	49.3	48.9	38.6	41.8	49.9	40.4	40.8	67.2	196	148	61.5	136
0.00012	0.0007	0.00021	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00016	<0.00010	0.00175	<0.00010	0.00016	<0.00010
0.000102	0.000474	0.000095	0.000048	0.00005	0.000065	0.000028	0.000024	0.000021	0.00002	0.0000707	0.000017	0.0675	0.0334	0.0000674	0.000029
0.000986	0.00436	0.00146	0.00067	0.000932	0.00166	0.000264	0.000311	0.000421	0.00029	0.000889	0.000298	0.183	0.0217	0.000371	0.00021
0.122	0.732	0.119	0.0518	0.0579	0.0459	0.0195	0.0079	0.017	0.0059	0.0785	0.0118	2.49	3.24	0.0475	0.005
0.0000933	0.000482	0.0000745	0.000061	0.000036	0.000062	0.000007	0.000005	0.000011	0.000009	0.0000774	0.000019	0.000108	0.000007	0.000155	0.000014
0.00194	0.00184	0.00212	0.00209	0.00237	0.00272	0.00238	0.00295	0.00242	0.00278	0.00239	0.00343	0.0112	0.00695	0.00102	0.00139
10.5	10.7	16.4	9.2	16.6	15.3	11.3	12.3	14.8	13	16.5	27.2	74.3	56.9	28.8	68.4
0.0198	0.0573	0.00976	0.00767	0.0086	0.0108	0.00366	0.00389	0.00522	0.00219	0.0212	0.0164	2.32	1.48	0.00468	0.00807
<0.000010			<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010		<0.000010		<0.000010		<0.000010
0.00042	0.00108	0.00119	0.000457	0.00113	0.000775	0.000577	0.00038	0.000707	0.000488	0.00338	0.00449	0.00095	0.000361	0.000907	0.00101
0.00102	0.005	0.00209	0.00057	0.00131	0.00139	0.000433	0.000418	0.000673	0.000455	0.000974	0.000345	0.21	0.0984	0.000662	0.000671
0.0167			0.0035	0.0058	0.0149										
0.735	0.918	0.596	0.452	0.647	0.751	0.603	0.642	0.589	0.67	1.47	1.51	2.58	2.47	0.797	1.02
0.000759	0.00146	0.00199	0.000553	0.00161	0.00115	0.00091	0.000703	0.00116	0.000739	0.00478	0.00708	0.00392	0.000306	0.0132	0.0231
2.52	2.8	3.16	2.99	2.91	3.23	3.17	3.23	3.35	2.83	1.87	2.86	7	3.4	1.64	1.86
<0.0000050	0.0000393	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.000007	<0.000025	<0.0000050	0.0000081	<0.0000050
1.95	1.91	1.43	1.93	1.83	2.53	2.95	3.52	2.74	3.44	0.584	0.818	1.37	1.21	0.333	0.578
0.189	0.123	0.193	0.205	0.236	0.245	0.213	0.238	0.256	0.257	0.331	0.561	1.23	1.06	0.572	1.35
20	19	28	17	31	28	20	23.1	29.6	23.4	30	40.8	278	200	69	175
<0.0000020	0.000011	0.0000028	<0.0000020	0.000002	0.000002	<0.0000020	0.000002	<0.0000020	<0.0000020	0.0000613	0.000086	0.000128	0.00014	0.0000417	0.00004
<0.00020	<0.00020	<0.00020	<0.00020	0.00059	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00259	<0.00020	<0.0010	<0.00020	<0.00020	<0.00020
0.00157	0.0103	0.00182	0.00078	<0.00050	0.00052	<0.00050	<0.00050	<0.00050	<0.00050	0.00074	<0.00050	<0.0025	<0.00050	0.00071	<0.00050
0.000954	0.000705	0.000926	0.000461	0.00118	0.000842	0.000582	0.000576	0.00123	0.000713	0.00571	0.0102	0.00929	0.000912	0.00148	0.00611
0.00033	0.00474	0.00122	0.00027	0.00055	0.00032	<0.00020	<0.00020	0.00037	<0.00020	0.00043	0.00023	0.001	<0.00020	0.00024	<0.00020
0.00435	0.0253	0.00665	0.00211	0.00439	0.0157	0.00136	0.00153	0.0029	0.00168	0.00284	0.00101	0.566	0.161	0.00112	0.00091
0.00012	0.00042	0.00015	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00050	<0.00010	<0.00010	<0.00010
0.0232	0.0289	0.0108	0.00815	0.00479	0.00264	0.00183	0.00129	0.00123	0.00087	0.0107	0.00245	2.92	0.435	0.00842	0.00135
0.000201	0.000281	0.000239	0.000188	0.000223	0.000195	0.000158	0.000177	0.000162	0.000142	0.0841	0.161	0.0303	0.00894	0.00597	0.00387
0.000983	0.000356	0.000238	0.000667	0.000352	0.000285	0.000288	0.000312	0.000469	0.000256	0.0157	0.0192	0.00261	0.13	0.0488	0.0321
0.0602	0.0359	0.0423	0.0515	0.0508	0.0616	0.0646	0.0868	0.0654	0.0724	0.113	0.0729	0.0462	0.00648	0.0777	0.0393
<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.00693	0.00137	<0.000010	<0.000010
<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000025	<0.0000050	<0.0000050	<0.0000050
<0.050	<0.05	<0.05	<0.050	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.25	<0.05	<0.05	<0.05
0.0000627	0.0000966	0.0000684	0.000022	0.000057	0.000045	0.000032	0.000039	0.000041	0.000036	0.0000197	0.000026	0.00585	0.00149	0.0000203	0.000024
39	29.9	43.7	33.8	52.6	49.3	40.6	48.1	49.6	41.7	36.7	69	204	148	58.6	142
0.00011	0.00014	0.00012	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00018	<0.00010	<0.00050	<0.00010	0.00019	<0.00010
0.0000657	0.000101	0.0000358	0.000032	0.000026	0.000023	0.000031	0.000028	0.000021	0.000024	0.0000884	0.000015	0.0667	0.0345	0.0000267	0.000019
0.000906	0.00246	0.00112	0.00056	0.000906	0.000552	0.000374	0.000427	0.000424	0.000265	0.000462	0.000463	0.169	0.0225	0.000206	0.000149
0.0575	0.0959	0.0209	0.0186	0.0229	0.0099	0.0093	0.0037	0.0076	0.0055	0.0624	0.0027	1.93	3.01	0.002	0.0018
0.0000313	0.0000223	0.0000107	0.000007	0.000017	0.000007	0.000024	0.000011	<0.0000050	0.000005	0.0000254	0.000008	0.00009	0.000008	0.0000116	0.000005
0.00207	0.00141	0.00195	0.00214	0.00238	0.00279	0.00249	0.00357	0.00237	0.00284	0.00248	0.00359	0.0119	0.00709	0.00107	0.00142
12.3	10.8	16.3	9.22	17.7	15.3	11.7	14.1	14.9	12.2	16.2	28.4	73.9	58.5	30.6	69.5
0.0143	0.0138	0.00458	0.00556	0.00646	0.0028	0.00404	0.00604	0.00449	0.00166	0.0665	0.0133	2.37	1.56	0.00129	0.00654
<0.000010			<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010		<0.000010		<0.000010		<0.000010
0.000475	0.00107	0.00128	0.000468	0.00117	0.000852	0.00068	0.000496	0.000659	0.000448	0.00369	0.00482	0.00041	0.000323	0.00107	0.000968
0.00104	0.00302	0.00181	0.000587	0.00137	0.000776	0.000406	0.000518	0.000697	0.000448	0.000881	0.000384	0.208	0.103	0.000517	0.000689

0.0118			<0.0020	0.0036	0.0042										
0.853	0.857	0.593	0.442	0.667	0.717	0.632	0.745	0.58	0.635	1.48	1.57	2.6	2.43	0.852	1.05
0.000758	0.00147	0.00186	0.000567	0.0017	0.00118	0.000758	0.000679	0.00117	0.000717	0.00435	0.0077	0.00421	0.000138	0.013	0.0208
2.78	2.25	2.94	2.95	3.11	3.36	3.38	3.77	3.62	2.98	1.67	2.95	7.27	3.32	1.5	1.98
<0.0000050	0.0000066	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000025	<0.0000050	<0.0000050	<0.0000050
2.24	0.863	1.38	1.9	1.91	2.65	2.98	4.07	2.81	3.17	0.591	0.871	1.35	1.24	0.388	0.59
0.214	0.123	0.189	0.207	0.248	0.236	0.209	0.278	0.242	0.242	0.322	0.583	1.22	1.03	0.557	1.38
25	18	30	17	33	28	21	27.1	25.9	23.6	31	43.2	287	203	76	167
<0.0000020	0.0000031	0.0000033	0.000002	0.000002	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	0.0000606	0.00009	0.00014	0.000144	0.0000368	0.000046
0.00024	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00028	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0010	<0.00020	<0.00020	<0.00020
<0.00050	0.00061	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0025	<0.00050	<0.00050	<0.00050
0.00117	0.000616	0.00092	0.000474	0.00123	0.000873	0.000594	0.000639	0.00119	0.000682	0.00579	0.0108	0.00866	0.00093	0.00152	0.0062
0.00031	0.00145	0.00048	0.00021	0.00028	0.00029	<0.00020	<0.00020	0.00024	<0.00020	<0.00020	<0.00020	0.0027	<0.00020	<0.00020	<0.00020
0.00471	0.00797	0.00539	0.0012	0.00408	0.00282	0.00155	0.00227	0.00266	0.00165	0.0009	0.00113	0.563	0.171	0.00105	0.00084
<0.00010	0.00014	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00050	<0.00010	<0.00010	<0.00010

SW	SW		GW		GW		GW			GW	SW		SW
BC-16	BC-17		BC-19		BC-21		BC-22			BC-27	BC-28		BC-28a
Pacific Gulch	Golden Pit and Dump		Piezometer RC94-843		Piezometer RC95-1354		Piezometer RC95-1357			Piezometer RC97-2026	Overflow Pond decant		Discharge from heap
6/20/2012	6/19/2012	2/13/2013	10/17/2012	1/20/2013	7/24/2012	1/19/2013	10/22/2012	1/20/2013	1/21/2013	7/26/2012	6/14/2012	9/6/2012	6/14/2012
5.51	6.74	8.35	6.88				6.16				8.73		7.58
5.56	8.05	8.02	7.12	7.44	7.69	7.64	6.79	7.09	5.82	7.89	7.77	7.84	8.2
454	285		406								1573		585
		621	753				1415						
464	407	679	812	881	1470	862	1380	1270	11600	799	1600	2150	710
9.4		2.15	0.89				2.05				17.5		17.6
12.15	12.16	5.49	5.5								7.58		9.18
		46.9	38.6										
273	115.2		41.8								85		194.1
32.6	2.3	<1.0			5					<4.0	2	4.4	1.1
382	256	464			1130					554	1210	1130	480
226.741	193.779										786.102		193.879
205	203	328	417	445		437	718	689	8800		430	585	185
206	191	355	415	447	851	453	759	685	8750	430	439	569	189
0.5	115	187	240	248	316	253	132	127	56	171	53.8	55.4	62.9
0.61	140	228	292	302	385	308	162	155	68.3	209	65.6	67.6	76.8
<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
0.71	0.64	1	1.4	0.93	2	2.5	1.5	1.4	2.4	0.97	13	16	6.5
0.59	0.17	0.26	0.51	0.5		0.26	0.3	0.3	2.6		0.17	0.2	0.17
212	82	170	197	209	548	236	668	563	12600	243	323	387	127
				1	1	0.95		1	0.88	1			
0.01	0.03	0.022	0.027	0.014	0.24	0.094	0.015	0.11	7.9	0.062	0.057	0.19	0.052
<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	<0.0050	<0.0050	<0.0050	<0.0050	<0.050	0.274	0.462	0.221
0.388	3.07	0.113	0.199	0.206	<0.20	0.027	2.23	2.62	0.239	<0.20	125	161	44.4
0.388	3.07	0.113	0.199	0.206	<0.20	0.027	2.23	2.62	0.239	<0.20	125	162	44.6
2.09	1.26	0.74	1.75	<0.50		<0.50	1.48	1.36	4.85		4.99	7.01	5.76
4.27	1.33	1.21	1.08	1.2		0.79	1.07	1.81	5.79		5.6	6.42	5.94
					<0.00050					0.00053			
0.00055	<0.00050	0.00071	0.00066	<0.00050	<0.00050	<0.00050	0.00177	<0.00050	<0.00050	<0.00050	0.0166	0.0202	0.00602
4.09	0.00827	0.00431	0.492	0.0132		0.00143	0.82	0.138	8.77		0.0385	0.129	0.0374
0.0387	0.251	0.0337	0.000869	0.000223		0.000189	0.000276	0.000084	0.00065		0.668	0.965	0.332
0.124	0.0504	0.0211	0.00401	0.000521		0.0109	0.00158	0.000253	0.0519		0.0554	0.087	0.0406
0.0827	0.106	0.0442	0.02	0.00183		0.047	0.0538	0.0331	0.014		0.133	0.11	0.113
0.00949	<0.000010	<0.000010	0.000073	<0.000010		<0.000010	0.000171	0.000063	0.00197		<0.000010	<0.000050	<0.000010
<0.0000050	<0.0000050	<0.0000050	0.000022	<0.0000050		<0.0000050	<0.0000050	<0.0000050	<0.00010		<0.0000050	<0.000025	<0.0000050
<0.05	<0.05	<0.05	<0.05	<0.05		<0.05	<0.05	<0.05	<1		<0.05	<0.25	<0.05
0.00417	0.0000548	0.000022	0.000342	0.000312		0.000125	0.00575	0.00538	0.00081		<0.0000050	<0.000025	0.0000349

48.8	53.9	79.4	94.9	99.9		86.4	173	170	323		126	169	56.5
0.00089	0.00024	<0.00010	0.00179	0.00032		0.00029	0.00227	0.00027	<0.0020		0.00019	0.00063	0.00017
0.0157	0.0000327	0.000206	0.000526	0.000138		0.00223	0.00349	0.00212	1.22		0.189	0.323	0.0907
0.106	0.000418	0.000133	0.0118	0.000322		0.000238	0.00421	0.000472	0.003		0.00179	0.0014	0.00183
0.72	0.0252	0.0427	0.966	0.0217		0.122	0.903	0.0605	1270		0.0253	0.112	0.0364
0.00121	0.0000606	0.000017	0.00386	0.000077		0.000057	0.0028	0.00011	0.00239		0.0000785	0.00018	0.0000949
0.00809	0.00281	0.00873	0.0315	0.0278		0.027	0.0523	0.0538	0.37		0.00132	0.0025	0.00131
20.3	16.5	31.4	43.7	47.5		53.8	69.5	64.2	1940		28.2	39.7	10.7
1.38	0.00433	0.0893	0.039	0.166		1.24	0.267	0.205	22.1		0.00257	0.0148	0.00523
		<0.000010	<0.000010	<0.000010		<0.000010	0.00001	<0.000010	<0.00020		<0.000010	<0.010	<0.000010
0.000248	0.0072	0.0107	0.000235	0.000195		0.000276	0.000297	0.000161	<0.0010		0.0111	0.0153	0.00697
0.135	0.00323	0.0015	0.00302	0.0018		0.00463	0.0528	0.0403	7.08		0.00168	0.0033	0.00139
2.4	0.93	1.24	2.35	2.26		3.24	3.88	3.9	21.2		3.45	4.51	3.57
0.00474	0.0107	0.00373	0.00389	0.00463		0.00247	0.0482	0.0464	0.00534		0.0599	0.0933	0.033
7.55	3.86	3.68	8.18	6.88		4.38	16.6	17.5	6.78		0.713	<0.5	0.539
0.000106	<0.0000050	<0.0000050	0.000125	<0.0000050		<0.0000050	0.000066	0.000006	<0.00010		0.0000084	<0.000025	0.0000106
0.863	1.4	1.73	9.35	9.23		7.87	21.9	20.1	132		173	235	67.1
0.272	0.301	0.572	0.342	0.362		0.38	0.478	0.462	1.11		0.604	0.806	0.229
75	28	58.8	73	83.8		78	223	220	3770		113	158	42
0.000101	0.0000839	0.000037	0.000019	0.000006		0.000023	0.000042	0.000027	<0.000040		0.0000379	0.000088	0.0000236
<0.00020	0.00042	<0.00020	0.00044	<0.00020		0.00021	0.00029	<0.00020	<0.0040		<0.00020	<0.0010	<0.00020
0.00933	<0.00050	<0.00050	0.0156	0.00086		<0.00050	0.014	0.00055	<0.01		0.00134	0.0044	0.00132
0.00115	0.00557	0.0101	0.00064	0.00056		0.00137	0.000726	0.000203	0.00293		0.0065	0.00887	0.00168
0.00203	0.00025	<0.00020	0.00137	<0.00020		<0.00020	0.00502	<0.00020	<0.0040		<0.00020	0.0021	<0.00020
0.754	0.0202	0.00298	0.0301	0.0195		0.0553	0.107	0.0863	26.8		0.00177	0.00293	0.00188
0.00062	<0.00010	<0.00010	0.00045	<0.00010		<0.00010	0.00051	<0.00010	<0.0020		<0.00010	<0.00050	0.00014
0.923	0.00301	0.00106	0.00535	0.00137	0.0051	0.00104	0.125	0.115	8.31	0.00123	0.0224	0.0155	0.00586
0.036	0.251	0.0338	0.000625	0.000225	0.0005	0.0002	<0.00010	0.000069	<0.00040	0.00212	0.672	0.942	0.329
0.00283	0.047	0.018	0.00127	0.0005	0.0309	0.0112	0.00025	0.000182	0.0486	0.126	0.0556	0.0815	0.0406
0.0564	0.103	0.0446	0.00817	0.0017	0.0267	0.0478	0.0269	0.0307	0.0125	0.0116	0.132	0.106	0.111
0.00557	<0.000010	<0.000010	<0.000010	<0.000010	<0.000050	<0.000010	0.000068	0.000053	0.00173	<0.000010	<0.000010	<0.000050	<0.000010
<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000025	<0.0000050	<0.000025	<0.0000050	<0.00010	<0.0000050	<0.0000050	<0.000025	<0.0000050
<0.05	<0.05	<0.05	<0.05	<0.05	<0.25	<0.05	<0.25	<0.05	<1	<0.050	<0.05	<0.25	<0.05
0.00363	0.0000576	0.000019	0.000275	0.000333	0.000114	0.000123	0.00601	0.00538	0.00041	0.000026	<0.0000050	<0.000025	0.0000218
48.2	50.7	88.3	93.4	99.7	186	88.2	181	168	318	108	129	165	58.4
0.0002	0.00025	<0.00010	0.00038	0.00024	<0.00050	0.00014	0.00059	0.00024	<0.0020	0.00016	0.00015	<0.00050	0.00014
0.0154	0.0000227	0.000238	0.000215	0.000148	0.00739	0.00228	0.00286	0.00217	1.25	0.00018	0.189	0.305	0.0914
0.0637	0.000259	0.000307	0.0256	0.000232	0.00075	0.000102	<0.00025	0.000517	<0.0010	0.000479	0.00151	0.00081	0.0017
0.0132	0.0035	0.0056	0.0782	0.0049	0.429	0.102	0.215	0.0335	1280	1.49	0.0041	0.0117	0.0146
<0.0000050	0.0000234	0.000008	0.000525	0.000008	0.000026	0.000013	0.000073	0.000006	0.0004	0.000013	0.0000153	0.000038	0.000051
0.00748	0.00291	0.00883	0.0306	0.0276	0.0463	0.0279	0.0538	0.0527	0.352	0.0096	0.00138	0.0029	0.00122
20.9	15.6	32.8	44.2	48	93.9	56.6	74.6	64.2	1930	39.3	28.6	38	10.6
1.44	0.00246	0.0928	0.0276	0.165	2.98	1.26	0.252	0.205	22	0.22	0.00202	0.0083	0.00402
		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000050	<0.000010	<0.00020	0.00001		<0.010	
0.000158	0.00775	0.0115	0.000224	0.000063	0.00117	0.000209	0.000332	0.000212	<0.0010	0.0134	0.0109	0.0141	0.00695
0.136	0.00315	0.00144	0.00218	0.00182	0.0116	0.00472	0.0529	0.0401	7.2	0.0022	0.00171	0.0029	0.00126

					<0.010					0.0691			
2.44	0.931	1.36	2.44	2.3	3.81	3.46	4.11	3.81	21.6	1.3	3.52	4.34	3.61
0.00465	0.0101	0.00408	0.00404	0.00489	0.00038	0.00264	0.05	0.0459	0.00518	<0.000040	0.062	0.0952	0.0346
7.14	3.77	4.11	7.44	6.49	5.71	4.7	16.9	17.4	6.07	3.9	0.687	<0.5	0.505
<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000025	<0.0000050	<0.000025	<0.0000050	<0.00010	<0.0000050	0.0000073	<0.000025	0.0000101
0.898	1.38	1.75	9.96	9.33	9.81	8.25	23.4	20	129	1.74	174	227	66.4
0.267	0.298	0.597	0.339	0.367	0.682	0.381	0.493	0.459	1.1	0.756	0.614	0.792	0.225
76	29	61.8	74	83.2	205	83.3	224	218	3780	99	114	144	41
0.0000675	0.000089	0.00004	0.000007	0.000007	0.000042	0.000025	0.000031	0.000026	<0.000040	0.000002	0.0000408	0.000092	0.0000224
<0.00020	<0.00020	<0.00020	0.00056	<0.00020	<0.0010	<0.00020	0.0014	<0.00020	<0.0040	<0.00020	<0.00020	<0.0010	<0.00020
<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0025	<0.00050	<0.0025	<0.00050	<0.01	<0.00050	<0.00050	<0.0025	<0.00050
0.000372	0.00578	0.0109	0.000549	0.000571	0.00342	0.00141	0.000282	0.0002	0.00255	0.0106	0.00651	0.00866	0.0017
<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0010	<0.00020	<0.0010	<0.00020	<0.0040	<0.00020	<0.00020	<0.0010	<0.00020
0.759	0.0177	0.00277	0.0244	0.0197	0.252	0.0577	0.114	0.0862	27	0.0586	0.00175	0.00185	0.00218
<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00050	<0.00010	<0.00050	<0.00010	<0.0020	<0.00010	<0.00010	<0.00050	<0.00010

TS	SW-H													
BC-28b	BC-31													
Far (South) End of Biological Treatment Cell	Golden Creek above confluence w/ South Klondike R.													
6/14/2012	3/28/2012	4/23/2012	5/23/2012	6/20/2012	7/24/2012	8/28/2012	9/18/2012	10/18/2012	11/27/2012	1/29/2012	2/27/2012	3/28/2012	4/21/2012	5/24/2012
8.51		7.81	5.7	7.87	8.25	7.98	8.11	8.18	8.24	6.63	7.62	7.56	7.78	4.07
8.15		8	7.86	8.05	8.21	8.35	8.27	8.11	7.96	8.26	7.94	8.15	7.91	7.72
1977			1320					288						131
		328		387.2	425.4	452.8	330	552	241.2	16.3	554.5	619.4	342	
2320		324	217	411	444	546	594	586	744	641	691	701	340	215
17.1		0	1.88	3.0	4.3	1.7	1.2	0	0	0.1	-0.1	0	0	1.5
8.90		16.16	39.7	14.14	13.5	13.47	15.27	15.8	5.49	9.6	13.84	13	15.12	15.03
		111.3		105.2	104	96.7	108.2	104	41.3	66.6	94.5	91	103.2	
99.7		103.6	268.7	142.8	258.1		108.4	27.1	110.1	191.3	24.4	234	139.8	283.1
	0			1354	1277	862	499					486		
				0.630	0.620	0.488	0.469							
6.3		<1.0	104	11.9	9.2	3.1	1.4	2.1	4.5	1.2	<1.0	<1.0	8.5	146
1790		236	134	278	326	406	428	396	490	390	488	478	248	152
116.767			154											155
650		156	106	216	237	263	320	306	404	354	366	383	162	105
659		168	106	211	236	281	332	309	439	323	368	379	175	107
50.5		87.3	63.9	120	137	164	175	166	209	166	175	178	78.7	60
61.6		107	78	147	168	195	214	203	256	202	214	218	96	73.2
<0.50		<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
<0.50		<0.50	<0.50	<0.50	<0.50	2.75	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
<0.50		<0.50	<0.50	<0.50	<0.50	2.29	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
16		0.57	1.1	0.69	0.92	<0.50	<0.50	0.58	0.53	<0.5	<0.5	0.7	<0.50	0.85
0.2		0.14	0.13	0.26	0.2	0.23	0.25	0.24	0.21	0.27	0.17	0.16	0.12	0.13
512		82.1	41.9	100	93.1	121	144	149	190	189	170	196	95.4	40.6
		1			1	0.98	1			0.9	1.1	1	1	
0.061		0.02	0.025	0.0091	0.0063	0.021	0.023	0.011	0.0088	0.017	0.018	0.013	0.025	0.03
0.504		<0.050	<0.0050	<0.0050	<0.050	<0.050	<0.050	<0.0050	<0.0050	<0.005	<0.05	0.101	<0.050	<0.0050
171		<0.050	0.366	0.426	0.33	0.23	<0.20	0.254	0.39	0.397	0.41	0.373	<0.20	0.352
171		<0.020	0.366	0.426	0.33	0.23	<0.20	0.254	0.39	0.397	0.41	0.474	<0.20	0.352
4.39		17.2	9.2	6.85	7.92	6.04	5.01	5.44	4.07	2.36	2.45	2.32	15.3	5.5
5.31		19	7.2	7.95	7.69	5.85	4.85	5.32	3.84	2.5	1.83	2.24	15.6	17.7
0.033		<0.00050	0.00062	<0.00050	<0.00050	0.00103	<0.00050	0.00051	<0.00050	0.00071	<0.00050	<0.00050	<0.00050	<0.00050
0.0684		0.06	0.493	0.116	0.0955	0.036	0.0153	0.02	0.0197	0.0092	0.009	0.0065	0.158	0.704
1.38		0.000361	0.000739	0.000829	0.000703	0.000636	0.000661	0.000654	0.000634	0.0002	0.00025	0.00022	0.000192	0.000396
0.225		0.000549	0.00279	0.00112	0.000779	0.000695	0.0006	0.000649	0.000546	0.00023	0.00023	0.00019	0.000506	0.00159
0.0409		0.0436	0.0905	0.0658	0.0703	0.06	0.066	0.0608	0.0732	0.0509	0.0548	0.0596	0.0468	0.118
<0.000050		0.000012	0.000058	0.000017	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	<0.00001	<0.00001	<0.000010	0.000077
<0.000025		<0.0000050	0.0000076	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	<0.000005	<0.000005	<0.0000050	0.000007
<0.25		<0.050	<0.05	<0.05	<0.050	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.05
<0.000025		0.0000929	0.000277	0.0000941	0.000076	0.000052	0.000051	0.000051	0.000065	0.000129	0.000139	0.000136	0.000195	0.000822

193		37.8	25.2	52.6	56.7	64.3	76.3	72.7	96	85.5	92.4	94.9	40	25.5
<0.00050		0.00016	0.00091	0.00032	0.00022	<0.00010	0.0001	<0.00010	<0.00010	<0.0001	0.0007	<0.0001	0.00033	0.00155
0.375		0.000154	0.000927	0.000182	0.000181	0.000134	0.00009	0.000062	0.000058	0.000055	0.000058	0.000052	0.000249	0.00132
0.00254		0.0028	0.00524	0.00233	0.00203	0.00134	0.00342	0.00124	0.00176	0.00086	0.00119	0.00082	0.00245	0.00937
0.0075		0.141	1.18	0.283	0.252	0.149	0.0734	0.0614	0.0622	0.024	0.026	0.02	0.247	1.78
0.000046		0.0000867	0.00124	0.000248	0.000155	0.000085	0.000032	0.000065	0.000163	0.000019	0.00012	0.000013	0.000151	0.00142
0.0028		0.00295	0.00276	0.0042	0.00434	0.00495	0.00597	0.00544	0.00696	0.0028	0.0032	0.0031	0.00177	0.00194
40.8		15.1	10.4	20.5	23	25	31.5	30.3	40	34.1	32.8	35.4	15.1	10
0.0126		0.0177	0.0996	0.0202	0.0231	0.025	0.0201	0.011	0.0149	0.0124	0.0124	0.013	0.0329	0.137
		<0.000010			<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	<0.00001	<0.00001	<0.000010	
0.0199		0.000679	0.000765	0.00137	0.00132	0.00134	0.00155	0.00154	0.00151	0.00121	0.00136	0.00137	0.000702	0.000902
0.00506		0.00289	0.00502	0.00259	0.0024	0.00199	0.00345	0.00205	0.00223	0.00224	0.00221	0.0022	0.00378	0.00983
		0.0351			0.0137	0.0061	0.0058			0.009	0.012	0.01	0.0757	
3.86		1.52	0.906	0.729	0.764	0.837	1.03	0.929	1.18	0.81	0.87	0.84	1.49	0.882
0.106		0.00131	0.00117	0.0021	0.00189	0.00206	0.00253	0.00213	0.00216	0.00284	0.003	0.00281	0.00129	0.00148
1.06		2.58	2.67	3.66	3.75	3.48	3.8	3.91	4.29	3.53	3.45	3.54	2.65	3.13
0.000026		0.0000127	0.000041	0.0000085	0.000008	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	<0.000005	<0.000005	0.0000194	0.0000916
231		1.11	0.815	1.56	1.74	1.79	2.1	2.05	2.66	1.88	1.82	1.85	1.08	0.684
0.927		0.166	0.13	0.245	0.284	0.321	0.376	0.345	0.45	0.332	0.354	0.362	0.149	0.117
172		24	15	31	34	41	54	50	74.4	75	73	79	29	15
0.000178		0.0000049	0.000018	0.0000063	0.000005	0.000002	0.000003	0.000003	0.000002	0.000003	0.000003	0.000002	0.0000046	0.0000221
<0.0010		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00069	<0.00020	<0.00020	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020
<0.0025		0.00087	0.0153	0.00324	0.00266	0.0014	0.00063	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005	0.00409	0.0188
0.0113		0.00128	0.001	0.00174	0.00184	0.00266	0.00322	0.00313	0.00456	0.00257	0.00279	0.00304	0.00109	0.000827
<0.0010		0.00072	0.00437	0.00146	0.00148	0.00076	0.00054	0.00042	0.00053	0.001	0.0007	0.0003	0.00127	0.0102
0.00091		0.0118	0.0198	0.0062	0.00544	0.00482	0.00406	0.00458	0.00732	0.0122	0.0127	0.0115	0.0199	0.0635
<0.00050		0.00018	0.00046	0.00018	0.00021	0.00012	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	0.0003	0.00053
0.0617		0.0559	0.0495	0.0247	0.0255	0.0125	0.015	0.00822	0.00401	0.0031	0.003	0.0025	0.0665	0.033
1.36		0.000386	0.000587	0.000748	0.000724	0.000658	0.000709	0.000659	0.000678	0.00021	0.00026	0.00022	0.000193	0.000264
0.224		0.000482	0.000759	0.000623	0.000623	0.000578	0.000568	0.000516	0.000484	0.00016	0.0002	0.00019	0.000385	0.000331
0.0401		0.0476	0.0409	0.0562	0.0663	0.0642	0.0681	0.0601	0.0736	0.0497	0.0527	0.0588	0.0433	0.0308
<0.000050		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	<0.00001	<0.00001	<0.000010	<0.000010
<0.000025		<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	<0.000005	<0.000005	<0.0000050	<0.0000050
<0.25		<0.050	<0.05	<0.05	<0.050	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.05
<0.000025		0.0000933	0.000052	0.0000512	0.00006	0.00004	0.000051	0.000047	0.000058	0.000119	0.000146	0.000116	0.00014	0.0000934
195		40	25.2	50.2	56.8	68.1	78.3	73.1	111	80.5	93.8	93.7	44.4	27.2
<0.00050		0.00018	0.00014	0.00021	0.00019	<0.00010	0.00014	<0.00010	<0.00010	<0.0001	0.0011	<0.0001	0.00015	0.00014
0.373		0.000145	0.000145	0.0000942	0.0001	0.0001	0.000083	0.000043	0.000048	0.00004	0.000041	0.000041	0.000115	0.0000741
0.00231		0.00206	0.00215	0.00154	0.00163	0.00118	0.00121	0.00132	0.00088	0.00088	0.00121	0.00071	0.00183	0.00235
0.0057		0.136	0.152	0.0849	0.0885	0.0658	0.0443	0.0262	0.0167	0.01	0.008	0.007	0.107	0.103
<0.000025		0.0000295	0.0000562	0.0000169	0.000032	0.000018	0.000018	0.000039	0.000014	0.00003	0.000049	<0.000005	0.000043	0.0000399
0.0029		0.00312	0.00204	0.00408	0.00449	0.00526	0.00634	0.00545	0.00746	0.0026	0.0033	0.003	0.00184	0.00126
42		16.6	10.3	20.9	22.9	27.1	33.1	30.6	39.6	29.7	32.5	35.3	15.5	9.4
0.00919		0.0185	0.0185	0.0115	0.0168	0.0237	0.0198	0.00896	0.0116	0.0101	0.0105	0.0117	0.0202	0.00726
		<0.000010			<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	<0.00001	<0.00001	<0.000010	
0.0201		0.000705	0.000838	0.00148	0.0015	0.00141	0.00163	0.00159	0.00165	0.00121	0.00135	0.00151	0.000808	0.00099
0.00498		0.003	0.00226	0.00205	0.00214	0.00195	0.00207	0.00195	0.00224	0.00199	0.00219	0.0022	0.00307	0.00344

		0.0343			0.0074	0.0038	0.0052			0.011	0.013	0.01	0.0614	
4.01		1.65	0.841	0.772	0.759	0.897	1.07	0.958	1.12	0.76	0.89	0.85	1.52	0.74
0.107		0.00123	0.00116	0.00199	0.00194	0.00209	0.0025	0.0022	0.00262	0.0028	0.00301	0.00276	0.0013	0.00142
1.04		2.69	2.15	3.35	3.67	3.75	4.05	3.92	4.96	3.19	3.5	3.48	2.82	2.25
<0.000025		0.0000074	0.0000062	<0.0000050	0.000019	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	<0.000005	<0.000005	0.0000099	0.0000094
240		1.17	0.881	1.66	1.74	1.84	2.23	2.12	2.63	1.64	1.85	1.83	1.11	0.705
0.909		0.194	0.125	0.242	0.284	0.333	0.388	0.347	0.469	0.319	0.35	0.364	0.159	0.107
180		28	15	34	35	44	56	54	73.1	64	70	78	31	15
0.000182		0.0000038	0.0000036	0.0000029	0.000004	0.000002	0.000003	0.000002	<0.0000020	<0.000002	0.000003	<0.000002	0.0000026	0.0000044
<0.0010		<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.0002	<0.0002	<0.0002	<0.00020	<0.00020
<0.0025		0.00094	0.00085	0.00087	<0.00050	<0.00050	0.00067	<0.00050	<0.00050	<0.0005	<0.0005	<0.0005	0.00082	0.00064
0.0115		0.00153	0.000772	0.00175	0.00187	0.0027	0.00336	0.00318	0.00499	0.00249	0.00293	0.00306	0.00124	0.000489
<0.0010		0.00084	0.00096	0.00046	0.00099	0.00044	0.00053	0.00037	0.00042	0.0007	0.0006	0.0003	0.00078	0.0016
0.00135		0.0109	0.00678	0.0034	0.00374	0.00355	0.0039	0.00445	0.00584	0.0118	0.0145	0.0113	0.0156	0.00839
<0.00050		0.00019	0.00017	0.00013	0.00013	0.00011	0.0001	<0.00010	<0.00010	<0.0001	<0.0001	<0.0001	0.00023	0.00036

SW								SW							
BC-34								BC-38							
Lee Creek at Ditch Road								South Klondike R. u/s of confluence w/ Golden Ck.							
6/20/2012	**7/25/2012**	**8/28/2012**	**9/20/2012**	**10/15/2012**	**11/28/2012**	**12/18/2012**	**1/23/2013**	**2/28/2012**	**3/28/2012**	**4/23/2012**	**5/23/2012**	**6/20/2012**	**7/24/2012**	**8/29/2012**	**9/18/2012**
8.12	8.28	7.94	7.82	7.95	7.3	7.61	7.93	8.46	7.49	7.88	8.43	7.71	8.08	7.85	7.97
8.14	8.19	8.31	8.19	8.15	7.88	8.13	8.07	7.88	8.11	8.03	7.84	7.79	8.05	8.12	8.07
216				268		314.7					127				
	445.0	299.9	522.1	512	639.5	602.5	655	255	308.6	307.3		187.7	250.2	229.1	286.9
367	424	488	521	501	579	603	656	354	355	306	198	202	236	273	284
4.5	6.6	4.6	3.5	0.12	-0.1	-0.01	0.47	-0.1	0	0.2	4.53	6.7	8.6	5.6	4.2
15.32	13.3	12.34	13.79	13.78	13.09	2	8.59		11.1	15.06	12.81	12.59	12.3	12.07	13.85
	109	95.7	104	95.5	90.4	15	64.5		76	103.7			105	96	106.4
124.9	143.4		127.4	36.6	254.5	107.5		133.8	258	102.3	124.9	138.3	255.9		100.3
	3539	2134													
13.4	3.7	5.4	<1.0	16	4.3	3.8	1.2	<1.0	<1.0	6.2	40.5	8.6	3.3	4.6	<1.0
236	310	348	362	320	376	394	384	202	208	172	120	120	158	194	180
											136				
183	222	233	277	278	299	304	349	176	170	148	97.3	94.9	118	122	136
178	223	238	292	253	334	317	351	178	172	161	97.1	91.2	119	128	142
108	126	141	144	137	155	164	169	99.2	97.5	83	59.6	59.2	73.6	84.2	86.2
132	153	170	176	167	189	200	207	121	119	101	72.7	72.3	89.7	103	105
<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
<0.50	<0.50	0.97	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
<0.50	<0.50	0.81	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
<0.50	0.59	0.53	<0.50	0.63	<0.50	0.55	0.78	<0.5	<0.5	<0.50	0.83	<0.50	<0.50	<0.50	0.5
0.2	0.17	0.19	0.19	0.17	0.14	0.14	0.16	0.072	0.075	0.069	0.072	0.087	0.07	0.08	0.078
77.4	93.1	113	131	129	149	161	169	89	75.3	72.4	35.4	38.1	40.3	49.5	57.4
	1	0.93	1.1				1	0.95	1	1					
0.0082	0.0092	0.02	0.012	0.0085	0.0085	0.014	0.0077	0.013	0.1	0.021	0.024	<0.0050	0.0093	0.013	0.012
<0.0050	<0.050	<0.050	<0.050	<0.0050	<0.0050	<0.0050	<0.0050	<0.05	<0.005	<0.050	<0.0050	<0.0050	<0.050	<0.050	<0.050
0.28	<0.20	<0.20	<0.20	0.228	0.338	0.353	0.373	0.28	0.299	0.24	0.101	0.089	<0.20	<0.20	<0.20
0.28	<0.20	<0.20	<0.20	0.228	0.338	0.353	0.373	0.28	0.299	0.24	0.101	0.089	<0.20	<0.20	<0.20
4.74	4.37	4.39	4.09	4.08	3.72	2.14	2.29	0.97	0.87	7.08	<5.0	2.28	2.51	2.46	2
4.75	4.69	4.26	3.65	4.71	4.1	2.28	2.55	1.04	1.51	9.25	<5.0	2.34	2.55	2.96	1.9
0.00081	<0.00050	0.00069	<0.00050	<0.00050	<0.00050	<0.00050	0.00069	<0.00050	<0.00050	0.00051	<0.00050	<0.00050	<0.00050	0.00076	<0.00050
0.107	0.0428	0.0329	0.0104	0.0992	0.0165	0.0224	0.00759	0.005	0.0031	0.159	0.265	0.0555	0.0284	0.0405	0.00654
0.00026	0.000254	0.000243	0.000258	0.000258	0.000247	0.00022	0.000217	0.00016	0.00014	0.000144	0.000177	0.000156	0.000151	0.000176	0.000148
0.000399	0.000272	0.000299	0.000219	0.000352	0.000209	0.000226	0.000205	0.00041	0.00029	0.000594	0.00142	0.000883	0.000657	0.000701	0.000446
0.052	0.0512	0.0502	0.0533	0.0554	0.048	0.0488	0.0544	0.0661	0.0685	0.0629	0.0714	0.0436	0.0513	0.052	0.0564
0.000015	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	<0.00001	0.000012	0.000027	<0.000010	<0.000010	<0.000010	<0.000010
<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	<0.000005	<0.0000050	0.0000061	<0.0000050	<0.0000050	<0.0000050	<0.0000050
<0.05	<0.050	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.05	<0.05	<0.050	<0.05	<0.05
0.000149	0.000109	0.000095	0.000086	0.000143	0.000118	0.00012	0.000123	0.000047	0.000038	0.0000622	0.000153	0.0000342	0.000029	0.000042	0.000029

46.4	55.7	58.8	69.5	70.6	76.8	75.2	87.3	48.3	45.3	38.8	26.7	26.2	33	33.3	37.6
0.00042	0.00012	0.0001	0.00133	0.00024	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	0.00044	0.00045	0.00012	<0.00010	<0.00010	<0.00010
0.000177	0.000086	0.000098	0.000058	0.000184	0.000059	0.000087	0.00006	0.00002	0.000016	0.000109	0.000454	0.00009	0.000057	0.000082	0.000023
0.00205	0.00141	0.00127	0.00198	0.002	0.00144	0.000974	0.000883	0.0005	0.00027	0.00131	0.00249	0.000775	0.000633	0.0008	0.000459
0.248	0.106	0.12	0.0823	0.262	0.0553	0.0748	0.026	0.014	0.01	0.224	0.609	0.115	0.0639	0.112	0.0217
0.000159	0.000079	0.000053	0.000121	0.000163	0.000056	0.00007	0.000016	0.00129	0.000023	0.000139	0.000625	0.000119	0.000049	0.000086	0.000014
0.00205	0.00234	0.00243	0.00278	0.00259	0.00256	0.00239	0.00269	0.0026	0.0024	0.0022	0.00193	0.00173	0.00215	0.00218	0.00238
16.3	20.2	21	25.1	24.6	26	28.2	31.9	13.4	13.7	12.4	7.43	7.14	8.77	9.45	10.2
0.0177	0.0111	0.0134	0.00915	0.022	0.0126	0.0155	0.0147	0.00926	0.00389	0.016	0.0559	0.0101	0.00797	0.0112	0.00713
	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	<0.00001	<0.000010			<0.000010	<0.000010	<0.000010
0.00119	0.00138	0.00146	0.00168	0.0012	0.00124	0.00122	0.00122	0.00049	0.00048	0.000386	0.000398	0.00033	0.000427	0.000463	0.00046
0.00262	0.00229	0.00222	0.00234	0.00291	0.00223	0.00208	0.00207	0.00058	0.00053	0.00124	0.00231	0.000759	0.000684	0.00101	0.000563
	0.0116	0.0088	0.0046					0.003	<0.002	0.0154			0.0036	0.0033	0.0032
0.589	0.63	0.688	0.77	0.684	0.695	0.726	0.765	0.51	0.49	0.743	0.521	0.366	0.405	0.429	0.446
0.00217	0.00221	0.00191	0.00241	0.00229	0.0022	0.0025	0.00251	0.00096	0.00096	0.000763	0.000525	0.000526	0.000532	0.000623	0.000586
3.14	3.27	2.93	3.3	3.59	3.64	3.32	3.54	2.92	2.87	2.99	2.57	2.8	2.98	2.73	2.62
0.0000101	<0.0000050	<0.0000050	<0.0000050	0.000012	<0.0000050	<0.0000050	<0.0000050	<0.000005	<0.000005	0.0000053	0.0000156	<0.0000050	<0.0000050	<0.0000050	<0.0000050
1.13	1.37	1.34	1.56	1.5	1.5	1.61	1.71	2.27	2.29	2	1.42	1.61	1.89	1.75	1.99
0.193	0.239	0.244	0.286	0.271	0.291	0.308	0.355	0.268	0.255	0.217	0.159	0.162	0.209	0.209	0.229
28	34	40	49	47	55.3	53.8	68.2	28	30	25	14	13	16	18	20
0.0000047	0.000004	0.000002	0.000004	0.000004	0.000002	0.000003	0.000003	<0.000002	<0.000002	0.0000046	0.0000069	<0.0000020	0.000002	<0.0000020	<0.0000020
<0.00020	<0.00020	<0.00020	0.00069	<0.00020	<0.00020	<0.00020	<0.00020	<0.0002	<0.0002	0.00155	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
0.00274	0.00128	0.00104	<0.00050	0.00186	<0.00050	0.0007	<0.00050	<0.0005	<0.0005	0.00469	0.00844	0.00126	0.00066	0.00139	<0.00050
0.000957	0.00113	0.00147	0.00175	0.00166	0.00208	0.00211	0.00269	0.00132	0.00132	0.00112	0.000585	0.000374	0.000487	0.000699	0.00074
0.00177	0.00116	0.00092	0.00079	0.00126	0.00074	0.00078	0.00078	<0.0002	<0.0002	0.00074	0.00129	0.00038	0.00024	0.00025	<0.00020
0.0111	0.0101	0.00749	0.0096	0.0136	0.0109	0.0116	0.0109	0.0041	0.0022	0.00609	0.0105	0.0021	0.00236	0.00376	0.00186
0.00011	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	0.00021	0.00025	<0.00010	<0.00010	<0.00010	<0.00010
0.0104	0.0111	0.00606	0.00468	0.00546	0.00293	0.00351	0.0021	0.0018	0.0014	0.0227	0.0273	0.00866	0.00956	0.0109	0.00346
0.000262	0.000246	0.000237	0.000259	0.000228	0.000277	0.000204	0.000217	0.00016	0.00014	0.000128	0.000145	0.000173	0.000162	0.000179	0.00016
0.000239	0.000227	0.000193	0.00021	0.000205	0.000223	0.000199	0.000197	0.00035	0.00025	0.000482	0.000533	0.000804	0.000618	0.000596	0.000518
0.0423	0.0485	0.0492	0.0541	0.0468	0.0526	0.0506	0.0549	0.0638	0.0636	0.0563	0.0463	0.0393	0.0495	0.0518	0.0583
<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	<0.00001	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	<0.000005	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
<0.05	<0.050	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.05	<0.05	<0.050	<0.05	<0.05
0.0000597	0.000086	0.00007	0.000084	0.000072	0.000102	0.000112	0.000109	0.000051	0.000034	0.0000375	0.0000464	0.0000215	0.000035	0.000033	0.000029
43.9	55.4	59.8	74.6	63.3	83.2	78.1	86.8	48.6	46.5	43.4	26.8	25.3	33.3	34.9	39.2
<0.00010	0.0001	0.0001	<0.00010	0.0002	0.00028	<0.00010	<0.00010	<0.0001	<0.0001	0.00013	<0.00010	<0.00010	0.00011	<0.00010	<0.00010
0.0000431	0.000044	0.000036	0.000038	0.000036	0.000043	0.000047	0.000044	0.000014	0.000014	0.00005	0.0000793	0.0000264	0.000026	0.000034	0.000024
0.00131	0.00127	0.0011	0.0012	0.00103	0.00119	0.000905	0.000825	0.00046	0.00033	0.00111	0.00126	0.000457	0.000584	0.000731	0.000543
0.0199	0.0303	0.029	0.0245	0.0177	0.0148	0.0097	0.0074	0.003	0.003	0.0497	0.0729	0.0134	0.0202	0.0304	0.0136
<0.0000050	0.000049	0.000006	<0.0000050	0.000007	0.000032	0.000018	0.000014	0.000053	0.000006	0.0000345	0.0000211	0.0000053	0.00001	0.000047	0.000018
0.00189	0.00228	0.0025	0.00294	0.00237	0.00294	0.00261	0.00259	0.0025	0.0024	0.00201	0.00168	0.00174	0.00203	0.00225	0.00255
16.6	20.5	21.6	25.7	23	30.5	29.7	32.7	13.7	13.6	12.7	7.33	6.84	8.78	9.82	10.6
0.00186	0.00706	0.00871	0.00815	0.00566	0.00998	0.0112	0.014	0.0134	0.00367	0.0112	0.00939	0.00467	0.00565	0.00775	0.00631
	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	<0.00001	<0.00001	<0.000010			<0.000010	<0.000010	<0.000010
0.00133	0.00144	0.00142	0.00151	0.00146	0.00144	0.00138	0.00118	0.0005	0.0005	0.000428	0.000379	0.000384	0.000435	0.000499	0.000481
0.00192	0.00206	0.00184	0.00216	0.00205	0.00217	0.00224	0.00211	0.00062	0.00055	0.00105	0.00132	0.000598	0.000634	0.000783	0.000641

	0.006	0.0044	0.004					0.003	<0.002	0.0096			<0.0020	<0.0020	0.0027
0.562	0.637	0.704	0.771	0.594	0.794	0.739	0.798	0.5	0.48	0.698	0.516	0.368	0.407	0.432	0.464
0.00169	0.00222	0.0022	0.00262	0.00248	0.00248	0.00262	0.00274	0.00102	0.00099	0.000824	0.000517	0.000443	0.00055	0.000659	0.000718
2.91	3.33	3.27	3.56	3.24	3.59	3.48	3.57	2.99	2.88	2.91	2.31	2.7	2.94	2.83	2.74
<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.000005	<0.000005	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
1.16	1.38	1.38	1.58	1.38	1.79	1.78	1.83	2.42	2.51	2.09	1.47	1.61	1.88	1.85	2.1
0.185	0.239	0.256	0.293	0.257	0.331	0.33	0.332	0.265	0.254	0.224	0.152	0.161	0.207	0.216	0.244
27	34	39	50	44	58.9	56	68.8	30	28	25	13	15	16	18	21
<0.0000020	0.000004	<0.0000020	0.000003	0.000002	0.000003	0.000002	<0.0000020	<0.000002	<0.000002	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020
<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.0003	<0.00020	<0.0002	<0.0002	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020
<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.0005	<0.0005	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050
0.000934	0.00114	0.00147	0.00183	0.00164	0.00251	0.00224	0.00256	0.00134	0.00137	0.00116	0.000515	0.000343	0.000468	0.000707	0.0008
0.00109	0.00097	0.00052	0.00066	0.00046	0.00072	0.00067	0.00061	<0.0002	<0.0002	0.00025	0.00024	<0.00020	<0.00020	<0.00020	<0.00020
0.00394	0.00747	0.00583	0.00783	0.00684	0.0108	0.0109	0.0107	0.006	0.0026	0.00322	0.00315	0.00159	0.00163	0.0021	0.00177
<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.0001	<0.0001	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010

				SW	SW		SW	GW		GW	GW	GW
				BC-39	BC-51W		BC-53	BC-65		BC-66	BC-67	BC-69
				Laura Creek in side channel of South Klondike R.	Pacific Pit - west side		Lower Laura Creek 50m d/s of Ditch Road	Land Application Piezometer		Land Application Piezometer	Blue WRSA Piezometer	Blue WRSA Piezometer
10/18/2012	11/27/2012	1/22/2013	2/12/2013	1/22/2013	6/20/2012	2/13/2013	6/20/2012	10/15/2012	1/22/2013	1/22/2013	7/25/2012	10/16/2012
8.38		7.95	8.3	7.73	3.48	4.25	8.12	6.38				6.98
7.79	7.86	7.93	7.92	7.9	3.5	3.35	8.15	7.23	7.66	8.05	7.76	7.89
140					587		369					492
267		205	163	97		1095		112				876
279	324	350	363	342	694	1070	383	117	111	732	473	868
0.1		0.49	0.48	0.48	16.1	1.53	4.5	1.95				2.05
14.9		7.97	6.89	8.6	7.32	4.86	17.53	12.5				5.03
102.6		59	50.7	62.4		38.6		90.5				36.5
10.6					416.6		69.3					
13.7	<1.0	5.7	1	<1.0	1.4	<1.0	67.9		182		100	
196	196	198	222	186	430	754	254		58		266	
							183.790					
138	164	168	170	169	227	379	199	57	52.7	339		518
135	174	177	169	171	210	384	185	49.1	50.1	352	241	469
82.2	94.5	99.8	99.8	97.5	<0.50	<0.50	107	50.2	45.9	247	213	348
100	115	122	122	119	<0.50	<0.50	131	61.2	56	302	259	425
<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50
<0.50	<0.50	0.91	<0.50	0.64	0.66	1.3	1	1.3	0.74	5.6	1.6	2
0.074	0.064	0.072	0.071	0.083	0.44	0.52	0.27	0.15	0.21	0.61		0.38
60.3	70.3	74	84.9	75.9	267	488	86.9	6.8	6.2	20	47.2	153
		1		0.99						0.96	0.94	
0.022	<0.0050	0.022	0.0064	0.013	<0.0050	0.14	0.01	0.023	0.032	0.011	0.023	0.017
<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0055	<0.0050	<0.0050	<0.050	<0.0050
0.112	0.215	0.296	0.272	0.242	0.243	<0.020	0.356	0.778	0.422	32.6	<0.20	0.03
0.112	0.215	0.296	0.272	0.242	0.243	<0.020	0.356	0.783	0.422	32.6	<0.20	0.03
1.68	1.71	1.59	1.28	1.19	<0.50	1.51	7.78	5.1	5.01	2.22		1.87
1.73	1.94	1.65	1.66	1.23	0.72	1.57	7.74	5.19	5.58	2.45		6.54
											<0.00050	
<0.00050	<0.00050	0.0005	<0.00050	0.00071	0.00088	<0.00050	0.00106	0.00063	<0.00050	0.00414	<0.00050	<0.00050
0.00981	0.00351	0.029	0.00434	0.00472	4.92	7.27	0.79	1.01	0.656	0.191		2.15
0.000155	0.000152	0.0002	0.000165	0.000163	0.0029	0.00143	0.0033	0.00291	0.00217	0.000314		0.0104
0.000536	0.000393	0.000461	0.000511	0.00051	0.00954	0.0114	0.00622	0.00529	0.00158	0.000508		0.145
0.0525	0.066	0.078	0.0661	0.0724	0.0429	0.0243	0.124	0.227	0.0935	0.0853		0.264
<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.0136	0.0175	0.000087	0.000096	0.000095	0.000038		0.000825
<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.000076	0.000007	<0.0000050		0.000064
<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05		<0.05
0.000033	0.000027	0.000036	0.00003	0.000028	0.00452	0.00619	0.000169	0.000487	0.000105	0.000041		0.00613

37.8	45.2	46.6	44.5	46.1	49.3	78	50.6	12.8	10.9	69.6		98.9
<0.00010	<0.00010	0.00016	<0.00010	<0.00010	0.00187	0.00235	0.00138	0.00324	0.00058	0.00233		0.01
0.000031	0.000013	0.00014	0.000024	0.000019	0.0426	0.0689	0.00184	0.00743	0.00295	0.0804		0.00653
0.00045	0.000458	0.00056	0.00042	0.000328	0.331	0.377	0.00513	0.0137	0.00473	0.00135		0.0364
0.0262	0.0087	0.067	0.0137	0.0126	3.93	6.02	1.65	1.74	0.8	0.311		9.19
0.000029	0.000054	0.000465	0.000014	0.000006	0.000162	0.000292	0.00147	0.00832	0.000857	0.00171		0.021
0.00207	0.00238	0.00217	0.00255	0.00202	0.00907	0.016	0.00902	0.00417	0.00456	0.0198		0.00955
10.5	12.3	12.6	14.2	13	25.1	44.7	17.7	6.08	6.21	40.1		65.8
0.0068	0.00363	0.00347	0.00739	0.00641	1.83	3.17	0.104	0.649	0.305	0.0169		2.14
<0.000010	<0.000010	<0.000010	<0.000010	<0.000010		<0.000010		<0.000010	<0.000010	<0.000010		0.000015
0.00041	0.000508	0.000388	0.000668	0.000594	<0.000050	0.000058	0.00155	0.000244	0.000058	0.000365		0.000471
0.000557	0.000621	0.000437	0.000752	0.00102	0.13	0.206	0.0048	0.0116	0.00475	0.0021		0.0306
0.431	0.48	0.49	0.514	0.497	1.73	2.48	1.02	1.97	1.28	2.63		7.63
0.000463	0.000721	0.000842	0.00116	0.000857	0.00587	0.00509	0.00229	0.00165	0.00169	0.0165		0.00115
2.67	3.16	3.18	2.72	3.1	7.7	11.7	5.67	6.28	5.64	4.96		6.27
<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.0000509	0.000007	0.0000122	0.000248	0.000046	0.000159		0.000912
2.06	2.19	2.17	2.41	2.27	0.827	1.1	3.07	3.15	1.68	10.2		3.91
0.227	0.264	0.268	0.276	0.262	0.318	0.618	0.224	0.0608	0.0465	0.364		0.551
19	25.3	28.6	29.1	27.6	102	161	30	<10	<3.0	8		55
<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	0.000125	0.000202	0.0000083	0.000077	0.00003	0.00002		0.000634
<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.0021	<0.00020	<0.00020		0.00127
<0.00050	<0.00050	0.00079	<0.00050	<0.00050	<0.00050	<0.00050	0.0217	0.0141	0.0055	0.00327		0.0186
0.000803	0.00112	0.00104	0.00132	0.00131	0.00506	0.00657	0.00181	0.000243	0.000186	0.000913		0.00504
<0.00020	<0.00020	0.00031	<0.00020	0.00023	<0.00020	<0.00020	0.00472	0.00291	0.00159	0.00049		0.00761
0.00267	0.00239	0.00557	0.00262	0.00176	0.365	0.551	0.0109	0.0966	0.018	0.00618		0.408
<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00044	0.00024	0.00041	0.00031		0.00124
0.00252	0.00427	0.00199	0.00193	0.00149	5.08	7.29	0.0304	0.0234	0.00814	0.00207	0.00314	0.00212
0.000146	0.000163	0.000139	0.000142	0.000166	0.00282	0.00138	0.00363	0.00175	0.00118	0.000165	0.144	0.00547
0.000464	0.000371	0.000352	0.000512	0.000611	0.00847	0.0113	0.0035	0.000615	0.000443	0.000183	0.00541	0.0398
0.0517	0.0668	0.0706	0.0673	0.0733	0.0426	0.0234	0.0613	0.0614	0.0263	0.0525	0.109	0.0251
<0.000010	<0.000010	<0.000010	<0.000010	<0.000010	0.013	0.0185	0.000017	<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
<0.0000050	0.000018	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.050	<0.05
0.000021	0.000034	0.000031	0.000031	0.000029	0.0046	0.00619	0.0000242	0.000054	0.000041	0.000027	0.000147	0.00105
37.1	48.4	49.1	44.5	46	41.6	78.2	46.7	11.1	10.3	73.4	62.2	88.9
<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00195	0.00273	0.00029	0.00021	<0.00010	0.00019	0.00069	<0.00010
0.000017	0.000017	0.00001	0.000013	0.000014	0.0427	0.0729	0.000721	0.000193	0.000153	0.0801	0.00374	0.000167
0.000363	0.000719	0.000429	0.000359	0.000595	0.325	0.384	0.00131	0.00201	0.00102	0.00041	0.000428	0.00122
0.0068	0.0052	0.0012	0.0044	0.0039	3.23	5.94	0.139	0.0392	0.0136	0.0019	0.0202	0.0048
0.000009	0.000039	0.000041	<0.0000050	<0.0000050	0.000163	0.000313	0.0000556	0.000534	0.00008	0.000034	0.000021	0.000544
0.00197	0.0026	0.00215	0.00219	0.00216	0.00927	0.0167	0.00817	0.00331	0.00396	0.0187	0.00623	0.0084
10.4	12.9	13.3	14.1	13.6	25.7	45.9	16.7	5.2	5.9	41	20.8	60
0.00564	0.00353	0.000114	0.00656	0.00571	1.91	3.5	0.0271	0.00937	0.00459	0.00109	0.466	0.212
<0.000010	<0.000010	<0.000010	<0.000010	<0.000010		<0.000010		<0.000010	<0.000010	<0.000010	<0.000010	<0.000010
0.000426	0.00051	0.000374	0.000621	0.000625	<0.000050	0.000083	0.00235	0.000105	0.000064	0.000381	0.00176	0.000304
0.000558	0.000641	0.000324	0.000613	0.000577	0.131	0.218	0.00185	0.00219	0.00115	0.00123	0.0277	0.00366

											0.0097	
0.423	0.519	0.459	0.507	0.507	1.79	2.44	1.03	1.37	1.13	2.4	1.74	6.5
0.000651	0.00065	0.000854	0.000994	0.00084	0.00507	0.00539	0.00237	0.00169	0.00205	0.0173	0.000082	0.0014
2.62	3.43	3.6	2.79	3.08	6.77	11.3	4.59	4.87	5.31	5.44	4.46	2.99
<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	0.000007	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050	<0.0000050
2.09	2.45	2.36	2.42	2.32	0.888	1.17	3.07	2.36	1.67	10.9	1.73	2.86
0.224	0.272	0.274	0.276	0.267	0.32	0.639	0.22	0.0518	0.0412	0.357	0.303	0.51
21	25.8	25.9	27.9	28.6	103	171	32	<10	<3.0	7.2	17	55
<0.0000020	<0.0000020	<0.0000020	<0.0000020	<0.0000020	0.000131	0.000213	<0.0000020	0.000006	0.000002	0.000009	0.000132	0.00028
<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	<0.00020	0.00044	<0.00020	<0.00020	0.00032	0.00039
<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	<0.00050	0.00056	0.00144	<0.00050	<0.00050	<0.00050	<0.00050
0.000785	0.00124	0.00105	0.00139	0.00135	0.00537	0.0071	0.00166	0.000024	0.000026	0.000874	0.00798	0.00403
<0.00020	<0.00020	<0.00020	<0.00020	0.00022	<0.00020	<0.00020	0.00106	0.00031	<0.00020	<0.00020	<0.00020	<0.00020
0.00163	0.00284	0.00203	0.00228	0.00183	0.369	0.566	0.00258	0.0245	0.00777	0.00361	0.119	0.132
<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	<0.00010	0.00019	0.00017	<0.00010	<0.00010	<0.00010	0.00013

Appendix D – Bioassay Results

Golden Predator Corp.
Overflow Pond-Grab

Rainbow Trout Bioassay
96-h LT50: > 96 hrs

Maxxam Analytics
4606 Canada Way
Burnaby, BC
Canada V5G 1K5
tel: 604 734-7276
fax: 604 731-2386
web: http://maxxam.ca

Sample # : EK4102-08 / B280357 / 10630 | Report # : 2-11-200-358-12-001

Sample Taken:	Sep. 6, 2012 2:00 PM	Sample pH:	8.1
Sample Collected By:	N/A	Sample Dissolved Oxygen:	10.4 mg/L
Sample Received:	Sep. 8, 2012	Sample Temperature:	14.9 °C
Start Date/Time:	Sep. 10, 2012 12:45 PM	Sample Conductance:	2147 μmho/cm

Conc. (%v/v)	Cond. (μmho/cm)	Temp. Initial (°C)	Temp. Final (°C)	pH Initial	pH Final	D.O. Initial (mg/L)	D.O. Final (mg/L)	Percent Mortality 24 hr	Percent Mortality 48 hr	Percent Mortality 72 hr	Percent Mortality 96 hr	Number of Mortalities
0	54	15.5	15.7	7.4	7.6	10.3	9.9	0	0	0	0	0
100	2135	15.0	15.7	8.1	7.6	10.3	9.9	0	0	0	0	0

Comments:
All fish appeared and behaved normally during the test. The cumulative fish culture mortality in previous 7 days was 0%. The acceptability criteria for fish culture mortality is <2%.

Test Conditions:

Organisms per Replicate:	10	Preaeration Time:	30 min.
Test Volume:	18 L	Rate of aeration:	6.5 ml/min/L
Loading Density:	0.45 g/L		

Test Organism: Rainbow Trout (*Oncorhynchus mykiss*)

Weight (Mean + SD):	0.81 ± 0.22 g	Length (Mean + SD):	4.5 ± 0.4 cm
Weight (Range):	0.45– 1.23 g	Length (Range):	3.7– 5.1 cm

Reference Toxicant: Zinc
Test was conducted on: 05/09/2012
Test gave a 96-h LC50 of 0.2 (0.08, 0.32) mg/L
The historical mean LC50 and warning limits were 0.15 (0.06, 0.37) mg/L.

Dilution Water: Vancouver Tapwater hardened and dechlorinated
EDTA Hardness: 28 mg $CaCO_3$/L Other parameters available on request

Test Method: Biological Test Method: Reference Method for Determining Acute Lethality of Effluent to Rainbow Trout, EPS 1/RM/13, Second Edition, December 2000 and May 2007 Amendments. Results contained in this report refer only to the testing of samples as submitted.

Analyst	Verified By
W Brassil 2012 Sep 17	J. Pickard SEP 17 2012

Appendix E – Laberge Environmental Services: Sediment, Benthic, Fisheries, and Benthic Monitoring Report and On-Site Wildlife Logs

BASELINE ENVIRONMENTAL ASSESSMENTS

FOR THE

BREWERY CREEK PROPERTY, 2012

For

PREDATOR GROUP

Submitted by

Laberge ENVIRONMENTAL SERVICES

November 15th, 2012

Laberge Environmental Services
P.O. Box 21072
Whitehorse, Y.T.
Y1A 6P7
Office Phone: 867-668-6838
Home Phone: 867-668-1043
email: Laberge@northwestel.net

EXECUTIVE SUMMARY

The executive summary will be completed in the final report once all data has been received, compiled and interpreted.

TABLE OF CONTENTS

APPENDICES

LIST OF TABLES

LIST OF FIGURES

1.0 INTRODUCTION

The claims comprising the Brewery Creek Project were initially staked in 1987 by Noranda Exploration Limited. Initial environmental baseline studies, similar to the ones conducted in this report, were completed by Norecol Dames and Moore (Norecol) in 1991 for Loki Gold Corporation (Steffen Robertson and Kirsten Inc, 1994).

The property is a past heap leach operation which operated from 1996 through 2002; Loki Gold Corporation from 1993 to 1996, Viceroy Minerals Resources from 1996 to 2002. During that time the mine produced approximately 280,000 oz of gold from seven near surface oxide deposits, shutting down in 2002 due to low gold prices.

On March 15th, 2005, Alexco Resource Corporation (Alexco) acquired mine assets and completed all reclamation work by the end of 2007. In 2012 Golden Predator signed a purchase agreement with Alexco to acquire a 100% interest in the project, which will replace their existing Brewery Creek Option Agreement once closed.

The Brewery Creek property operates under an existing Type A Water License and a Quartz Mining License, both with an expiration date in 2021.

In 2011, Golden Predator, through their extensive drilling program discovered three new deposits, Classic, Sleemans and Schooner. In the spring of 2012, Golden Predator contracted Laberge Environmental Services of Whitehorse, Yukon, to conduct environmental baseline surveys of these areas as well as update information for the entire property.

This report covers the wildlife, vegetation, benthic invertebrate and fisheries components of an environmental baseline study.

2.0 STUDY AREA

The study area lies within and surrounding Golden Predator's Brewery Creek claim block and is located approximately 55 kilometres east of Dawson City, Yukon (Figure 1).

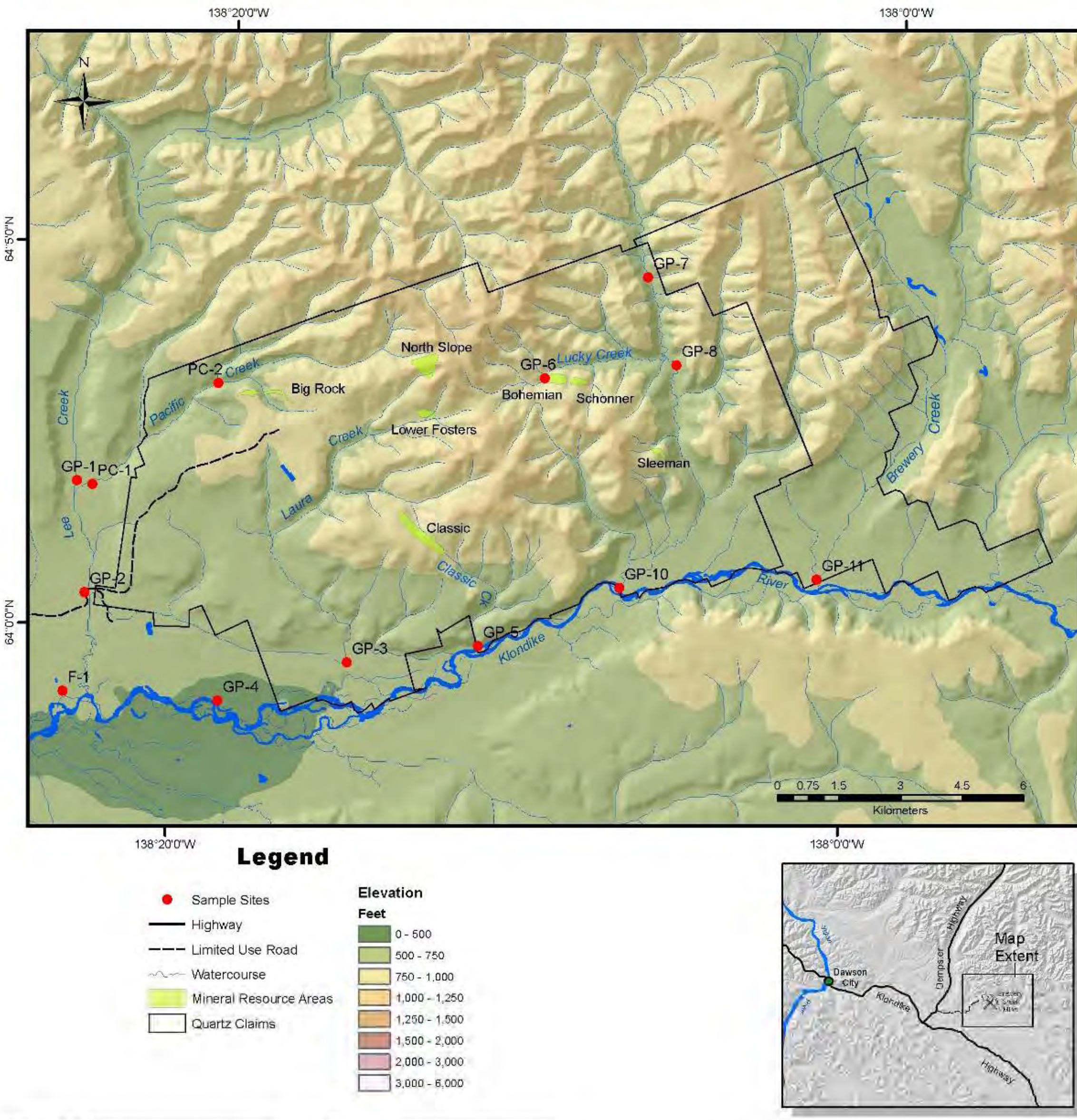
This district falls within the ecoregion Yukon Plateau-North northeast of the Tintina Trench and hosts considerable potential for metallic mineral deposits. The glaciated valleys contain numerous wetlands. The study area is within the northern boreal forest with talus slopes at the higher elevations (Yukon Ecoregions Working Group, 2006).

Sample sites were established on Lee, Pacific, Laura, Golden and Brewery Creeks (Figure 1) and are described in Table 2-1. Most sites were accessed by helicopter.

TABLE 2-1 SITE DESCRIPTIONS AND LOCATIONS

BASELINE SITE #	LICENSED SITE #	SITE DESCRIPTION	COORDINATES (NAD 83)
GP-1	BC-33 (B6)	Lee Creek upstream of Pacific Creek	N 64°1.9214' W 138°23.4448'
PC-1	BC-05	Pacific Creek upstream of Lee Creek	N 64°1.8891' W 138°23.1072'
PC-2	BC-35	South trib of Pacific Creek below Big Rock ore bodies	N 64° 3.357' W 138° 19.633'
GP-2	BC-34 (B1)	Lee Creek at Yukon Ditch Road	N 64° 0.469' W 138° 23.051'
F-1		Lee Creek at mouth	N 63° 59.153' W 138° 23.425'
GP-3	BC-01 (B3)	Laura Creek	N 63° 59.867' W 138° 15.042'
GP-4	BC-39 (B9)	Laura Creek near mouth u/s of the South Klondike River	N 63° 59.215' W 138° 18.782'
GP-5	BC70	Classic Creek at mouth	N 64°0.232' W 138°11.175'
GP-6	BC-04 (B7)	Lucky Creek	N 64°3.808' W 138°9.892'
GP-7	BC-36	Golden Cr u/s Lucky Cr	N 64° 5.247' W 138° 7.074'
GP-8		Golden Cr d/s Lucky Cr	N 64° 4.129' W 138° 5.988'
GP-9	BC-31 (B2)	Golden Creek	N 64°01'51" W 138°04'57"
GP-10		Golden Cr at mouth	N 64° 1.156' W 138° 7.114'
GP-11		Brewery Cr at mouth	N 64° 1.493' W 138° 1.253'

The licensed sites (column two) with a BC prefix indicate it is a water quality site. The site names in brackets are the licensed benthic inverterbrate sample sites.



Site #	Type of Sampling
GP-1	Fisheries, benthic inverebrates, stream sediments, water quality.
PC-1	Fisheries
PC-2	Fisheries
GP-2	Fisheries, benthic inverebrates, stream sediments, water quality.
F-1	Fisheries
GP-3	Fisheries, benthic inverebrates, stream sediments, water quality.
GP-4	Not sampled. Dry due to beaver dam much father upstream.
GP-5	Benthic inverebrates, stream sediments, water quality
GP-6	Fisheries, benthic inverebrates, stream sediments, water quality.
GP-7	Water quality.
GP-8	Benthic inverebrates, stream sediments, water quality.
GP-10	Fisheries, benthic inverebrates, stream sediments, water quality.
GP-11	Fisheries, benthic inverebrates, stream sediments, water quality.

BREWERY CREEK PROJECT

Figure 1

SAMPLE SITE LOCATIONS

Laberge ENVIRONMENTAL SERVICES   PREDATOR GROUP

Drawing prepared by K. Pelletier,
Ibex Consulting, October 2012
Baseline data: http://geogratis.cgdi.gc.cageogratis

3.0 WILDLIFE

3.1 BACKGROUND INFORMATION

A literature search revealed two previous wildlife studies that had been conducted in and near the study area; in 1993 and in 2009.

In 1993, Norecol conducted aerial wildlife surveys in March and October as a component of the Initial Environmental Evaluation prepared for Loki Gold Corporation (Steffen Roberston and Kirsten, 1994).

In March 2009, Dawson Land Use Planning conducted a fixed wing aerial survey for moose covering the Klondike River drainage, the North Klondike Highway as far south as Gravel Lake and north to the Tombstone Territorial Park (Dawson Land Use Planning Summary Report, 2009). Our study area constituted a small portion of the region surveyed by DLU.

In addition, information was gathered from interviews with Yukon Government personnel; the Harvest Management Specialist, Regional biologists and field technicians, the Fur Harvest Technician and Wildland Fire Management.

The camp’s wildlife logs were also reviewed to get an idea of incidental animal observations.

Mortalities have been documented at the site on only two occasions; both were drownings in the process ponds. In 2003 a fox was discovered in the Stage 2 Pond of the effluent treatment system. Two young moose calves were found in the overflow pond in May 2006. The fence around the process ponds had been removed earlier as a condition of the approved reclamation and closure plan. A new fence was erected in June 2006 to prevent future wildlife incidents and remained in place until the pond liners were removed in 2008.

3.2 METHODS

Aerial wildlife surveys were conducted on three occasions in 2012 (March, June and October) with a primary focus on moose. Grant Lortie was the lead wildlife biologist for each trip. The purpose of the surveys was to demonstrate seasonal range use and timing of these events, with some insight into seasonal social behavior and influencing envir onmental factors proximal to exploration and mining activities.

All surveys were conducted from a Trans North B206 jet ranger helicopter flying at a speed of approximately 120 km/hour at around 120 m above ground surface. The wildlife biologist/navigator sat in the front seat with two observers providing assistance in both directions from the rear seat.

Track logs and waypoints (observations) of each survey were downloaded from a hand held GPS onto maps and are provided in Appendix A.

Following each survey, a technical memo detailing the findings was submitted to Predator Mining Group. The results from each survey are summarized in the following section.

3.3 RESULTS AND DISCUSSION

During the three surveys conducted in 2012, moose were clearly the most conspicuous and abundant large mammal observed.

When comparing the results of the 1993 survey prior to the development of Loki Gold's mine at Brewery Creek, and the 2012 survey, there appears to be little change in moose numbers and distribution. If anything, populations may have increased.

Wolves and bears were the primary furbearers observed albeit in low numbers. No caribou or sheep were documented in or near the study area during any of the surveys.

The Brewery Creek claim block lies outside of the known ranges of the three caribou herds (Hart River, Porcupine and 40 Mile) but the possibility of caribou visiting the property does exist. Long time Dawson residents have mentioned seeing caribou close to the Klondike Highway in the past. During a fall caribou survey in 2005, the Dawson office of Yukon Environment observed caribou on the lower part of the Dempster Highway (Kienzler, 2005). By tracking collared animals it was determined that both the Hart River and Porcupine Caribou herds were represented. The southern range of the Porcupine Herd is considered to be around Km 68 on the Dempster Highway however in mid October, 2005, animals had ranged as far south as Km 13. Deep caribou trails were observed paralleling the Dempster Highway and the North Klondike River between the Dempster Corner and the Tombstone Campground. As there was some local suspicion that some of the caribou seen on the lower Dempster may have been from the 40 Mile herd, considerable time was spent listening for collared animals from this herd but none were found. Three collared Hart River caribou were found on ridges directly about the Brewery Creek mine site, an area where they had not previously been documented. Following the telemetry survey there were reports of as many as 500 to 1000 caribou on the reclaimed areas just above the mine.

Caribou were documented on site on one occasion. During a weekly water sampling program on November 1st, 2005, Viceroy personnel discovered 53 caribou trapped on the frozen tailings ponds (M. Kienzler, email correspondence). The ponds had previously been fenced to keep out wildlife, but fencing was removed during decommissioning. The ponds were lined and the caribou could not ascend the slippery slopes to escape. It is not known how many days they may have been there but due the amount of sign, it appeared to have been quite some time. After chain-link fence was laid down on the slopes and covered with hay, all caribou eventually managed to get out (see Photos #1 and #2 in Appendix A). Due to the amount of sign on the recently reclaimed slopes of the leach pad, the caribou may have been attracted to the planted cover of vegetation.

Details of the 2012 and 1993 surveys are presented below.

3.3.1 Late Winter Survey

The late winter survey was conducted on March 13th, 2012 to determine the winter range of moose and to identify the use of the study area by other species. The Trans North B206 helicopter was piloted by Doug Hladin, with Bonnie Burns (Laberge Environmental Services) and Ryan Peterson (Tr'ondëk Hwëch'in First Nation) providing observational support for Grant Lortie. The complete claim block was surveyed including a surrounding buffer zone of up to five kilometers. An additional 30 kilometeres was flown north along Brewery Creek in attempts to locate caribou in the uplands (Map 1, Appendix A). Total survey time was three hours and 26 minutes.

The survey documented 61 sightings of moose and considerable sign (Tables 3-1 and 3-2, Appendix A). Moose were widely dispersed thr oughout the study area primarily along stream courses below timberline. As males are antler-less at this time of year, no attempt was made to differentiate the sex of the moose observed.

A total of 36 moose were observed during the late winter survey conducted by Norecol on March 26, 1993, over 3.2 hours of survey time. The Dawson Land Use Planning survey covered an area of 10,600 square kilometres and recorded 553 moose. It is difficult to extrapolate how many of these were actually within our study area, however, suffice to say, moose are in important ungulate in the Brewery Creek vicinity.

No caribou or sheep were observed within the current study area during any of the aforementioned surveys.

Five wolves were observed during the March 2012 survey, one at a moose kill site on Brewery Creek at Waypoint #26 (Table 3-3, Map 1, Photo #_, in Appendix A).

Lynx tracks, the only sign of other species, were observed at Waypoint #52 (Map 1, in Appendix A).

3.3.2 Early Summer Survey

A late spring / early summer survey was completed on June 5th, 2012 to document the abundance and distribution of moose and calves near and throughout the study area. The Trans North B206 helicopter was piloted by Kevin Duff, with Bonnie Burns and Marissa Hackman (Laberge Environmental Services) providing observational support for Grant Lortie. The complete claim block was surveyed over the course of three hours and four minutes. (Map 2, Appendix A).

Ground conditions were less than favorable as most deciduous shrubs and trees had leafed out. More importantly the main stem of the South Klondike River and the lower tributaries were in flood stage, inundating much of the preferred riparian calving habitat.

A total of seven moose were observed, 3 males and 4 females (Tables 3-4 and 3-5, Appendix A). No calves were seen. Incidental observations included a beaver, a black bear, a red-tailed hawk and two trumpeter swans (Table 3-6, Appendix A).

An examination of the camp wildlife log from May 6 to June 5, 2012 (Table3- 7, Appendix A) reveals that 13 bears and 11 moose were observed. The majority of the sightings were on access routes to and through the property. (Fox are typically observed at the camp.) This concurrence can be expected as bears of both species actively hunt neonate moose calves, a specialty with some individual bears. Suboptimal calving conditions and the observed presence of important neonate predators are likely contributing factors to the poor survey results.

3.3.3 Late Autumn Survey

The late autumn / early winter survey was conducted on October 30th, 2012, to determine the post-rut aggregations of moose. Ground cover of snow allowed easy viewing of animals. Moose have not lost their antlers at this time of year so males could be identified during the survey.

Maps and tables were not available by submission date of this draft report.

Norecol conducted a similar survey on October 28th, 1993. A total of five moose were observed: two adult bulls above treeline east of Lee Creek; one cow in the flood plain of the Klondike River east of Lee Creek; and one cow/calf pair in the flood plain of the confluence of Lee Creek and the Klondike River. Other incidental sightings were wolf tracks along the Klondike River, marten tracks in the Lee and Brewery Creek drainages and six ptarmigan in the subalpine zone.

3.3.4 Outfitter Concessions

The study area lies wholly within Concession #3, operated by Hunt Yukon Outfitting Ltd. Game Management Areas (GMA) 229, 250 and 251 cover the Dempster Highway corridor, mine access and mine properties. A modest level of both resident and non-resident harvest of the principal big game species from 2002 to 2011 is presented in Table3- 8 in Appendix A. In the table Non-Res means non resident hunters who would have been guided by an outfitter, and Res refers to resident licensed hunters but does not include first nation hunters.

3.3.5 Trapline Concessions

Concession #23, overlying most of the study area is operated by the Fraser Family. Adjacent on the east and for the most part with Brewery Creek as the common boundary, lies Concession #65 operated by Greg Brunner and Cynthia Hunt. Concession #63 includes Lower Brewery Creek and the entire Aussie Creek drainage. Fur harvest information remains privileged.

4.0 VEGETATION ASSESSMENTS

4.1 BACKGROUND INFORMATION

With the planned reopening of the Brewery Creek gold mine, an update of environmental baseline conditions at the site is now required, including an inventory of the currently occurring vegetation.

Former efforts at characterizing the vegetation in the area include a regional level vegetation description for the Klondike Valley Plan by Kennedy and Staniforth (1991), a 1:40,000 scale vegetation map of the Brewery Creek Mine area by Steffen Robertson Kirsten (1994), and a localized description of the vegetation at the Bohemian and Big Rock ore zones by Access Mining Consulting Limited (1999).

The 2012 report focuses on the vegetation occurring at seven targeted ore zones. These include the Lower Fosters, Classic, North Face, Bohemian, Schooner, Sleemans and Big Rock zones.

4.2 METHODS

4.2.1 Survey Preparations

Existing information on the vegetation at the Brewery Creek Mine was acquired and reviewed, including the reports and maps referred to above.

2009 satellite imagery (1:20,000 scale) and a 2011 orthophoto (1;20,000 scale) were provided by Golden Predator Corp. From these images, preliminary field maps were prepared by Ibex Valley Environmental Consulting Inc. Probable vegetation zones at each of the targeted ore zones were then delineated by air photo interpretation prior to the field survey. A fire history map of the area was acquired from Wildland Fire Management, Government of Yukon.

A listing and description of vascular plant species currently considered to be rare in the Yukon were acquired from the Yukon Conservation Data Centre, Government of Yukon. These were reviewed, resulting in a short list of rare plant species most likely to occur in the Brewery Creek Mine area.

4.2.2 Field Surveys

Field surveys were carried out July 9th to 13th, 2012. Surveys consisted of randomly chosen walking transects through the vegetation zones encountered on and around each of the seven targeted ore zones. A list of the vascular plant species observed was compiled for each vegetation zone. If plant species were not readily identifiable, specimens were collected. The dominant species in each layer (upper story, tall shrub layer and ground cover) were noted. Photographs were taken.

The plant specimens collected were identified if possible in the field camp. If not identifiable in the field, specimens were preserved for later identification.

The identification and cataloguing of nonvascular plant species (lichens, mosses and liverworts), although not planned for this field survey, were also recorded.

4.3 RESULTS AND DISCUSSION

4.3.1 Vegetation Communities in Study Area

4.3.1.1 Black Spruce Vegetation Community

The black spruce vegetation community is prevalent on north-facing slopes throughout the Brewery Creek Mine area. *Picea mariana* dominates the upper storey with *Betula neoalaskana* being more prominent in open areas. *Alnus crispa* is the only tall shrub occurrence . *Ledum decumbens*, *Vaccinium vitus-idaea*, *Empetrum nigrum*, along with mosses (particularly *Pleurozium schreberi*) and lichens dominate the ground cover.

4.3.1.2 Black Spruce / Birch Vegetation Community

The black spruce/birch vegetation community is found on the more gently south-facing slopes throughout the Brewery Creek Mine area. *Picea mariana* and *Betula neoalaskana* are the most common tree species. *Picea glauca Populus balsamifera*, and *Populus tremuloides* also occur. *Salix scouleriana* is the only common tall shrub. The ground cover is predominately *Vaccinium vitus-idaea*, *Empetrum nigrum*, *Geocaulon lividum*, *Cornus canadensis*, along with mosses, primarily *Pleurozium schreberi*.

4.3.1.3 Black Spruce / Aspen Vegetation Community

The black spruce/aspen vegetation community occurs on well drained upland slopes and near-level areas. *Populus tremuloides* forms the upper storey in this vegetation type. The sub-canopy consists of a dense layer of *Picea mariana*. The ground cover is primarily *Vaccinium vitus-idaea* and *Empetrum nigrum* with m osses (mostly *Pleurozium schreberi*) and lichens (*Peltigera apthosa* and *Stereocaulon* sp.).

4.3.1.4 White Spruce Vegetation Community

The white spruce vegetation community in the Brewery Creek Mine area is restricted to well drained southerly-facing slopes. The upper storey consists of an open canopy of *Picea glauca* and *Populus tremuloides*. Small open canopy stands of *Populus tremuloides* occur on the steeper slopes. *Salix souleriana* and *Salix bebbiana* are the dominant tall shrubs. The ground cover consists m ostly of *Arctostaphylos uva-ursi*, *Vaccinium vitis-idaea* and *Juniperus communis* along with the grasses *Calamagrostis purpurascens* and *Festuca altaica*. Lichens and mosses are uncommon.

4.3.1.5 Dwarf Birch Vegetation Community

In the Brewery Creek Mine area, the dwarf birch vegetation community occurs in sub-alpine areas. Small stands of *Abies lasiocarpa* and *Picea glauca* are found throughout this vegetation type. The dominant shrub is *Betula glandulosa*. Herbaceous species are uncommon. Lichens and mosses (primarily *Pleurozium schreberi*) form the ground cover.

4.3.1.6 Willow Vegetation Community

The willow vegetation community is restricted to narrow valley bottoms in the Brewery Creek Mine area. This tall shrub community is dominated by *Salix* spp. along with the occasional *Alnus incana*. Trees are uncommon, although *Picea glauca* and *Populus balsamifera* do occur. The ground cover consists of forbs such as *Petasites sagitattus* and *Parnassia* spp. and grasses such as *Calamagrostis canadensis* and *Arctagrostis latifolia*, along with lichens and mosses.

4.3.2 Vegetation Zonation in the Target Ore Zones

The approximate delineation of vegetation communities in each of the seven targeted ore zones are shown on the six maps in Appendix B. A list of all species observed in each ore zone and photographs are also presented in Appendix B.

4.3.2.1 Lower Fosters

The upslope portion of the Lower Fosters ore zone has been previously cleared. Part of the cleared area was recontoured and seeded during the earlier reclamation program. The ground cover here includes seeded species such as *Festuca rubra and Trifolium hybridum* along with naturally colonizing species such as *Crepis tectorum*, *Taraxacum officinale* and *Agrostis scabra*. Farther to the east, the previoulsy cleared but un-mined ground has naturally regenerated with 6 m tall *Populus tremuloides* and *Populus balsamifera* along with *Salix scouleriana*, *Betula neoalaskana* and *Alnus crispa*. Lower shrubs include *Ribes hudsonianum, Rubus idaeus* and *Picea glauca*.

The upper part of the uncleared slope in this ore zone is the white spruce vegetation community, dominated by an upper story of *Picea glauca* (up to 80 cm dbh). The shrub layer is *Ribes lacustre, Spiraea beauverdiana*. The ground cover is dominantly *Vaccinium vitus-idaea*, *Cornus canadensis* and *Pleurozium shreberi*.

The lower part of the uncleared slope in this ore zone is the black spruce/birch vegetation community, dominated by an upper story of of *Picea mariana* and *Betula neoalaskana.* The shrub layer is primarily *Alnus incana* and *Alnus crispa*. The ground cover is dominantly *Vaccinium vitus-idaea*, *Empetrum nigrum* and *Pleurozium shreberi*.

The Laura Creek valley bottom is the willow vegetation community, consisting of a dense layer of *Salix* spp. (mostly *Salix pulchra*) and *Alnus incana*. The ground cover is *Arctagrostis latifolia* and *Calamagrostis canadensis*, along with several forb species.

4.3.2.2 Classic

The upper near-level area of the Classic ore zone is black spruce/aspen community. Most of this was area burned in the 2004 forest fire. The upper story consists of standing dead *Picea mariana* with a few unburned *Populus tremuloides* and *Betula neoalaskana*. The shrub layer is a regeneration of *Populus tremuloides, Betula neoalaskana* and *Salix scouleriana.* The divers ground cover consists of colonizing low shrubs such as *Ledum groenlandicum*, *Vaccinium vitus-idaea* and *Linnae borealis*, and forbs including *Epilobium angustifolium*, *Lupinus arcticus* and *Polemonium acutiflorum.*

Unburned areas at the southern limits of the ore zone are gently sloping, south-facing white spruce forest. These unburned areas have a canopy of *Picea glauca* and *Populus tremuloides* and a tall shrub layer of *Salix scouleriana* . Forbs such as *Senecio lugens*, *Zygadenus elegans* and *Lupinus arcticus*, along with the grass *Festuca altaica*, make up the ground cover.

Patches of unburned black spruce forest remain along the north-facing areas of the ore zone. These areas have a canopy of *Picea mariana* and a shrub layer of *Salix glauca* and *Betulosa glandulosa*. The ground cover is made up of low shrubs such as *Empetrum nigrum*, *Rubus chamaemorus* and *Vaccinium vitis-idaea*, along with mosses and lichens. Forbs and grasses are uncommon.

4.3.2.3 North Slope

Two distinct vegetation communities cover the North Slope ore zone. The north-facing slope is typical black spruce forest with sparse *Picea mariana* and a few tall *Betula neoalaskana* as the upper story and dense *Betula glandulosa* as the shrub layer. *Ledum* spp., *Empetrum nigrum* and *Vaccinium uliginosum*, along with mosses and lichens, dominate the ground cover.

The south-facing slope is white spruce forest with *Picea glauca* and *Populus tremuloides* making up the tree canopy and *Salix scouleriana*, *Salix bebbiana* and *Shepherdia canadensis* dominating the shrub layer. The ground cover is a diversity of forbs and grasses including *Linnaea borealis*, *Cornus canadensis*, *Lycopodium complanatum* and *Festuca altaica*.

4.3.2.4 Bohemian

The vegetation at the Bohemian ore zone is mostly of the north-facing black spruce community, with *Picea mariana* and the occasional *Betula neoalaskana* as the upper story. *Alnus crispa* forms the shrub layer and mosses (primarily *Pleurozium schreberi*) form the ground cover. Much of the original vegetation on this slope has been removed during earlier mineral exploration work.

The dwarf birch vegetation community covers the subalpine area of this ore zone. Scattered stands of *Picea glauca* occur while *Betula glandulosa* is the dominant shrub. Lichens and mosses form the ground cover. Most of this part of the Bohemian ore zone was burned during the 2004 fire.

The Lucky Creek valley bottom is the willow vegetation community, consisting of a dense layer of *Salix* spp. (mostly *Salix pulchra*) and *Alnus incana*. The ground cover is *Arctagrostis latifolia* and *Calamagrostis canadensis*, along with several forb species.

The steeper part of the south-facing slope north of Lucky Creek is white spruce forest with an open canopy of *Picea glauca* and *Populus tremuloides*. *Shepherdia canadensis* and *Rosa acicularis* dominate the shrub layer. The ground cover is a diversity of forbs and grasses including *Linnaea borealis*, *Cornus canadensis*, *Lupinus arcticus* and *Festuca altaica*.

The less steep part of the south-facing slope north of Lucky Creek is the black spruce/birch vegetation community, dominated by an upper story of *Picea mariana* and *Betula neoalaskana.* Tall shrubs are uncommon. The ground cover is dominantly *Vaccinium vitus-idaea*, *Geocaulon lividum* and *Pleurozium shreberi*.

4.3.2.5 Schooner

Two distinct vegetation communities occur in the Schooner ore zone. The north-facing slope is black spruce forest with *Picea mariana* forming the upper story and *Betula glandulosa* dominating the shrub layer. *Ledum* spp., *Rubus chamaemorus* and *Vaccinium uliginosum*, along with mosses and lichens, dominate the ground cover.

The south-facing slope is white spruce forest with *Picea glauca* and *Populus tremuloides* making up the tree canopy on the upper slope, with more *Picea mariana* and *Betula neoalaskana* occurring lower down the slope. The shrub layer is a dominated by *Ribes hudsonianum*, *Ledum* sp., and *Rosa acicularis*. The ground cover is a diversity of forbs and grasses including *Linnaea borealis*, *Cornus canadensis*, *Lycopodium clavatum* and *Arctagrostis latifolia*.

4.3.2.6 Sleemans

The upper portion of the north-facing slope at the Sleemans ore zone was burned in the 2004 forest fire. Regeneration includes a shrub layer of *Betula glandulosa* along with *Betula neoalaskana*, *Salix scouleriana* and *Picea mariana*. The ground cover is mostly forb species including *Polygonum alaskanum* and *Epilobium angustifolium*. Ferns growing on a steep scree incline just inside the burned area include *Dryopteris fragrans*, *Gymnocarpium jessoense* and *Woodsia alpina*.

The lower part of this slope was not burned in the 2004 fire. This typical black spruce forest has a sparse canopy of *Picea mariana* and a shrub layer of *Salix barratiana*, *Ribes triste, Ledum decumbens* and *Spiraea beauverdiana.* The ground cover is dominated by *Empetrum nigrum*, *Rubus chamaemorous* and *Arctagrostis latifolia*, along with mosses and lichens.

The southeast-facing slope was entirely burned in the 2004 fire, except for the occasional pocket of trees that were missed by the blaze. *Salix bebbiana*, *Salix scouleriana* and *Populus tremuloides* are the most prevalent shrubs in the regenerating forest. *Picea glauca* and *Betula neoalaskana* also occur. The ground cover consists of a wide diversity of regenerating dwarf shrubs, forbs and grasses, including *Polygonum alaskanum*, *Equisetum sylvaticum*, *Gentianella propinqua*, *Conioselinum cnidiifolium*, *Arctagrostis latifolia* and *Festuca altaica*.

4.3.2.7 Big Rock

The north-facing slopes in Big Rock ore zone are covered by typical black spruce forest with sparse *Picea mariana* and a few tall *Betula neoalaskana* as the upper story, and *Betula glandulosa* as the shrub layer. *Ledum* spp., *Empetrum nigrum* and *Vaccinium uliginosum*, along with mosses and lichens, dominate the ground cover.

The south-facing slope on the north side of Pacific Creek is white spruce forest with *Picea glauca* and *Populus tremuloides* making up the tree canopy and *Salix scouleriana*, *Shepherdia canadensis* and *Rosa acicularis* dominating the shrub layer. The ground cover is a diversity of forbs and grasses including *Linnaea borealis*, *Calamagrostis purpurascens*, *Lycopodium complanatum* and *Festuca altaica*.

Much of the upland area in this ore zone is the black spruce/birch vegetation community, dominated by an upper story of of *Picea mariana* and *Betula neoalaskana.* Tall shrubs are uncommon. The ground cover is dominantly *Vaccinium vitus-idaea*, *Geocaulon lividum* and *Pleurozium shreberi*.

The vegetation on the near-level well drained upland areas is the black spruce/aspen community, with *Populus tremuloides* forming the upper story and a dense layer of *Picea mariana* forming the sub-canopy. Tall shrubs are uncommon. The ground cover is *Vaccinium vitus-idaea* and *Empetrum nigrum* along with mosses and lichens.
The Pacific Creek valley bottom is the willow vegetation community, consisting of a dense layer of *Salix* spp. (mostly *Salix pulchra*) and *Alnus incana*. The ground cover is *Arctagrostis latifolia* and *Calamagrostis canadensis*, along with several forb species.

The north-facing slopes in Big Rock ore zone are covered by typical black spruce forest with sparse *Picea mariana* and a few tall *Betula neoalaskana* as the upper story and *Betula glandulosa* as the shrub layer. *Ledum* spp., *Empetrum nigrum* and *Vaccinium uliginosum*, along with mosses and lichens, dominate the ground cover.

The south-facing slope on the north side of Pacific Creek is white spruce forest with *Picea glauca* and *Populus tremuloides* making up the tree canopy and *Salix scouleriana*, *Shepherdia canadensis* and *Rosa acicularis* dominating the shrub layer. The ground cover is a diversity of forbs and grasses including *Linnaea borealis*, *Calamagrostis purpurascens*, *Lycopodium complanatum* and *Festuca altaica*.

Much of the upland area in this ore zone is the black spruce/birch vegetation community, dominated by an upper story of of *Picea mariana* and *Betula neoalaskana.* Tall shrubs are uncommon. The ground cover is dominantly *Vaccinium vitus-idaea*, *Geocaulon lividum* and *Pleurozium shreberi*.

The vegetation on the near-level well drained upland areas is the black spruce/aspen community, with *Populus tremuloides* forming the upper story and a dense layer of *Picea mariana* forming the sub-canopy. Tall shrubs are uncommon. The ground cover is *Vaccinium vitus-idaea* and *Empetrum nigrum* along with mosses and lichens.

The Pacific Creek valley bottom is the willow vegetation community, consisting of a dense layer of *Salix* spp. (mostly *Salix pulchra*) and *Alnus incana*. The ground cover is *Arctagrostis latifolia* and *Calamagrostis canadensis*, along with several forb species.

4.4 Rare Plants

The Yukon Conservation Data Centre, Government of Yukon, maintains a listing of vascular plant species currently considered to be rare in the Yukon. This was reviewed, resulting in a short list of rare plant species most likely to occur in the Brewery Creek Mine area. They include:

Botrychium alaskense	Alaska Moonwort
Botrychium mulitfidum	Leathery Grape Fern
Polystichum lonchitis	Northern Hollyfern
Asplenium trichomanes-ramosum	Green Spleenwort
Agrostis clavata	Clubbed Bentgrass
Trisetum sibiricum	Siberian Trisetum
Cypripedium guttatum var. *guttatum*	Spotted Lady's-slipper
Cypripedium parviflorum	Small Yellow Lady's-slipper
Claytonia scammaniana	Scamman's Springbeauty
Minuartia yukonensis	Yukon Stitchwort
Silene uralensis ssp. *ogilviensis*	Ogilvie Mountains Nodding Campion
Silene williamsii	Williams' Campion
Draba stenopetola	Star-flowered Draba
Erysimum angustum	Dawson Wallflower
Oxytropis mertensia	Merten's Locoweed
Podistera yukonensis	Yukon Woodroot
Primula eximia	Arctic Primrose
Phacelia mollis	MacBride's Phacelia
Senecio sheldonensis	Mount Sheldon Groundsel
Taraxacum carneocoloratum	Pink Dandelion

No plant species currently considered to be rare were observed within the survey areas in and around the seven targeted ore zones.

4.5 Fire History

Much of the area within the Brewery Creek Mine claim block has been burned by forest fires in recent years (see map in Appendix B). The most significant recent fires in the area occurred in 1989, 2004 and 2010.

The 1989 fire burned a large area to the east of Golden Creek. The most westerly edge of the fire reached the southern limits of the Sleemans ore zone.

The 2004 fire covered the largest area within the Brewery Creek Mine claim block, including most of the area between Laura Creek and the South Klondike River. It burned most of the forest cover on the Classic ore zone and the southern subalpine area of the Bohemian ore zone. Most of the southeast-facing slope and part of the north-facing slope of the Sleemans ore zone were also burned in this fire.

The 2010 fire burned only small areas in the northeast corner of the Brewery Creek Mine claim block and did not reach any of the targeted ore zones.

The Big Rock, Lower Fosters, North Slope and Schooner ore zones were not affected by either of these fires.

4.6 Revegetation

The disturbed areas of the Brewery Creek mine site were revegetated by Viceroy and Alexco during mining and decommissioning. As a component of the current Water License the revegetated areas were assessed annually by Laberge Environmental Services from 2005 to 2009. Details on these assessments can be found in the annual reports submitted to the Yukon Territory Water Board. Assessments are to be conducted every five years following 2009 until the expiry of the license.

The vegetation on each of the seven targeted ore zones has had significant levels of disturbance, in some cases dating back to the 1980s. Much of the current vegetation on these ore zones consists of naturally occurring revegetation on access roads, drill pads, etc. Willows, alder, poplar and aspen are the most prolific pioneering shrub species. Plant species observed colonizing disturbed sites include:

Shrubs
Alnus crispa
Alnus incana
Picea glauca
Picea mariana
Populus balsamifera
Populus tremuloides
Ribes glandulosum
Rosa acicularis
Rubus idaea
Salix alaxensis
Salix bebbiana

Forbs
Corydalis sempervirens
Crepis tectorum
Epilobium angustifolium
Erigeron acris
Lupinus arcticus
Polygonum alaskanum
Taraxacum officinale

Trifolium hybridum

Grasses
Agrostis scabra
Calamagrostis canadensis
Festuca rubra
Hordeum jubatum

The only area in the seven targeted ore zones that has previously been reclaimed is the upper slope of the Lower Fosters ore zone. This area was recontoured and seeded during the earlier revegetation program.

5.0 SURFACE WATER QUALITY

5.1 METHODS

Surface water quality was not a component of this baseline survey but samples were collected at the benthic invertebrate sites in August 2012 to help characterize habitat conditions. Extensive surface water quality monitoring programs are conducted at the site and all data is compiled and reported in the Brewery Creek annual water license reports.

Water samples for the current study were collected in a fast flowing section of the stream, prior to any other sampling activity. In-situ measurements were taken at each site. Conductivity, water temperature and pH were determined with a handheld Combo Hanna, Model # HI 98130 multi probe meter. Dissolved oxygen measurements were obtained with a YSI 550A dissolved oxygen meter. Instruments were calibrated daily.

All sample bottles were supplied by Maxxam Analytics in Burnaby, BC and obtained at the Brewery Creek site. To be consistent with the current water quality monitoring program being carried out at the Brewery Creek property, the same parameters were analyzed using the same laboratory. At each sampling location, water samples were collected in a one litre plastic bottle for the analyses of nutrients, dissolved anions and for physical tests. Samples to be analyzed for total metals were collected in 120 ml plastic bottles and preserved with nitric acid. Dissolved metals samples were filtered into 120 mL plastic bottles in the field and then preserved with nitric acid. Samples to be analyzed for total cyanide were collected in 120 mL plastic bottles and preserved with sodium hydroxide. Total and dissolved organic carbon samples were collected in 120 mL plastic bottles and preserved with sulphuric acid. The DOC sample was filtered in the field before preserving. Samples were kept cool prior to shipment to the laboratory. The analytical methods are provided with Maxxam's report in Appendix C.

As a measure of quality assurance and quality control (QA/QC), one blind duplicate was collected at one of the sample sites during the survey. Maxxam performs their own QA/QC and their report is included in the analytical report (Appendix C).

5.2 RESULTS

The in-situ data is provided in Table 5-1, Appendix C. All waters sampled were slightly alkaline and well aerated. Temperatures were relatively cool for mid summer and ranged from 2.9°C to 7.3°C. Due to the construction of a beaver dam a short distance downstream of Laura Creek at the ditch road, there was no flow at Laura Creek near the mouth. The section from the ditch road to the South Klondike River was thoroughly flown but no confined channel could be located. Photos are included in Appendix C.

Selected parameters portraying the water characteristics at each site are presented in Table 5-2 (Appendix C) with comparisons to the CCME guidelines for the protection of freshwater aquatic life.

Although cyanide has not been used on the property for several years, cyanide was detected at all of the sites and ranged from a low of 0.00075 mg/L at GP-3, Laura Creek, to 0.00133 mg/L at GP11, Brewery Creek. Cyanide can be found in nature and the detection at all sites is either an artifact of the laboratory analytical process or is naturally occurring throughout the study area.

The recommended guideline for arsenic was exceeded at GP-3, GP-5 and GP-6. A very high concentration of 147 ug/g was documented at GP-5, Classic Creek. The water at Laura and Lucky Creeks (GP-3 and GP-6) only slightly exceeded the guideline.

The guideline for cadmium depends on the hardness of the sampled waters and is determined using an equation. The calculated guideline was exceeded at all of the sites with the exception of GP-10 (Golden Creek at mouth) and GP-11 (Brewery Creek at mouth). The guidelines for copper and zinc were exceeded only at GP-6, Lucky Creek.

The guideline for iron was exceeded at GP-3, GP-6 and GP-8. With the exception of GP-11, all sites exceeded the guideline for selenium.

CCME guidelines are based on the total metal concentrations in the water. Lucky Creek had very turbid water (177 mg/L TSS) and several metals exceeded the guidelines. When the dissolved metals data was reviewed (Appendix C), cadmium and lead were not detected in Lucky Creek and arsenic, copper and zinc met the guideline.

6.0 STREAM SEDIMENT CHARACTERIZATION

6.1 BACKGROUND INFORMATION

As a requirement of Water Licence QZ96-007, stream sediment samples were collected on an annual basis from 12 sites until 2009. Stream sediments were collected from several of these sites during baseline studies undertaken in 1991 by Norecol (SRK, 1994) and Environment Protection (Davidge, 1995). An analysis of this database is not included in this report as it is being reported in a separate submission. However past data at some of the locations examined during the 2012 survey are discussed below in Section 6.3.

6.2 METHODS

Composite stream sediment samples were collected from several sites during the benthic invertebrate survey conducted in August 2012. Fine grained materials were collected from depositional areas using a stainless steel trowel and placed into plastic freezer bags. Samples were kept cool until shipped to Maxxam Analytical in Surrey, BC. At the lab the samples were dried and the portion passing a 100 mesh screen (0.15mm) was acidified and analyzed for 30 metals by ICPMS. The fine portion was targeted as this fraction has a higher potential for exposure to and ingestion by resident biota.

6.3 RESULTS AND DISCUSSION

The analytical results for the stream sediments are presented in Appendix D. Of the 30 elements analyzed, the concentrations of 20 of the metals were the greatest in the stream sediments collected from Classic Creek, indicating that it drains a highly mineralized area.

Seven metals were examined in detail as they may be present in the ore bodies and/or have the potential to be toxic to aquatic organisms (Table 6-1). The concentrations of these metals were compared to the CCME (1999) interim freshwater sediment quality guidelines (ISQG) and to the probably effects levels (PEL). Generally, concentrations greater than the PEL have a 50%

incidence of creating adverse biological effects.

TABLE 6-1 SUMMARY OF STREAM SEDIMENT METAL CONCENTRATIONS, 2012

Site #	Station Description	Arsenic ug/g	Cadmium ug/g	Copper ug/g	Lead ug/g	Mercury ug/g	Selenium ug/g	Zinc ug/g
GP-1	Lee Cr u/s Pacific Cr	**7.39**	**2.09**	**42.3**	8.48	**0.183**	1.89	**285**
GP-2	Lee Cr u/s Ditch Road	**8.05**	**3.25**	**52.2**	9.51	**0.269**	2.50	**345**
GP-3	Laura Creek u/s Ditch Road	**15.5**	**0.516**	16.2	7.30	0.058	0.60	71.9
GP-5	Classic Cr near mouth	**343**	**3.44**	**57.8**	14.3	<0.050	1.23	**251**
GP-6	Lucky Cr d/s road crossing	**27.1**	**1.08**	16.2	10.4	**0.257**	1.41	**145**
GP-8	Golden Cr d/s Lucky Cr	**14.7**	**1.29**	32.4	9.66	**0.247**	1.06	**152**
GP-10	Golden Cr near mouth	**13.3**	**1.22**	27.6	9.83	**0.182**	1.21	**162**
GP-11	Brewery Cr near mouth	**39.4**	**0.732**	31.4	14.7	0.107	0.79	95.5
ISQG		5.9	0.6	35.7	35.0	0.170		123
PEL		17.0	3.5	197.0	91.3	0.486		315

Note: ISQG = Interim freshwater Sediment Quality Guidelines, in **bold** where exceeded.
PEL = Probable Effects Level (>50% of adverse effects occur above this level), shaded and in **bold** where exceeded.

Arsenic has the potential to be an element of concern in the study area. The ISQG was exceeded at all sites and the PEL was exceeded at three sites (Classic, Lucky and Brewery Creeks). The concentration of arsenic at Classic Creek was extremely high, 343 ug/g, significantly greater than the PEL of 17 ug/g. To put this data into perspective, Environment Canada's database on metals in Yukon stream sediments was examined. Of 2,180 samples where arsenic was detected, concentrations ranged from 0.4 ug/g to 5,190 ug/g with a median of 17.1 ug/g. The very high concentrations of arsenic were found in the sediments of the Mt. Nansen and Ketza River mine areas.

The concentration of cadmium exceeded the ISQG in all of the streams sediments but all were below the PEL. Concentrations of copper slightly exceeded the ISQG in the stream sediments at both Lee Creek sites and at Classic Creek. Concentrations of lead were very low throughout the study area and were well below the ISQG at all of the sites. Mercury was detected at all of the sites with the exception of Classic Creek. The ISQG for mercury was exceeded at both of the Lee Creek sites, both of the Golden Creeks sites and at Lucky Creek.

Selenium has been identified as an element of concern at the Brewery Creek mine site but currently there are no sediment quality guidelines for selenium. Concentrations ranged from 0.60 ug/g at Laura Creek to 2.50 u/g at Lee Creek u/s of the ditch road (GP-2). Selenium is also included in Environment Canada's database. Of 1,011 sediment samples where selenium was detected, concentrations ranged from 0.1 ug/g to 38.8 ug/g with a median of 1.1 u/g. The high concentrations were documented in the Mac Pass region. The selenium concentrations reported during the 2012 survey all lay within close range to the median.

Zinc concentrations in the stream sediments ranged from 71.9 ug/g at Laura Creek to 345 u/g at Lee Creek u/s of the ditch road. The ISQG was exceeded at all sites except for Laura and Brewery Creeks and the PEL was exceeded at Lee Creek u/s of the ditch road.

Company stream sediment data exists for GP1, GP2, GP3 and GP6 from 1995 to 2009 and has been compiled for arsenic and selenium in Tables 6-2 and 6-3 respectively in Appendix D. Baseline data from 1991 and the current data for 2012 have also been included where applicable. Since Golden Creek at the mouth and Brewery Creek were sampled during the initial baseline surveys, these two sites are also included in the table. Graphs have also been generated and accompany the tables in Appendix D.

Arsenic concentrations have been consistently low at the Lee Creek sites (GP-1 and GP-2). Levels have fluctuated at Laura Creek (GP-3), frequently exceeding the PEL, but there appears to be a downward trend since 2000. Concentrations have varied considerably at Lucky Creek, GP-6. This could be attributable to the fact that this site has not been sampled at a regular location. Depending upon helicopter access, Lucky Creek has been sampled downstream of the Bohemian Zone. Currently there is no helipad on Lucky Creek and recently samples have been collected near the road crossing. The stream sediments at Lucky Creek have the highest concentrations of arsenic and are usually well above the PEL.

Interestingly, predevelopment baseline studies conducted in 1991 documented high arsenic levels (greater than the PEL) at Laura Creek, at the mouth of Golden Creek (GP-10) and at the mouth of Brewery Creek (GP-11). Arsenic is a naturally occurring element in the study area, however disturbance near Laura and Lucky Creeks may be creating an increase in concentrations.

There is a more limited set of selenium data as it was not analyzed in the early years. Selenium concentrations have been relatively stable with the greatest variation occurring at GP-3, Laura Creek. Over time it has had the lowest concentration of 0.05 ug/g in 2008 and the greatest concentration of 3.6 ug/g in 1997.

7.0 BENTHIC INVERTEBRATE SURVEY

7.1 BACKGROUND INFORMATION

Benthic invertebrate monitoring programs have been conducted on several occasions at the Brewery Creek mine site. Baseline studies were conducted in 1991 by Norecol (SRK, 1994), Environment Protection (Davidge,1995) and in 1994 (Burns, 1994). Loki/Viceroy/Alexco conducted routine benthic invertebrate monitoring programs as a component of the water license up until 2009.

The use of benthic invertebrates as a biomonitoring tool provides a useful measure in which to assess the health of a watershed. U nlike chemical measures, invertebrate assemblages reflect long-term exposure to varying water quality conditions and thus integrate effects of contaminants over time (Rosenberg and Resh, 1993). These organisms are useful in this respect as their abundance and taxonomic diversity respond to a wide range of impacts including sedimentation, organic loading and changes in chemical water quality. Using benthic invertebrates as biomonitoring tools offers many advantages for the following reasons; they are ubiquitous, they are abundant and easy to collect, there are a large number of species offering a spectrum of responses to environmental stress, they are generally sedentary and therefore are representative of local conditions, and they have long life cycles compared to other groups (i.e. periphyton). As such, benthic macroinvertebrates act as continuous monitors of the water they inhabit and therefore can serve as sentinels of change in local conditions. By assessing the benthos populations and their community composition and structure over time, from baseline conditions through to active mining, followed by decommissioning and then introduced exploration again, changes in the populations could indicate possible impacts to the receiving environments.

7.2 METHODS

To conform to all the previous benthic invertebrate sampling that has taken place on the property, the same method of organism collection was used during the 2012 survey. Triplicate samples were collected at each site using a Surber sampler (area = $0.0920m^2$) with a mesh size of 300 microns. The bed material within the frame was cleaned and washed by hand with the fast flowing current carrying the disturbed bottom fauna and detritus into the collection bag. The level of effort for each sample and at each site was comparable. The captured invertebrates and detritus was transferred from the collection bag to one litre nalgene bottles and preserved with 10% formalin. Samples were shipped by ground transport to an entomologist for sorting, identification and enumeration.

Analysis of the benthic invertebrate samples was conducted by Sue Salter of Cordillera Consulting in Summerland, BC.

7.3 RESULTS AND DISCUSSION

Sample site selection for the 2012 study did not totally overlap with previous studies. Additional watersheds were added. For example previous com pany sampling did not include collections from

Classic Creek or Brewery Creek. Brewery Creek has however been sampled once before in 1991 during the baseline survey conducted by Environment Protection (Davidge, 1995). It should also be noted that Brewery Creek did not lie within the previous claim block. Since Classic Creek drains the Classic ore body currently under exploration, it was deemed important to assess the benthic community here. A water quality and hydrology site has also been established here by Golden Predator.

The regular site on Golden Creek (BC-31) was not sampled although it does have past data. It was possible to find a suitable landing location just downstream of the confluence with Lucky Creek which contained a favourable riffle area for sampling. This site is much closer to the confluence of Lucky than BC-31 and any impacts stemming from influences from Lucky Creek could potentially affect benthic organisms at this location on Golden Creek. It is also upstream of a large tributary draining to the northeast. Considerable investigation did not produce a suitable landing spot near any riffle areas upstream of the confluence with Lucky Creek although this reach of Golden Creek was carefully flown. The regular site, BC-36, was examined but due to its morphology (steep banks, high velocity, deep water, large boulders) benthic invertebrates could not be collected here and only water samples were collected.

Another site on Golden Creek was established near the mouth. This lies below the west fork of Golden Creek where a water quality site, BC-72, has been proposed. Portions of this stream drain the Sleeman's deposit. The sample site established near the mouth, GP10, will capture all influences to Golden Creek. Benthos was also collected here in 1991.

In-situ conditions at the time of benthic invertebrate collection are included in Table 5-1 in Appendix C.

The taxonomic data had not been received from the entomologist by the time of the submission of this draft and therefore further reporting is not currently possible.

8.0 FISHERIES

8.1 BACKGROUND INFORMATION

Fisheries investigations in the study area were initially completed in the early 1990s as part of the environmental baseline characterizations associated with the establishment of the Brewery Creek Mine. The former mine site was largely a greenfield development and the studies were geared to determine fish utilization habitat characterizations of the principle drainages in the area (Norecol 1991, Norecol Dames and Moore 1993; Steffen Roberson and Kirsten 1994). These studies provided baseline information on fish assemblages and habitats within the Brewery Creek project area, with a focus on the major drainages in the region (Golden Creek, Laura Creek, Lee Creek, Pacific Creek, and the South Klondike River). Additionally, metal contaminants in the fish on Lee Creek were part of a study by Steffen Robertson and Kirsten (1994). The study concluded low concentrations of metal contaminants in the fish that were tested. With the change of ownership of the mining property in the late 1990s subsequent fisheries surveys focused on the same principle drainages (Access Mining Consultants Ltd and White Mountain Environmental Consultants 1999). A further study of metal c ontaminants was completed by Access Consulting Group on lower Laura Creek and the South Klondike River in August of 2001 to gather fish samples for the study. The objective of this project was to collect several fish from watercourses draining the Brewery Creek mine site and analyze their tissues for metal concentrations, particularly mercury. These concentrations were thought to provide background fish tissue data and allow a comparison to applicable national and international guidelines.

It's long been known that the Klondike River is an important salmon spawning stream (Mercer 2011; R.L.&L 1989). Chinook salmon (*Oncorhynchus tshawytscha*) have previously been observed spawning in the mainstem of the South Klondike River but not in the side channels that are more typically used by chum salmon (*Oncorhynchus* keta). Other fish species that have been previously documented in the Klondike River watershed include Arctic grayling (*Thymallus thymallus*), burbot (*Lota lota*), inconnu (*Stenodus leucichthys*), round whitefish (*Prosopium cylindraceum*), slimy sculpin (*Cottus cognatus*), and longnose sucker (*Catostomus catostomus*) (DFO 2011; Norecol Dames and Moore 1993). Based on the predicted habitat suitability and restoration standards associated with the Yukon Placer Authorization, the mainstem and side channels of the South Klondike River, as well as the low gradient reaches of Lee, Golden and Brewery creeks are classified as high habitat suitability for fish (Yukon Placer Secretariat 2011). The upper reaches of Laura, Lucky and Pacific creeks are classified as low habitat suitability. The mainstem of Lee Creek is also an area of special cultural consideration.

Past studies have suggested Lee Creek as having excellent fish habitat values and abundant opportunities for spawning and rearing of fish in most areas of the stream (Norcol Dames and Moore 1993). The study also concluded there were significant numbers of Chinook fry utilizing the lower reaches of Lee Creek, below the Klondike Ditch Road, during July and October. The study suggested that the remains of a wooden weir on the mainstem of Lee Creek appeared to be acting as a fish barrier, with only slimy sculpin observed upstream of the structure. The weir was removed in 1992 but only slimy sculpin were seen, or caught in Lee or Pacific Creek (a tributary of Lee Creek) during the 1993 investigations. A subsequent survey in 1999 by Viceroy Mineral Corporation observed Arctic grayling and captured slimy sculpin upstream of the old weir site, in the vicinity of the Klondike Ditch Road Bridge crossing.

Investigations of Laura Creek suggest the stream does not contain any suitable fish habitat except near the outlet. The presumption, based on several observations, is that the lower channel of Laura Creek is intermittent, with only seasonal surface flows reporting to the South Klondike River (Norecol 1991; Steffen Robertson and Kirsten 1994). When water is present at the outlet there is potential for fish originating from the Klondike River to utilize the resulting inundated habitat (Viceroy Mineral Corporation 1999). However, nearly all of the studies to date have observed summer flows in Laura Creek becoming subsurface before reaching the South Klondike River posing a barrier to fish movement.

Golden and Brewery creeks are presumed to contain excellent quality fish habitat however fish have yet to be documented in these streams. There continues to be speculation that beaver dams specifically in Golden Creek act as barriers to the upstream movement of fish originating from the Klondike River. Steffen Robertson and Kirsten (1994) did not capture any fish in Golden Creek and further concluded none may be present above the beaver dams (Norecol Dames and Moore 1993).

8.2 METHODS

8.2.1 Fish Habitat and Utilization Assessment

Four sites on Lee Creek (including the confluence with Pacific Creek), one site on Pacific Creek, one site on Laura Creek, two sites on Golden Creek and one site on Brewery Creek were sampled for the presence of fish through August 7th to 10th, 2012. These sites represent part of a larger environmental network used for previous baseline studies in the study area. Fish habitat descriptions and metrics were recorded at locations where fish were captured or reported previously. Measurements were collected using methodology described in the Stream Survey Toolkit prepared by the BC Ministry of Sustainable Resource Management (RISC 2004).

Fish sampling was conducted under a permit obtained from Fisheries and Oceans Canada. Each sampling site was accessed either by vehicle using access roads or with the aid of a helicopter. A Smith Route LR-24 battery powered electroshocker was the primary method used for establishing fish presence. A minimum of 150 seconds of active shocking time was completed at each site. In addition, six baited Gee type minnow traps were set overnight at each site using methods described by the Yukon River Panel (2007). Minnow traps were set in scour pools, behind boulders, in undercut banks or where woody debris offered cover for fish. Angling and beach seining were also conducted where feasible. Angling employed the use of flies and/or small spinners. The seine net was 7 meters in length and constructed of 6.3 mm (¼ inch) mesh.

Captured fish, except those that were retained for metal analysis, were identified, enumerated and measured for a total or fork length (± 1 mm), weighed (± 0.1 gm) using a digital scale and subsequently live-released at site of capture.

8.2.2 Fish Tissue Metal Sampling

At minimum of six slimy sculpin were retained from Lee, Golden and Brewery creeks for whole body ICP metal analysis. Additionally, four Arctic grayling were obtained from Lee Creek. In most cases the largest specimens from each capture site were euthanized and placed in individual ®Whirlpac plastic bags. Collections were immediately placed on ice and subsequently frozen within 12 hours. For shipment, samples were packed with ice packs and couriered to Maxxam Analytics Laboratory in Burnaby, British Columbia. Analytical results were expressed in wet weights for comparison with guidelines, previous studies, and other sites throughout Yukon and Alaska.

8.3 RESULTS AND DISCUSSION

8.3.1 Brewery Creek

This watershed represents the largest drainage in the study area. The single sample site (GP-11) on Brewery Creek had the largest average channel width of 31.2 m with pools that were too deep to wade (Table 1, Figure 2 in Appendix E). Fish cover was abundant and dominated by accumulations of small woody debris and deep pools. Other cover types included the occasion large timber in the active channel, undercut banks and a well-established riparian zone that offered an abundance of overhanging vegetation. The slope of the main channel was modest at about 1.0 percent. Streambed material was dominated by cobble-sized armor with slack water regions containing aggregations of clean gravel. The channel was unconfined by the valley walls and meanders were sinuous with a well-developed riffle-pool sequence. Pools were located on the outsides of bends with riffle crossovers on the opposite margin of the stream. Islands were infrequent and large gravel bars along the sides of the channel were common. Captured fish included 6 juvenile Chinook salmon ranging in size from 53 to 58 mm in fork length, 13 slimy sculpin from 26 to 91 mm in total length and 1 juvenile burbot that was 210 mm in total length. Fish were generally in low densities based on frequency of capture in the various gear types (Table 2, Appendix E). Arctic grayling appeared to be absent although the habitat was ideally suited for this species.

8.3.2 Laura Creek

Only one site on Laura Creek was sampled (GP-3) for the presence of fish, as the second site near its confluence with the South Klondike River was dry (Figure 2, Appendix E). An aerial inspection of the drainage revealed flow in the stream became subsurface in an area that was heavily modified by beaver activity just downstream of the Ditch Road (Figure 3, Appendix E). The same situation has been noted in the past by other researchers (Steffen Robertson and Kirsten 1994). With no surface connection to the South Klondike River there would be no means for any movements of fish between these drainages with Laura Creek being an isolated drainage. Laura Creek is the smallest watershed in the project area. Its channel width at the Ditch Road sampling site was only 3.2 m with a gradient of only 1.1 percent as the stream at this location is flowing within the South Klondike River valley floor. Cover for fish was low and largely in the form of overhanging vegetation and beaver accumulations of small woody debris. Other cover types included scour pools and undercut banks. The riparian vegetation primarily consisted of dense stands of alder and willow providing a crown closure of between 71 to 90 percent of the stream (Figure 4, Appendix E). The substrate was dominated by fines, mainly organics, with the occasional accumulation of gravel. The D_{95} was 12 cm, the smallest of the surveyed sites. The meanders were tortuous and there were many small barriers creating a step-pool channel type morphology. The streams were generally unconfined although sections were deeply incised by the banks. There was the occasional gravel bar along the margins of the channel. No fish were captured in this stream despite considerable effort using the electrofisher and minnow traps (Table 2, Appendix E).

8.3.3 Lee Creek

Three sites on the mainstem of Lee Creek (F-1, GP-1 and GP-2) were surveyed. Sampling sites were equidistantly spaced from the mouth by about 2.5 kilometers. Channel width averages ranged from 11.3 m at GP-1 near the Pacific Creek confluence to 14.1 m at site GP-2 at the Ditch Road Bridge. Residual pool depths were high throughout the channel and ranged from 0.4 m to 0.6 m in depth. The highest stream gradient was located at site GP-1 where it was determined to be 1.1 percent. The other sites were low in gradient measuring only 0.4 percent. Cover for fish was abundant at all sites. Primary cover types were small woody debris, overhanging vegetation and undercut banks. Deep pools were the primary subdominant cover type. These deep pools, when combined with aggregations of small and large woody debris, offered excellent fish cover. Banks were well vegetated at all sites and mainly composed of grasses and shrubs. Deciduous trees were especially conspicuous at site GP-2 (Figure 6, Appendix E). Instream vegetative types that included mosses and algae were commonly observed at all sites. Cobble was the dominant substrate at site F-1 near the confluence with the South Klondike River. Sample sites further upstream were primarily composed of gravels. Fi nes were more prominent at the most upstream site GP-1 near the confluence with Pacific Creek. The channel through the three samples sites was a riffle pool sequence that had regular and sinuous meanders. There were occasional islands observed and bars were primarily along the sides of the channel. The stream was largely unconfined as it flowed along the valley floor of the South Klondike River. A total of 37 slimy sculpin were captured at the three sites sampled in Lee Creek. Slimy sculpin were captured at about the same frequency at all three sites with sizes ranging from 33 to 95 mm in total length. Juvenile Chinook salmon were only captured at site F-1 near the South Klondike River confluence. Juvenile Chinook salmon were 0+ in age based on their size and ranged from 54 to 65 mm in fork length. Arctic grayling sub adults and adults ranging in size from 273 to 400 mm in fork length were only captured at site GP-2 near the Ditch Road Bridge. This site is above the old weir that was believed to be a barrier prior to its removal in the early 1990s. The species that were captured during this assessment have all been previously documented in the steam by other surveys (Viceroy Mineral Corporation 1998; Steffen Robertson and Kirsten 1994).

Pacific Creek, a tributary of Lee Creek, was also briefly assessed during the survey. With the exception of a small section of accessible habitat at the confluence with Lee Creek, habitat quality is generally poor throughout the drainage. At site PC-2 there were several obvious barriers with one section of the stream flow becoming subsurface. The stream channel averaged less than 1 meter in width at this location (Figure 7, Appendix E). Further downstream at the confluence the channel width was 6 meters however the plethora of deadfall in the stream likely posed a barrier to any upstream movements of fish. The channel meandered irregularly and was also deeply incised at this location. Peat moss and areas of permafrost were common features in this small watershed and the substrate was almost entirely composed of fines. Only modest numbers of slimy sculpin have been documented at the mouth of this small tributary where the gradient is low. The gradient at site PC-2 was estimated to be 5.9 percent. No fish were captured in Pacific Creek during this survey.

8.3.4 Golden Creek

Only a single site (GP-10) on the mainstem of Golden Creek was surveyed (Figure 8, Appendix E). The surveyed site (GP-10) was a 100 m section of the stream near South Klondike River confluence. The average channel width at this location was approximately 8.7 m suggesting a sizable watershed. Residual pool depths averaged 0.5 m which was deep enough to provide for some excellent fish cover. The stream gradient was low and estimated to be only 0.7 percent. Overall, fish cover was abundant and primarily composed of small woody debris. Other cover types included undercut banks, large timbers and overhanging vegetation. Bank vegetation consisted of grasses and shrubs with sections bounded by a mature conifer forest. Cobble dominated the substrate although gravel was commonly observed in slack water areas along the stream banks. The unconfined channel was a riffle pool sequence with irregular meanders. Exposed side bars were few and a beaver dam spanned the creek approximately 200 meters upstream for the confluence. The beaver dam may serve as a partial barrier to the upstream movement of fish. Three species of fish were captured at this location. This included 1 burbot that was 215 mm in total length, 6 juvenile Chinook salmon ranging in size from 54 to 64 mm in fork length and 26 slimy sculpin ranging in size from 53 to 83 mm in total length. The juvenile Chinook salmon were presumed to be 0+ in age. Fish have never been documented previously in Golden Creek.

Lucky Creek, a headwater tributary of Golden Creek, was also briefly assessed during the survey. The assessment site (GP-6) was located along an access road that crossed the creek northwest of the mining camp (Figure 9, Appendix E). The stream channel averaged about 0.3 m in width away from the disturbed area associated with the road crossing. The installed culvert was perched with a plunge pool and the stream at the time of the survey was being used as a water source for a drill program in the local vicinity. The channel was deeply incised by the valley walls and was a step pool configuration. The stream gradient at this location was estimated to be 4.0 percent. There were many potential barriers observed downstr eam of the culvert. Fish habitat values were low in this small tributary stream. No fish were captured at this location.

8.3.5 Metal Contaminants in Fish

The laboratory results of chemical analysis of 4 Arctic grayling originating from Lee Creek and 18 whole body slimy sculpin collected from Lee, Golden and Brewery creeks are presented in Tables 3 and 4 in Appendix E. The Arctic grayling that were analyzed represented a size that would be typically consumed by anglers. With the exception of methyl mercury, there currently are no Canadian fish tissue residue guidelines for the protection of wildlife consumers of aquatic biota for all of the elements tested. However, for a small number of the most toxic elements, fish tissue residue guidelines have been prepared for chemical contaminants and toxins in fish and fish products for human consumption.

The current CCME (1999) guidelines for the protection of wildlife consumers of aquatic biota address those substances for which aquatic food sources are the main route of exposure. These guidelines apply to any aquatic species consumed by wildlife, including fish, shellfish, invertebrates, or aquatic plants. To date, only a few substances have had a guideline developed and include DDT, Dioxins and Furans, PCBs, Toxaphene and Methylmercury. These substances are known to bioaccumulative and can be persistent in aquatic food chains. The recommended guideline (TRGs) for these persistent pollutants represent the tissue residue concentration of the contaminant in an aquatic organism that is not expected to result in adverse effects in predaceous wildlife. Conversely, the Canadian Food Inspecti on Agency (2009) has also developed TRGs for chemical contaminants and toxins in Canadian fish and fish products. These guidelines were prepared to promote product and process standards that contribute to the achievement of acceptable quality and safety of fish and seafood products in the consumer marketplace. For comparative purposes, the values for three of the elements (arsenic, lead and mercury) listed by the Canadian Food Inspection Agency were compared to concentrations determined for fish sampled from the three separate drainages in this study.

For simplicity, seven of the most toxic contaminants in the aquatic environment (Arsenic, Cadmium, Copper, Lead, Mercury, Selenium and Zinc) were chosen for presentation. Each of these contaminants has varying toxicity to fish and other aquatic organisms depending on their molecular form. Table 5 (Appendix E) summarizes the average residue found in slimy sculpin and Arctic grayling samples collected from each separate drainage. The values are then compared to both the CCME guideline for wildlife consumers and Canadian Food Agency fish tissue guideline. While these guidelines are specifically intended to protect human health or protect wildlife consumers of aquatic biota, they do provide some use in evaluating the levels found in this assessment. Additionally, databases of fresh water fish (INAC 2009; USGS 2011) were also presented to provide an overview of the range of values found naturally in other freshwater populations in other freshwaters of the Yukon Territory and the Yukon River Basin.

Arsenic concentrations for individually of all samples were generally low in comparison to the mean and maximum concentrations from the IN AC and USGS databases. Individual values ranged from a low of 0.013 ug/g for Arctic grayling in Lee Creek to a high of 0.47 ug/g for a single slimy sculpin from Brewery Creek. The Canadian guideline for the consumption of fish and fish products is currently set at 3.5 ug/g, which is well above the concentrations found in this study and the other databases.

Cadmium concentrations were also generally low for all samples. The maximum concentration recorded was 0.198 ug/g for a slimy sculpin from Lee Creek. Arctic grayling had the lowest values averaging 0.016 ug/g. Average values for the drainages were below the mean and maximum cadmium concentrations reported from fish in the INAC and USGS databases.

Sculpin copper concentrations were consistent and did not exceed 1.28 ug/g. Average concentrations were the lowest in Arctic grayling at 0.518 ug/g. Overall concentrations were generally below the INAC database for average sculpin concentrations but above the USGS database for freshwater fish from the Yukon River.

Lead concentrations in slimy sculpin were generally low in comparison to the mean and maximum concentrations in whole body sculpin from the INAC and USGS databases. The highest concentration was 0.156 ug/g found in a slimy sculpin from Brewery Creek. The Canadian guideline of lead for the consumption of fish and fish products is 0.5 ug/g.

Mercury in fish is almost entirely methylmercury (Rodgers 1994). Methylmercury is a neurotoxin, and the form of mercury that is most easily bioaccumulated in organisms. Mercury concentrations in Arctic grayling and slimy sculpin in Golden Creek averaged higher than the Environment Canada tissue residue guideline of 0.033 ug/g for wildlife consumers. All sites were also above the averages of the INAC and USGS databases but well below the well as the Canadian guideline of 0.5 ug/g for the consumption of fish and fish products. The highest concentration for an individual fish was 0.073 for an Arctic grayling sampled from Lee Creek.

Average selenium concentrations in fish were consistent between drainages and did not exceed 2.18 ug/g. Concentrations in the INAC and USGS databases average 1.7 ug/g and 0.51 ug/g, respectfully. The highest concentration for an individual fish was 2.84 ug/g from a slimy sculpin sampled in Lee Creek.

Zinc concentrations in sculpin were relatively consistent between drainages attaining a maximum concentration of 36.4 ug/g for a single sculpin sampled in Golden Creek. Concentrations of zinc reported in Arctic grayling were generally lower than those for sculpin. The average concentration in sculpin reported in the INAC database was 42.2 ug/g with a concentration maximum of 187.1 ug/g reported in a sculpin from VanGorda Creek. The USGS database for other freshwater fish averaged 34.8 ug/g with a maximum of 56.4 ug/g reported for a single fish.

Concentrations of arsenic, cadmium, lead, copper, mercury, selenium and zinc did not appear to be elevated in any particular drainage. Notable, however, were differences in the concentrations of copper, lead, and zinc between Arctic grayling and slimy sculpin. Overall concentrations of these three metals were higher in sculpin and may be reflective of the natural background levels in these streams. Sculpin are not known to be migratory and generally have a much smaller range than Arctic grayling.

9.0 REFERENCES

Access Mining Consultants. 2011. Regulatory A pprovals Procurement and Baseline Data Gap Analysis for Recommencement of Mining Ac tivities, Brewery Creek Project, Yukon Canada. Prepared for Golden Predator Group, Whitehorse, Yukon.

Access Mining Consultants. 1999. *Vegetation Characteristics - Bohemian and Big Rock Ore Zones - Brewery Creek Mine*. Whitehorse, Yukon, Canada.

Burns, Bonnie. 1994. *Benthic Invertebrate Baseline Study at Brewery Creek, Y.T.* Laberge Environmental Services. Prepared for Loki Gold Corporation.

Canadian Council of Minister of the Environment. 1999. *Canadian Environmental Quality Guidelines*. Canadian Council of Ministers of the Environment, Winnipeg, Canada.

Canadian Council of Resource and Environment Ministers (CCREM). 1987. *Canadian Water Guidelines. Task Force of Water Quality Guidelines*. Ottawa, Canada.

Canadian Food Inspection Agency. 2009. Canadian guidelines for chemical contaminants and toxins in fish and fish products. Web site: http://www.inspection.gc.ca/english/fssa/fispoi/man/samnem/app3e.shtml

Cody, W.J. 1996. *Flora of the Yukon Territory.* NRC Research Press, Ottawa, Ontario, Canada

Davidge, D. March. 1995. *Baseline Study of Water Quality, Sediments and Benthic Fauna of Selected Streams in the Brewery Creek Area, Yukon, Loki Gold Corporation*. Regional Program Report No. 95-02. Environmental Protection, Yukon Branch.

DFO. 2011. FISS database. Fish Habitat Management Branch, Fisheries and Oceans Canada, Pacific Region.

Government of Yukon. 2009. Dawson Land Use Planning – Summary Report 6pp. Yukon Environment, Dawson City, Yukon.

INAC. 2009. Northern Contaminants Program (NCP) – Yukon Database. Whitehorse, Yukon.

Kennedy, C. and J. Staniforth. 1991. *Klondike Valley Plan* maps and notes. Department of Renewable Resources, Government of Yukon. Unpublished.

Kienzler, Martin. October 2005. *Hart River Caribou and Porcupine Caribou Fieldwork*, Fall 2005. Letter report, Yukon Environment, Dawson City, Yukon

Kienzler, Martin. Nov 2, 2005. Email correspondence. Wildlife Technician, Dawson City, YT.

Larsen, D.G. and R.M.P. Ward. 1991. Moose population research and management studies in Yukon: Moose population characteristics in the Dawson City Area. Survey report, Yukon Fish and Wildlife Branch, Whitehorse, 46 pp.

Mercer, B. 2011. 2010 Klondike River DIDSON Sonar. Project Number CRE-16-10. Prepared for the Yukon River Panel, Restoration and Enhancement Fund. March 2011. 26 p.

Norecol. 1991. Loki Gold Corporation – Brewery Creek Project. Environmental Baseline.

Norecol Dames and Moore. 1993. Loki Gold Corporation – Brewery Creek Project. Environmental Baseline.

RISC. 2004. Stream Survey Toolkit. Prepared by the BC Ministry of Sustainable Resource Management, Aquatic Branch Prepared for the Resource Inventory Standards Committee (RISC). March 2004 Ver.1

Rodgers, D. W. 1994. You are what you eat and a little bit more: bioenergetics-based models of methylmercury accumulation in fish revisited. In: Mercury pollution: Integration and synthesis, C.J. Watras and J.W. Huckabee, eds. Lewis Publishers, Ann Arbor, MI. pp. 427-439

Rosenberg, David M. and Vincent H. Resh. 1993. *Freshwater biomonitoring and benthic macroinvertebrates*. Chapman & Hall Inc. New York.

Steffen Robertson and Kirsten Inc. July 1994. *Loki Gold Corporation Brewery Creek Project Initial Environmental Evaluation, Supporting Document II Environmental Baseline*.

USGS. 2011. Biomonitoring Environmental Status and Trends (BEST) Large Rivers Monitoring Network. Web site: http://www.cerc.usgs.gov/data/best/search/ [accessed November 2012]

Viceroy Mineral Corporation. 1999. Fish Habitat and Utilization Assessments – Brewery Creek Mine Site Vicinity 1997-1998, Lower Laurs, Lee and Pacific Creeks. Prepared by White Mountain Environmental Consultants and Access Consulting Group, April 1999.

Yukon Ecoregions Working Group. 2006. *Biophysical Properties of Yukon Landscapes*. Agriculture and Agri-Food Canada, Research Branch. PARC Technical bulletin 04-01.

Yukon River Panel. 2007. Protocol for collection and reporting of data from juvenile salmon sampled in Canadian R&E Projects. Prep. for the Yukon River Panel by Fisheries and Oceans Canada. 1 p.

Yukon Placer Secretariat. 2011. Energy, Mines and Resources. Yukon Government. Website: http://www.yukonplacersecretariat.ca [Accessed: October 2011]

Wildlife Sighting Report

Please report any wildlife you see in the area!

This is to be taken seriously! No mythical creatures.

Date	Wildlife	Location
Feb 16, 12	2 Moose	Ditch Road Northfork
Feb 18, 12	1 MOOSE	North Fork Entrance
Feb 21, 12	Fox	Camp
Feb 24, 2012	Fox (trapped + relocated up the Dempster)	Camp. Collin
Feb 28	Fox (Relocated)	CAMP
Feb 28	Moose	Ditch Road 5 km
MAR 1, 12	FOX!	CAMP
Mar 5, 12	MOOSE	Trail Bridge OD
Mar 5. 12	Relocate Fox	Camp OLIX12 OP
Mar 16 12	Relocate Fox	Warren, CAMP
March 19	MOOSE	River Bridge
March 23	Fox	Out By Recycling
[illegible]	[illegible]	[illegible]
24	Lynx	Northfork Rd
01/04/2012	Fox	Camp
Apr 6 12	Wolf	North Fork Rd
April 23	Momma & baby moose, porcupine, grouse	North Fork Rd.
~~April 24~~	~~Sasquatch!~~	" " "
April 17-25	2 lynx, 6 willow ptarmigan 3 porcupine	many foxes around here
April 26	2 Moose	North Fork Road
April 27	3 bears Mommy & two cubs	4k from Camp.
April 30	2 black bears	in camp
MAY 1	BLACK Bear	N. Fork Road
May 1	Black bear	In camp
"	Porcupine	"
May 3	Black Bear	North Fork road
May 4	DK Fox	Camp
May 3	Black Bear	Camp

GOLDEN PREDATOR
YUKON'S GOLD COMPANY

WILDLIFE OBSERVATI .N LOG

Form 5.57

Rev 00

Date	Witness	Type of Animal	Number	Location	Actions Required	Deterrents Used Y/N?	Incident Report Submitted?
May 6		bear	1	Out of Camp	NO		
May 7	Jeremy	bear	1	Nth Fk Rd.	none	Horn	no, 8:30 AM
May 7	Cathy et H	Moose	1	"	"	"	no 7:15 AM
8		Moose	1	"	None	NO	NO
7	KARI	PORCUPINE	1	~500m past fuel station	NONE	NO.	NO.
8	Amanda	Porcupine	1	Km 6	none	NO	NO
8	Jeff S	2-moose	2	Km 5	None	None	None
8	Jeff S	Bull Moose	1	Km 5	None	"	"
9	Jeff S.	moose	1	Km 5	None	"	"
16	Jeff S.	Bear	1	CAmp	chase away	horn	NO
16	Jeff S	Bear	1	Km 3	None	NO	NO
20	Randy P	Bear	1	Km 20	chase Away	No	No
20	MADO & Kristen	Bear/Bull moose		NorthforkRd	none	no	no
20	MADO & Kristen	3Porcupine 2rabbits		NorthforkRd	none	no	no
22	Daniel Reti	BEAR	1	3 MILES DOWN	None	No	NO
23	Jeff S	Lynx	1	3 Km	None	NO	NO
23	Daniel Reti	birds	37	OFFICE AREA	NONE	No	No
23	Monica N	mice	2	core shack	traps	No	No
	SHAUN O	BOIDS	Many	office	duck hunt		
29	Jeff S.	Moose	1	Km 4	None	No	NO
29	Jeff S.	Bear	1	Km 16	None	NO	NO
1	Will Y	BEAR	1	0	SHOOT	YES	NO
2	SHAUN	Porcupine and Fox	1 each	By MSum laydown	Take bad pictures (N)	N	NO

Always ensure personal safety when in the vicinity of wild animals.

GOLDEN PREDATOR
YUKON'S GOLD COMPANY

WILDLIFE OBSERVATION LOG

Form 5.57

Rev 00

Date	Witness	Type of Animal	Number	Location	Actions Required	Deterrents Used Y/N?	Incident Report Submitted?
JUNE 1	RYAN	MOOSE	5	NORTH FORK	SLOWED DOWN	No	
June 3	Neil/Erin	Bear BL	3 2 yrl	Lower Forks	—	—	—
June 4	CS	MOOSE	1	Incinerator	Called it in	NO	
6		GRIZ.	1	Km 3 main Rd			
June 12 2012	ZG.	Moose	1	Feul	Stood + watched	No	—
JUNE 13/12	DON	B. BEAR	1	Kokanee Pit	NONE	No	No
June 15/12	Z.G.	2 porcupines	2	[illegible]	Slowed down		
June 17/12	Fred	Bear Bl.	1	2km from camp.			

Always ensure personal safety when in the vicinity of wild animals.

Note: All printed copies of this document are uncontrolled.

Appendix F – Geotechnical Inspection Reports

Our File: 2012-600

3 October 2012

Golden Predator Corporation
1 Lindeman Road
Whitehorse, YT
Y1A 5Z7

Attention: Ms. Jillian Chown, Environment Permit Coordinator

Re: September 2012 Engineering Inspection – Brewery Creek Mine

The following provides the results of the engineering inspection completed at the Brewery Creek Mine on September 19 and 20, 2012.

1. Introduction

The inspection was completed by Victor Menkal, P.Eng. who was accompanied by Ms. Jillian Chown, Environment Coordinator for Golden Predator Corp.

The primary intent of the work was to inspect waste rock dump reclamation works and various civil works structures including:

- Ore on pad,
- Leach pad containment dyke,
- Process ponds,
- External waste dumps,
- Water retaining structures,
- Overflow and drainage structures and
- Haul road and associated drainage works.

Attention was given to potential areas of concern identified in previous annual inspections, specifically the November 16, 2010 inspection report prepared by SRK Consulting (Canada) Inc. (Mr. Peter Mikes, P.Eng.).

The mine site plan is attached in addendum A and the photo documentation of the site visit is attached in addendum B. Photos are referenced by UTM coordinates, elevation and azimuth direction.

2. Haul Roads

The primary haul road extends approximately 7 km from the Ore On Pad to the Lucky Pit with stream crossings and specific areas of interest noted as follows:

2.1 Stream Crossings

Six stream crossings on the road alignment were inspected with photo documentation presented in plates 1 to 10.

The stream crossings generally consist of shallow swales in the road with riprap armour upstream and downstream of the crossing. The crossings were noted to be in good condition with recent maintenance and grading.

There was evidence of recent washouts at KP 1.8 and KP 3.2 that have been repaired (plates 6, 7 & 8). The riprap immediately downstream of the crossing appears to have been effective at reducing the migration of embankment materials downstream of the crossing.

The use of swales is consistent with the seasonal use of the road as personnel are not on site to thaw culverts during the spring thaw – freeze cycles.

A 150mm HDPE pipe conveys water under the road embankment from the Upper Fosters to the Lower Fosters Pits (plates 9 & 10). The road is in good condition at the crossing with no visible settlement or channeling by the pipe. Immediately after crossing the road, the water flows over a bedrock embankment and into the Lower Fosters Pit. The bedrock appears to be effective in preventing excessive erosion at the discharge.

2.2 Lucky Haul Road Slope Instability

Movement of the Lucky Haul Road was identified during the engineering inspection in 2003 and Viceroy, the mine operator at this time, undertook remediation works by moving riprap material from the existing road crest and reinforcing the unstable slope. Riprap material moved from the road crest was placed on the north slope and a toe berm constructed along the entire embankment.

The riprap slope was measured in the field with handheld electronic inclinometer at approximately 40 degrees. The shoulder of the road is located approximately 5 to 10m from the embankment break.

The old slip failure is still visible on the southwest end of the slope. There does not appear to be any change in this failure from previous photographs. The inspection did not reveal any visual signs of recent material movement, displacement of vegetation, tension cracks or sloughing on the slope or road embankment.

The 2010 inspection recommended placement of survey monuments to permit monitoring by survey as well as photo journals. At the time of the inspection, no survey monuments were observed.

Due to the height of the embankment, the relatively steep slope and previous history of slides in this area it is recommended that survey monuments be placed as previously recommended and a survey record maintained of the site. As well, if it is intended to upgrade for future heavy haul, a slope stability analysis should be completed as part of the road upgrade design.

2.3 Pacific Pit Overflow Sinkholes

The 2010 inspection noted possible sinkholes west of the Pacific Pit overflow (north of Blue Dump). It appears that the road has been repaired in this area and no sinkholes or embankment failures were noted during the inspection (plates 15 and 16). The drainage channel and road embankment for the Pacific Pit overflow were also inspected and found to be stable with no visible signs of erosion or instability. The drainage channel is lined with riprap 0.1 to 0.3m in size.

2.4 Bohemian Access Trail

The 2010 inspection report identified possible movement or failure of the scarp on the Bohemian Access. It appears that remedial works have been completed and the area regraded since the inspection. The re-contoured slope appeared to be stable with no signs of distress during the 2012 inspection.

3. Mine Pits

3.1 Blue Pit Dump

The Blue Pit waste rock dump has been graded, covered and vegetated with healthy plant growth observed throughout the site. The Blue Pit overflow structure, riprap erosion protection and toe of berm was inspected and no visible signs of erosion, settlement or material movement observed. Based on the 2010 site photos, it appears that additional riprap has been placed in drainage control channels that had been previously noted to be eroding.

Some erosion gullies were noted at the base of the dump adjacent and above the old access road with depths from 0.1 to 0.5m deep. Most of the gullies have heavy vegetation indicating minimal erosion over time but it is suggested that additional riprap and ditch checks are warranted in areas of obvious erosion.

Reclamation vegetation appears to be successful over most of the Blue Dump except for an area approximately 100 square meters above the old access road at the base of the dump where steeper slopes and thus higher energy runoff may have displaced seeds. It would be of value to reseed this area and possibly place cobbles or coarse granular material to reduce the erosion potential during spring freshet and heavy rainfall events.

3.2 Moosehead Pit

The Moosehead Pit does not have a waste rock dump and the inspection was limited to the overflow channel (plates 20 & 21, addendum A).

Riprap material 100mm to 300mm diameter has been placed across the full width of the overflow channel. The channel appeared to be stable with no signs of erosion or instability in the channel. The discharge from the over flow is to an area with trees and ground cover with no signs of erosion noted.

3.3 Upper Fosters, Lower Fosters Canadian Pit & Kokanee Pits

The Upper Fosters, Lower Fosters, Canadian Pit and Kokanee waste rock dumps have been contoured and covered with well established reclamation vegetation cover and no apparent signs of erosion or slope instability (plates 9, 22, 23).

3.4 North Golden Pit

The North Golden pit has been reclaimed with vegetation well established on the reclaimed waste rock. Some minor erosion gullies were noted on the northwest extremity of the waste rock dump (plate 25) which should be restored with placement of additional riprap in the gullies and seeding on the exposed slope.

3.5 Lucky Pit

Extensive remediation has been undertaken at the Lucky Pit with heavy ground vegetation established on the graded and covered waste rock dumps (plates 27, 28 & 29).

No apparent signs of erosion or instability were observed in this area.

4.0 Ore On and Heap Leach Pads and Containment Dyke

No cyanide has been added to the heap leach pad since 2002 and all cells were graded, covered and vegetated since the cessation of mining operations (plates 31, 32 & 33). No visible signs of erosion or instability were noted on the stockpiles or pads during the inspection.

As part of the site remediation, the heap leach containment dyke was breached above the pond formerly used to contain pregnant solution from the heap leach process (plate 34) to allow free drainage without impoundment behind the dyke.

The 2010 inspection identified some tension cracks in the containment dyke immediately to the north of the breach. This area was inspected during the site visit and the cracks were noted to be minor and covered by heavy vegetation. There were no visible signs of further deterioration or slumping at the crest of the dyke.

A shallow erosion gully was identified immediately adjacent to this area (plate 35).

It is likely that the instability identified in this area can be attributed to the work associated with breaching the dyke.

No other signs of instability, sloughing or erosion were noted on the remainder of the dyke.

As the dyke does not impound water, the instability adjacent to the breach is not considered to be a significant issue. The erosion gully should be monitored and if further erosion occurs, remediation should be undertaking with placing additional fill and reseeding.

5.0 Process Ponds

The three process ponds have been decommissioned and the liners removed. An overflow spillway has been constructed on the north side of the old pregnant pond which serves to provide a means of conveying excess runoff from the heap leach pad without damaging the integrity of the pond berm.

The pond berms were inspected and some minor settlement noted on the north berm of the old pregnant pond. The overflow spillway should reduce the potential for overtopping in this area but it is recommended that the berm be re-graded and compacted and all ponds monitored during spring freshet.

6.0 Recommendations and Conclusions

6.1 No evidence of significant failures of inspected civil works, waste rock dumps or drainage works was identified during the site visit.

6.2 Remediation efforts at reclaimed waste rock sites were observed to be successful with well established vegetation cover, stable slopes and minimal erosion.

6.3 Recommended site maintenance:

- Blue Pit Waste Rock Dump: Place additional riprap in drainage ditch adjacent to pit access road and erosion gullies. Additional seeding on lower portion of dump
- North Golden Pit Waste Rock dump: Place riprap in erosion gullies and reseed Northwest extremity of dump
- Place riprap in erosion gully adjacent to Leach Pad containment dyke breach
- Grade and compact north dyke at old pregnant pond

6.4 Recommended monitoring:

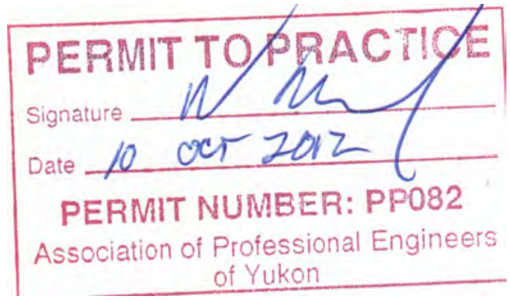
- Install monuments and survey Lucky Pit haul road side slope
- Undertake slope stability analysis of Lucky Pit haul road side slope especially if it is intended to use road for heavy mine haul
- Monitor process ponds during spring freshet to ensure no overtopping of berms
- Monitor breach and adjacent erosion gully in Heap Leach Pad containment dyke and undertake remedial works if required

7.0 Closure

If you should have any questions or require additional information on the above, please contact the undersigned directly at 867 334-5330.

Yours truly,

Vista Tek Ltd.



Victor Menkal, P.Eng.
Senior Engineer

Addendum A – Site Map


N
GOLDEN PREDATOR CORP
BREWERY CREEK MINE SITE PLAN
SEPT 2012 INSPECTION
NORTH GOLDEN
LUCKY
MOOSEHEAD
KOKANEE
HAUL ROAD
UPPER FOSTERS
SOUTH GOLDEN
LOWER FOSTERS
PACIFIC
CANADIAN
CAMP
BLUE
HEAP LEACH PAD
PROCESS PONDS
0
meters
1000
Vista Tek Ltd 3.10.12
Image Google Earth

Addendum B - Photo Journal

Plate 1: Haul Road Swale Discharge KP 0.6

Plate 2: Haul Road Swale KP 0.6

Plate 3: Haul Road Swale KP 1.2

Plate 4: Haul Road Swale Discharge KP 1.2

Plate 5: Haul Road Swale Discharge KP 1.5

Plate 6: Haul Road Swale KP 1.8 - Repaired Washout

Plate 7 Haul Road Swale KP 1.8 - Repaired Washout

Plate 8: Haul Road Swale KP 3.2 - Repaired Washout

Plate 9: Haul Road Drainage KP 4.5 From Upper Fosters (cross hairs)

Plate 10: Haul Road Drainage KP 4.5 150mm HDPE Pipe

Plate 11: Road Embankment at Lucky Haul Road

Plate 12: Road Embankment at Luck Haul Road

Plate 13: Lucky Haul Road Embankment

Plate 14: Embankment Stabilization Lucky Haul Road

Plate 15: Sinkhole Repair at Pacific Pit Overflow

Plate 16: Pacific Pit Overflow Drainage Channel

BREWERY CREEK ENGINEERING INSPECTION SEPT 19-20, 2012
ADDENDUM B - PHOTO LOG

Plate 17: Blue Pit Looking West from Canadian Pit

Plate 18: Erosion Channel Adjacent to Access Road at Blue Pit

Plate 19: Blue Pit Overflow Channel

Plate 20: Moosehead Pit

Plate 21: Moosehead Pit Overflow Channel

Plate 22: Lower Fosters and Canadian Pits

Plate 23: Kokanee Pit

Plate 24: North Golden Reclaimed Waste Dump

Plate 25: Erosion NW Corner North Golden Waste Dump

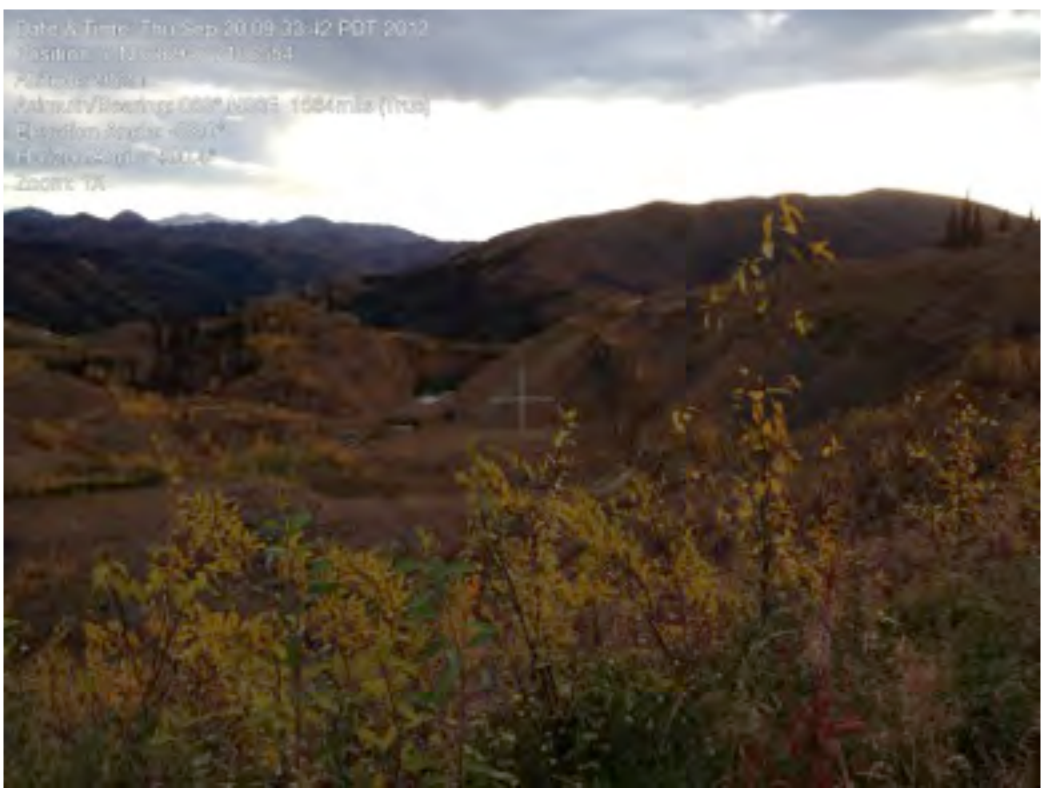


Plate 26: South Golden

Plate 27: Reclaimed Waste Rock Dump Lucky Pit

Plate 28: Lucky Pit

Plate 29: Lucky Pit Working Face

Plate 30: Bohemian Access Road Re-contoured Slump Area

Plate 31: Ore Pad & Heap Leach Site

Plate 32: Heap Leach Containment Dyke Looking Northwest

Plate 33: Heap Leach Pad and Containment Dyke Showing Revegetation

Plate 34: Breach in Heap Leach Containment Dyke above Pregnant Pond

Plate 35: Erosion Channel North of Containment Dyke Breach

Plate 36: Pregnant Pond Looking South

Plate 37: Barren Pond Showing Access Ramp

Yukon
Environment

Water Resources Branch (V-310)
Geotechnical Section
Box 2703, Whitehorse
Yukon Y1A 2C6

Tel: (867)-667-3104
Fax: (867)-667-3195

File Number: 9540- Brewery Creek

Inspection Report

Date of Report: **Oct 17, 2012**

Inspection Date: **Oct 11, 2012**

Licence Number: **QZ 11- 035**

Licensee: Golden Predator Canada Corp.

Location: Brewery Creek Mine near Dawson

Inspector: **Glenn Ford**

Accompanied By: **Katie Fraser, Environmental Officer, Golden Predator**

Inspector's Statement

On Oct 11, 2012 I visited the Brewery Creek mine site to conduct an annual geotechnical inspection. This site has been transferred to Golden Predator Canada Corp from Alexco. The water license is now in Golden Predator's name. I met briefly with the Chief Operating Officer Mr. Michael Maslowski to explain the nature of my visit. Mr. Maslowski gave me a copy of the recently completed geotechnical inspection done by Vista Tek Ltd. It was agreed that I would be escorted on site by Ms Katie Fraser, Environmental Officer for Golden Predator.

Background

The Brewery Creek mine was a heap leach gold mine operated from 1997 to 2001. Mining was done in a series of open pits. Reclamation activities have been underway for some years and were nearing completion. Golden Predator Canada Corp has recently purchased the property from Alexco and are drilling and assessing the site to potentially reopen the mine.
As part of this inspection I have reviewed the 2011 and 2012 geotechnical inspections done for the proponents.

Discussion

The following points were noted during my inspection

- The revegetation process seems to be doing quite well.

- The slump along the main haul road near the Lucky Pit does not appear to have changed.
- Haul road creek crossings in good condition
- Blue waste rock dump and ditch at base of dumps appear in same condition as past years. There was no water in the ditch at the base of the Blue waste rock dump
- Golden Predator staff have been driving to the base of the Blue waste rock dump to access some of their sampling sites. This has caused ruts to develop in the cover material. The ground was frozen during my visit but in spring these ruts could get worse and potentially uncover the waste rock. The condition of this driving path should be monitored and if necessary repairs should be made to the cover and a different method of accessing the sampling sites explored.
- I was unable to measure the water coming from the pipe at the base of the heap but by listening it was a very small amount (>1 litre per second).
- All of the ponds had been drawn down quite low.
- As per their water licence Golden Predator had recently been discharging from the south end of the process ponds using a gas powered pump. Water Resources Inspections had been advised of the discharge.
- A drum which was used to refuel the above mentioned pump was still in place beside the pond. Ms Fraser was informed that the drum should be moved and that in future refueling of equipment should not be done beside the ponds or any water course. She said she would have it removed.

Recommendations

The 2012 geotechnical inspection done by Vista Tek recommended a few maintenance items and some monitoring (see report on file "September 2012 Engineering Inspection – Brewery Creek Mine). These recommendations should be completed as well as

- Monitoring of the ruts recently made in the Blue waste rock dump cover.
- Removal of the fuel drum from beside the process pond and improving refueling procedures in future to eliminate spill potential.

I would like to thank the Golden Predator staff for their assistance in conducting this inspection.

____
Geotechnical Technician


Slump below haul road near Lucky Pit


Vehicle tracks on cover of Blue waste rock dump.


Fuel drum used for refueling pump at discharge site.

Yukon
Environment
Environnement
Water Resources Branch
Direction des ressources en eau

Water Use Inspection Report
Utilisation des eaux – Rapport d'inspection

(Pursuant to the *Waters Act* and *Waters Regulation*)
(En vertu de la Loi sur les eaux *et du* Règlement sur les eaux)

No. 2012-056

Page 1 / 2

Reference Number:
Numéro de référence : 9540-QZ

Licensee/ Person (full name and address) • *Titulaire du permis ou son représentant[1] (nom et adresse, au complet)*
Golden Predator Canada Corporation 11 Floor, 888 Dunsmuir Street, Vancouver, BC V6C 3K4

Person Contacted • *Personne contactée* — Accompanied By • *Accompagné par*

Ms. Jillian Chown & Mr. Randall Peterson, Representatives for Golden Predator, Brewery Creek Mine

Location • *Lieu*	Licence No. • *Permis n°*	Licence Expiry • *Date d'expiration du permis*	Date and Time • *Date et heure*
Brewery Creek	QZ96-007	December 31, 2021	July 4, 2012 010:00

Activity (circle one) • ***Activité*** *(encerclez un choix) :*
Industrial *Industrielle* | Quartz *Extraction du quartz* | Municipal *Municipale* | Power *Production d'électricité* | Miscellaneous *Diverse* | Agriculture *Agricole* | Conservation *Conservation* | Recreation *Récréative*

Conditions: A-Acceptable C-Concern U-Unacceptable NA-Not Applicable NI-Not Inspected
Conditions : *A-Acceptable C-À améliorer U-Inacceptable NA -Sans objet NI-Non inspecté*

Water Use *Utilisation des eaux*	Condition *Condition*	Comment *Commentaire*	Site Inspection *Inspection des lieux*	Condition *Condition*	Comment *Commentaire*	Site Inspection *Inspection des lieux*	Condition *Condition*	Comment *Commentaire*
Direct Use *Utilisation directe*	A		Site Stability *Stabilité du terrain*	NI		Bridges/Abutments *Ponts/culées*	NI	
Notifications *Avis*	NA		Slope Stability *Stabilité des talus*	NI		Fuel Storage/Spills *Entreposage de combustibles/ déversements*	NI	
Training (100 m³) *Correction (100 m³)*	NA		Site Drainage *Drainage du terrain*	NI		Reports *Rapports*	A	
Flood Control *Lutte contre l'inondation*	NA		Exacavated Material *Matériaux enlevés*	NI		Pipelines *Pipelines*	NI	
Diversions *Détournements*	NA		Re-Vegetation *Revégétalisation*	NI		Lagoons *Lagunes*	NI	
Ditches/Drains *Fossés/drains*	NI		Erosion Mats *Tapis anti-érosion*	NI		Deposit of Waste *Dépôt de déchets*	NI	
Weirs *Déversoirs*	NA		Silt Fencing *Clôtures anti-érosion*	NI				
Armouring (Rip Rap) *Enrochement*	NI		Sumps *Puisards*	NI				
Berms *Bermes*	NI		Channel Stability *Stabilité des canaux*	NI				
Dams *Barrages*	NI		Culverts *Buses*	NI				

* Denotes that comments are provided below • **L'astérisque renvoie aux commentaires ci-dessous.*

Enforcement Action (check one and see comments below) • *Mesure corrective (cocher une case – voir les commentaires ci-dessous)*

Written Warning *Avertissement écrit*	☐	Direction *Directive*	☐	Non-compliance *Non-conformité*	☐

Comments • *Commentaires*

On March 27, 2012 the Yukon Water Board granted an amendment to former Licensee, Alexco Resources Canada. The purpose of the amendment was to update Alexco's existing Care and Maintenance Water Licence QZ96-007 to reflect current site conditions. All clauses and appendices of water use licence QZ96-007 were withdrawn and replaced as per Amendment #8.

On April 23, 2012 Water Licence QZ96-007 was assigned to Golden Predator Canada Corporation from Alexco Resources together with all legal rights and obligations.

On July, 4, 2012 the undersigned Water Inspections Officer visited the Brewery Creek Mine Site. The purpose of the Inspection was to meet the new property owner Golden Predator and collect information respecting the company's intent to re-line the process ponds and discharge process water.

In preparation to install process pond liners, Golden Predator (GP) is presently pumping water from the Pregnant Pond to the Barren Pond which decants to the Overflow Pond. Upon water draw-down, GP indicated they will determine sediment depth, remove sediment from the Pregnant Pond and analyze the mineral content.

Licensee or Representative • *Titulaire du permis ou son représentant* Jillian Chown, Environment Permit Coordinator, Golden Predator

[signature] Matthew Jenner

Signature • *Signature* — Water Inspections Officer • *Agent d'inspection des eaux*

White Copy: Water Resources Branch, Yellow Copy: Licensee or Representative, Pink Copy: Yukon Water Board
Copie blanche : Direction des ressources en eau • Copie jaune : Titulaire du permis ou son représentant • Copie rose : Office des eaux du Yukon

YG5598)NC3 Rev.02/2012

[1]Dans le présent document, les expressions désignant des personnes visent à la fois les hommes et les femmes.

Yukon
Environment
Environnement
Water Resources Branch
Direction des ressources en eau

Water Use Inspection Report
Utilisation des eaux – Rapport d'inspection

(Pursuant to the *Waters Act* and *Waters Regulation*)
(En vertu de la Loi sur les eaux *et du* Règlement sur les eaux)

No. 2012-056

Page 2 / 2

Reference Number:
Numéro de référence : 9540-QZ

Licensee/Person • *Titulaire du permis ou son représentant[1] :* Golden Predator
Person Contacted • *Personne contactée :*
Accompanied By • *Accompagné par :* Jillian Chown, Golden Predator
Location • *Lieu :* Brewery Creek Mine Site
Corrective Action Date • *Date des mesures correctives :* None
Date and Time • *Date et heure :* None
Activity (circle one) • ***Activité** (encerclez un choix) :* Industrial *Industrielle* · Quartz *Extraction du quartz* · Municipal *Municipale* · Power *Production d'électricité* · Miscellaneous *Diverse* · Agriculture *Agricole* · Conservation *Conservation* · Recreation *Récréative*

As being the Water Inspector who has recently been on site, I have no issues with the relining of the process ponds under care and maintenance so long as GP provides updated drawings of the installed liner system, and addresses the existing Solution Management Plan to account for changes to the existing long-term passive water management program for treating low volume heap effluent solution.

Golden Predator is reminded that transferring pond water may stir metal constituents resulting in a geochemical disturbance to process water. As such, the Barren pond (biological treatment cell) overflows into the Overflow pond which infiltrates into the ground. The infiltrating water in the Overflow pond must also meet water license discharge criteria.

On June 14, 2012 Golden Predator collected grab samples from the three process ponds. The analytical water quality results @ the BTC show elevated Antimony (Sb51) 1380 ug/L, Selenium (Se34) 106 ugL, and Arsenic (As33) 225 ug/L. Also of note, the recently amended WQ Monitoring Schedule (2010-2014) includes the following ICP metals Ca, Mg, Na, K, Cu, As, Sb, Hg, Zn, Se, Pb, Al Bi, Cd, Cr, Fe, Mn, Mo, Ni, Ag and S.

When GP achieves compliant process water, including LC50 toxicity sampling, it is understood by the Inspector that a planned discharge from the Overflow Pond will occur this summer. The Inspector notes the Water Licence does contain other discharge conditions such as public notice requirements, maximum release volume for direct surface discharge @ 25,000m3 /year, daily flow rate, water quality monitoring requirement and upon discharge cessation the Licensee must submit a written report detailing the release of compliant effluent.

Historical Note

Last surface discharge occurred from May – June 2008. Total volume of treated process solution directly released into the Laura Creek watershed was 24,572 m3. No land application of solution occurred in 2008. Approximately 10,714 m3 of fresh water from the surface of the heap and surrounding catchment was released as it was captured in the Pregnant Pond.

Last Water Quality Audit (October 12, 2011) conducted by Water Resources Branch, Water Quality Unit is attached to this inspection report as a supplemental for your records.

The Inspector would like to thank the staff of Golden Predator for their hospitality and cooperation. I will be in contact with Golden Predator to schedule my next inspection in for July/August. In the interim, should the Licensee have any questions or concerns regarding this inspection report or wish to discuss the conditions and restrictions of the Water Licence please contact the undersigned Inspector by telephone 667-3147 or email matthew.jenner@gov.yk.ca

Licensee or Representative • *Titulaire du permis ou son représentant :* Jillian Chown, Environment Permit Coordinator, Golden Predator

Matthew Jenner

Signature • *Signature*

Matthew Jenner
Water Inspections Officer • *Agent d'inspection des eaux*

White Copy: Water Resources Branch, Yellow Copy: Licensee or Representative, Pink Copy: Yukon Water Board
Copie blanche : Direction des ressources en eau • Copie jaune : Titulaire du permis ou son représentant • Copie rose : Office des eaux du Yukon

YG5599)NC3 Rev.02/2012

[1]*Dans le présent document, les expressions désignant des personnes visent à la fois les hommes et les femmes.*

Appendix G- 2012 Annual Report LQ00364

Golden Predator Canada Corp.
1 Lindeman Road
Whitehorse, YT Y1A 5Z7
(867) 633-4653

December 5, 2012

Mining Land Use

Assessment Officer

Dawson Designated Office

PO Box 249

Dawson City, YT

Y0B 1G0

Attention: Mining Land use Officer

Re: Post Season Report / Class IV; Permit#: LQ00364

Date of Issuance: 2012/07/06 – Golden Predator Canada Corp.

YESAB File#: 2012-0091-044-1

Attn Mining land use officer

Attached please find our post season report for the 2012 exploration season. If you have any questions or require further information please contact myself directly via e-mail at tbourne@goldenpredator.com or via phone at (867) 335-7743.

Thank you.

Sincerely,

Tyler Bourne, Project Geologist / Golden Predator Canada Corp.

Brewery Creek

Post Season Report

Permit#:LQ00364

Summary of activities:

Corridors

No line cutting or corridor making of any kind was undertaken in 2012.

Trenching: Figure 1-1

A single trench was undertaken on claim LEE 34, grant number YB17701. The claim was 103m long, averaged 1.7m in depth, and was 1.2m wide, for a total volume of 210.12m^3 of material moved.

Clearings:

Though the majority of the 2012 drill program took place on historic roads, a number of pads were created on new roads in order to properly drill our targets. The claim numbers, names, associated grant numbers, numbered clearings and total surface area of each clearing lie in the tables below.

West Big Rock: Figure 2-1

Claim name	Claim number	Grant number	Clearings	Surface Area m^2	Reason
Eel	57	YB23911	2	640	Drill pads
Eel	55	YB23909	10	2987	Drill pads

East Big Rock: Figure 2-2

Claim name	Claim number	Grant number	Clearings	Surface Area m^2	Reason
Eel	53	YB23907	2	550	Drill pads
Eel	276	YB40247	6	1369	Drill pads

Moosehead: Figure 2-3

Claim name	Claim number	Grant number	Clearings	Surface Area m^2	Reason
Lee	29	YB04514	1	379	Drill pad

Ice Fog: Figure 2-4

Claim name	Claim number	Grant number	Clearings	Surface Area m^2	Reason
Lee	1	YB04486	3	1129	Drill pads

Bohemian/Schooner: Figure 2-5

Claim name	Claim number	Grant number	Clearings	Surface Area m^2	Reason
Flee F	96	YB40136	1	416	Drill pad
Flee	53	YB23976	4	1009	Drill pads
Flee F	95	YB40135	3	408	Drill pads
Flee	55	YB23977	7	1496	Drill pads

Canadian South: Figure 2-6

Claim name	Claim number	Grant number	Clearings	Surface Area m^2	Reason
Ele	2	YB23542	1	494	Drill pad

Classic: Figure 2-7

Claim name	Claim number	Grant number	Clearings	Surface Area m^2	Reason
Ele	54	YB23810	2	586	Drill pads
Ele	53	YB23809	4	977	Drill pads
Eel	171	YB39620	1	451	Drill pads
Eel	169	YB39618	1	465	Drill pads
Eel	162	YB39611	1	242	Drill pads

Lonestar: Figure 2-8, 2-9

Claim name	Claim number	Grant number	Clearings	Surface Area m^2	Reason
Eel	168	YB39617	6	1666	Drill pads
Eel	175	YB39624	3	787	Drill pads
Eel	173	YB39622	1	287	Drill pad
Eel	176	YB39625	1	268	Drill pad
Eel	183	YB39632	1	300	Drill pad

North West Classic: Figure 2-10

Claim name	Claim number	Grant number	Clearings	Surface Area m^2	Reason
Ele	75	YB23831	2	744	Drill pads

Access roads:

A number of access roads were added to the property. These additions can be seen in the previous figures (2-1 to 2-10) as red lines, generally extending off of previous roads. A total of 5310m of new access road were put in during the 2012 season. The table below delineates the length within each target area.

Zone	**Metres of access road**
West Big Rock	260
East Big Rock	230
Moosehead	80
Ice Fog	110
Bohemian/Schooner	450
South Canadian	120
Classic	1160
Lonestar	1400
North West Classic	1500
Total	5310m

Road Upgrades:

No road upgrades were undertaken in 2012, as the historic roads throughout the property were in good shape.

Trails:

No trails were used in 2012.

Off Road use:

No off road use was done in 2012.

Explosives:

No explosives were used in 2012.

Total disturbed area:

The total disturbed area is described in the above sections under clearings and roads.

Reclamation activities

Golden Predator commenced reclamation on its' North Slope zone. This consisted of pulling the earth and vegetative mat over old drill pads. Reclaimed pads are mapped in figure 3-1. Pictures of reclamation are attached at the end of this report (figure 3-2 to 3-17).

Hole ID	Pre reclamation	Post reclamation
RC11-2327	Figure 3-2	Figure 3-3
RC11-2331	Figure 3-4	Figure 3-5
RC11-2336	Figure 3-6	Figure 3-7
RC11-2337	Figure 3-8	Figure 3-9
RC11-2338	Figure 3-10	Figure 3-11
RC11-2330	Figure 3-12	Figure 3-13
RC11-2329	Figure 3-14	Figure 3-15
RC11-2328	Figure 3-16	Figure 3-17

Status of Camp

The camp at Brewery Creek is temporarily on care and maintenance for the winter break, and will likely be re-opened and fully operational sometime between February and March. During the care and maintenance period, a few staff members with Golden Predator and Chief Isaac

Status of Fuel Storage

Diesel on site is stored in 2 x 25 000L double walled envirotanks, and gasoline is stored in 2 x 4 700L envirotanks approximately 400m away from camp behind a fence of modular blocks (Jersey barrier).

4 6000L propane tanks are located behind modular blocks (Jersey barrier) behind the Travco trailers and administration buildings in order to service those buildings.

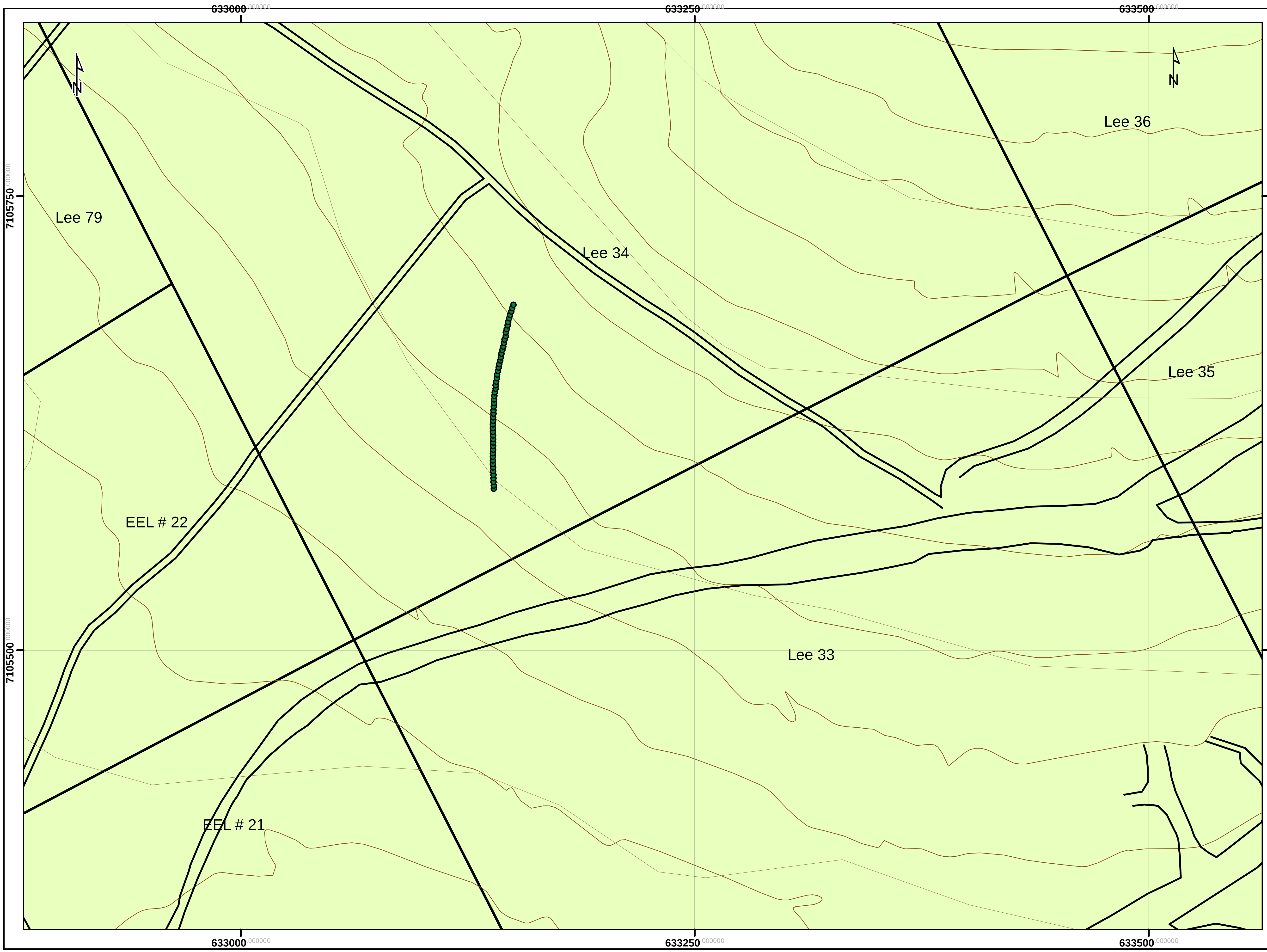
Part of the winter care and maintenance plan will be to supervise the condition and status of these fuel storage facilities.

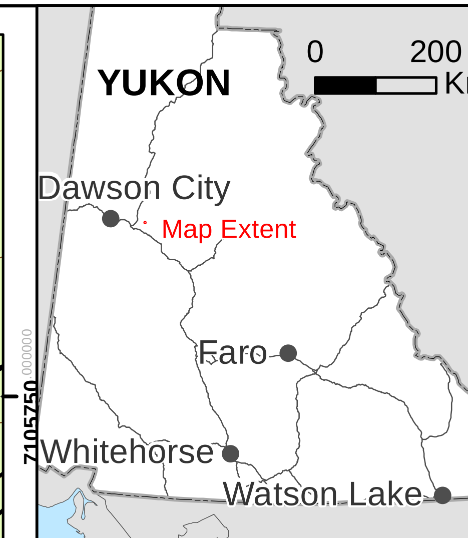
UTM Road coordinates

The table below delineates the start and end points of new access roads and trails put on the property.

Zone	Easting Start	Northing Start	Easting Finish	Northing Finish
West Big Rock	630913	7105694	630918	7105670
West Big Rock	630958	7105721	630995	7105673
West Big Rock	630988	7105820	630993	7105861
West Big Rock	631042	7105734	631049	7105731
West Big Rock	631069	7105716	631088	7105705
West Big Rock	631065	7105768	630194	7105754
West Big Rock	631117	7105731	631154	7105713
West Big Rock	631272	7105778	631261	7105772
East Big Rock	631703	7105871	631727	7105829
East Big Rock	631744	7105866	631752	7105855
East Big Rock	631783	7105939	631798	7105870
East Big Rock	631825	7105920	631853	7105899
East Big Rock	631834	7105925	631865	7105930
Moosehead	634225	7106585	634168	7106624
Ice Fog	636747	7106967	636705	7106868

Bohemian/Schooner	638786	7107225	638841	7107163
Bohemian/Schooner	638849	7107200	638874	7107174
Bohemian/Schooner	638823	7107244	638973	7107193
Bohemian/Schooner	638876	7107228	638886	7107210
Bohemian/Schooner	639124	7107110	639040	7107133
Classic/NW Classic	635847	7102851	635040	7103582
Classic	635489	7102849	635547	7102895
Classic	635720	7102812	635853	7102708
Classic	635874	7102850	635915	7102814
Classic	636230	7102827	636188	7102771
Classic	636329	7102218	636639	7102368
Lone Star	637055	7102328	637191	7102359
Lone Star	637112	7102231	637207	7102076
Lone Star	637137	7102283	637123	7102251
Lone Star	637124	7102237	637161	7102217
Lone Star	637236	7102214	637216	7102201
Lone Star	637847	7101923	637827	7101917
Lone Star	637874	7101908	637933	7101948
Lone Star	637900	7101934	637893	7101950
Lone Star	638226	7102159	638210	7102120
Lone Star	638263	7102001	638547	7102132
Lone Star	638275	7101909	638060	7101848
South Canadian	637953	7105717	638058	7105764





Legend

- Trench TR12-01

GOLDEN PREDATOR

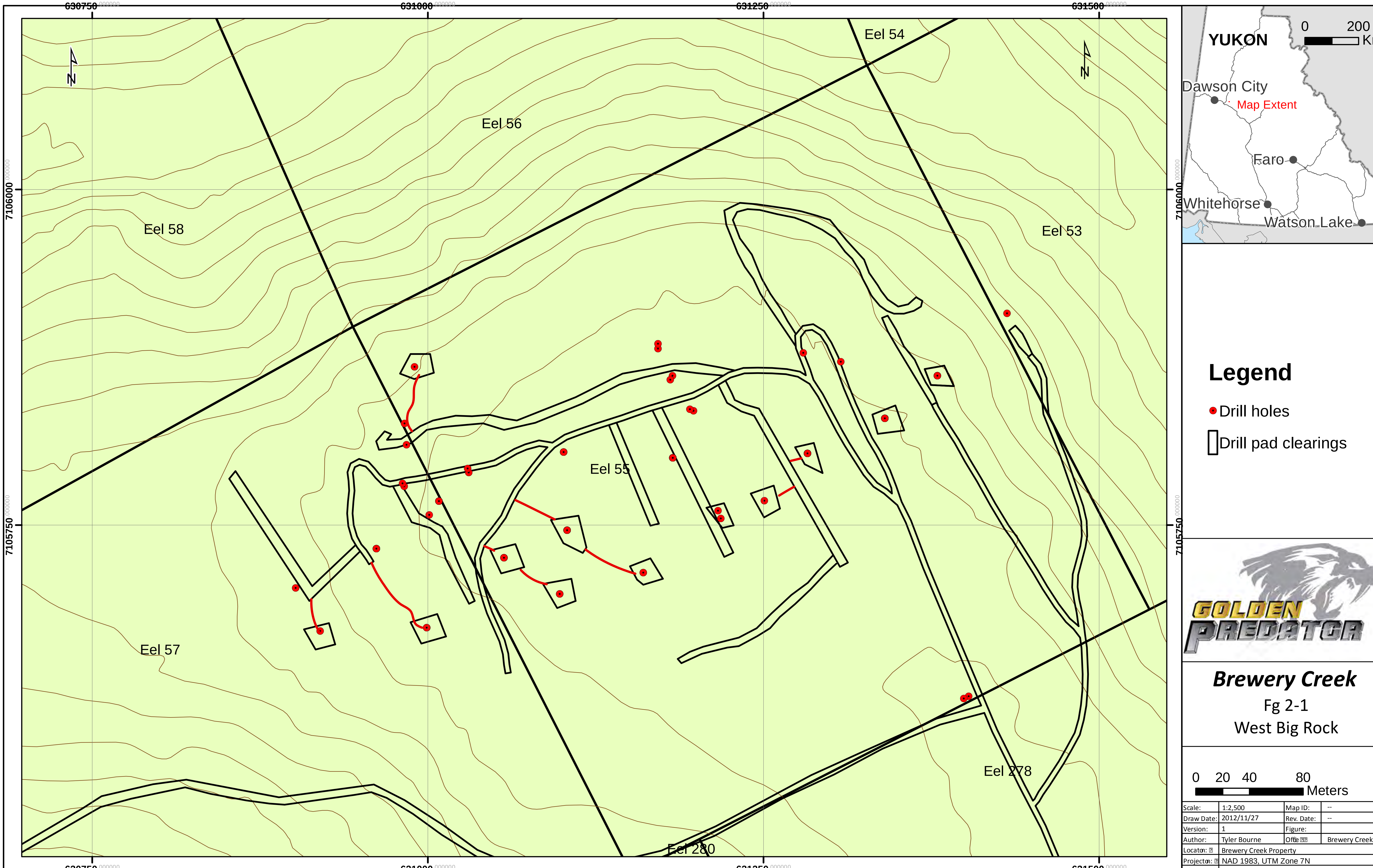
Brewery Creek

Fg 1-1

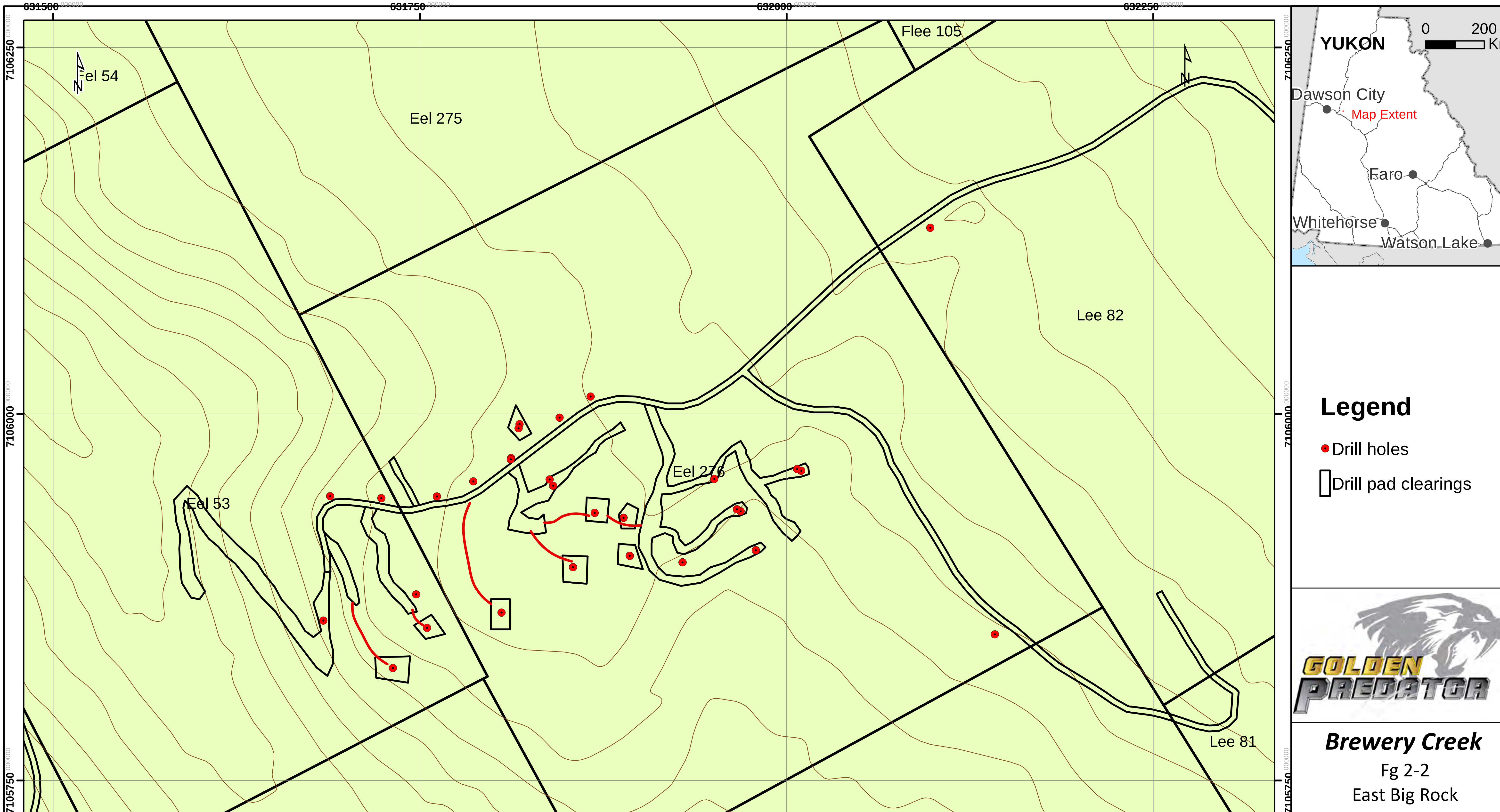
Trench

0 15 30 60 Meters

Scale:	1:2,000	Map ID:	--
Draw Date:	2012/11/27	Rev. Date:	--
Version:	1	Figure:	
Author:	Tyler Bourne	Office:	Brewery Creek
Location:	Brewery Creek Property		
Projection:	NAD 1983, UTM Zone 7N		
Filename:	Trench TR12-01		



630750
631000
631250
631500
7106000
7105750
Eel 54
Eel 56
Eel 58
Eel 53
Eel 55
Eel 57
Eel 278
Eel 280
N
YUKON
0 200 Km
Dawson City
Map Extent
Faro
Whitehorse
Watson Lake
Legend
Drill holes
Drill pad clearings
GOLDEN PREDATOR
Brewery Creek
Fg 2-1
West Big Rock
0 20 40 80 Meters
Scale: 1:2,500
Map ID: --
Draw Date: 2012/11/27
Rev. Date: --
Version: 1
Figure:
Author: Tyler Bourne
Offi e: Brewery Creek
Locaton: Brewery Creek Property
Projecton: NAD 1983, UTM Zone 7N
Filename: West Big Rock

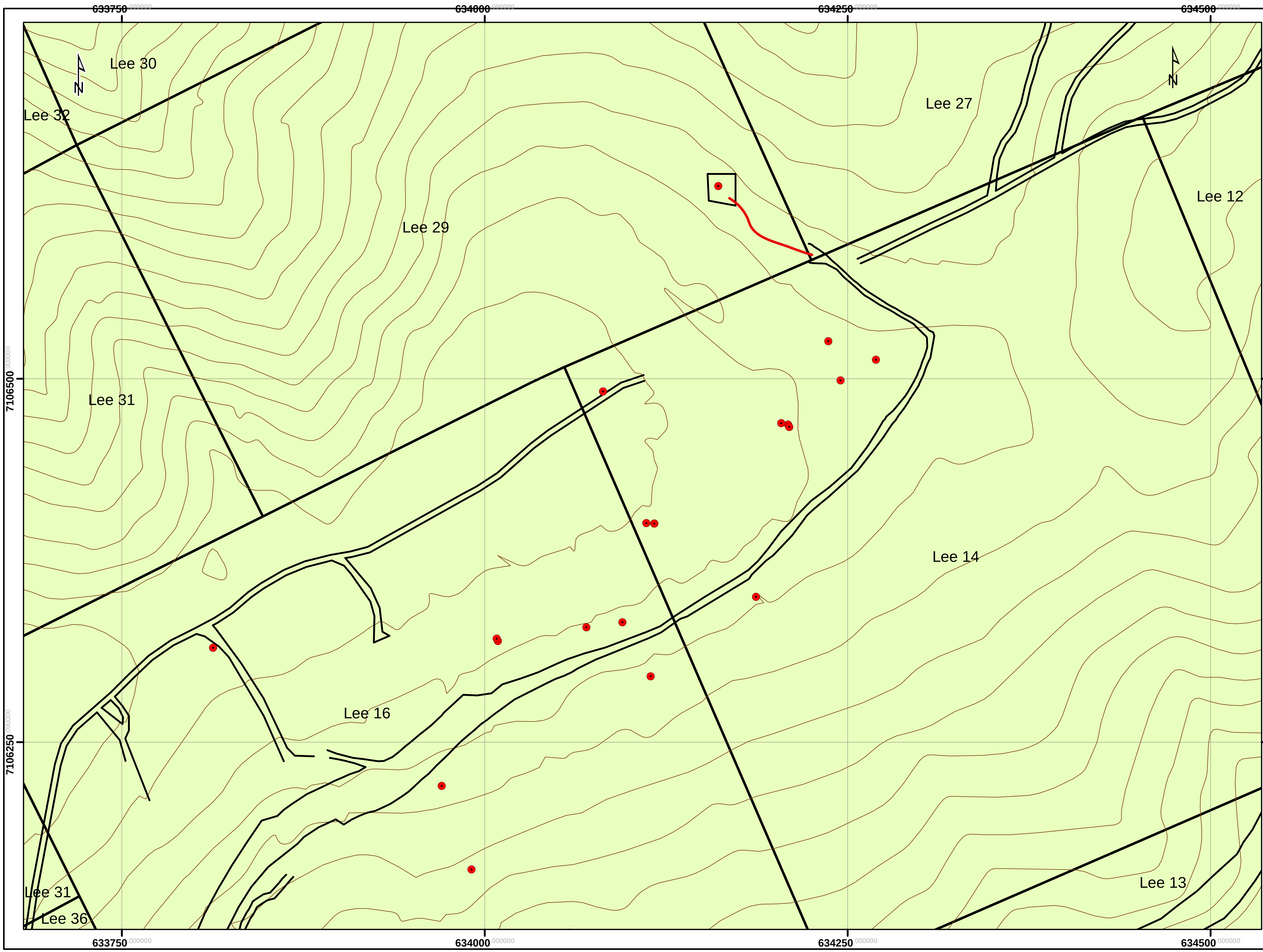


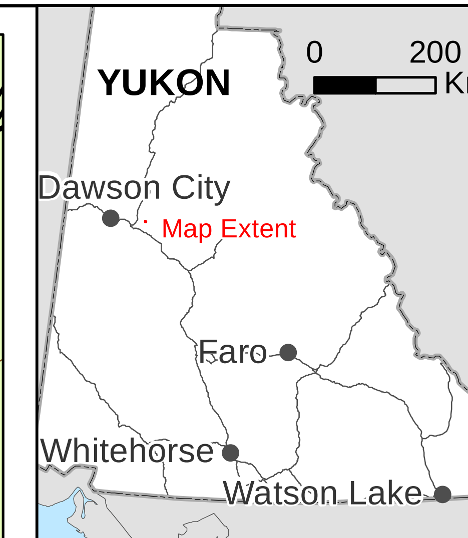
Brewery Creek

Fg 2-2

East Big Rock

Scale:	1:2,500	Map ID:	--
Draw Date:	2012/11/27	Rev. Date:	--
Version:	1	Figure:	
Author:	Tyler Bourne	Office:	Brewery Creek
Location:	Brewery Creek Property		
Projection:	NAD 1983, UTM Zone 7N		
Filename:	East Big Rock		





Legend

- Drill holes
- Drill pad clearings

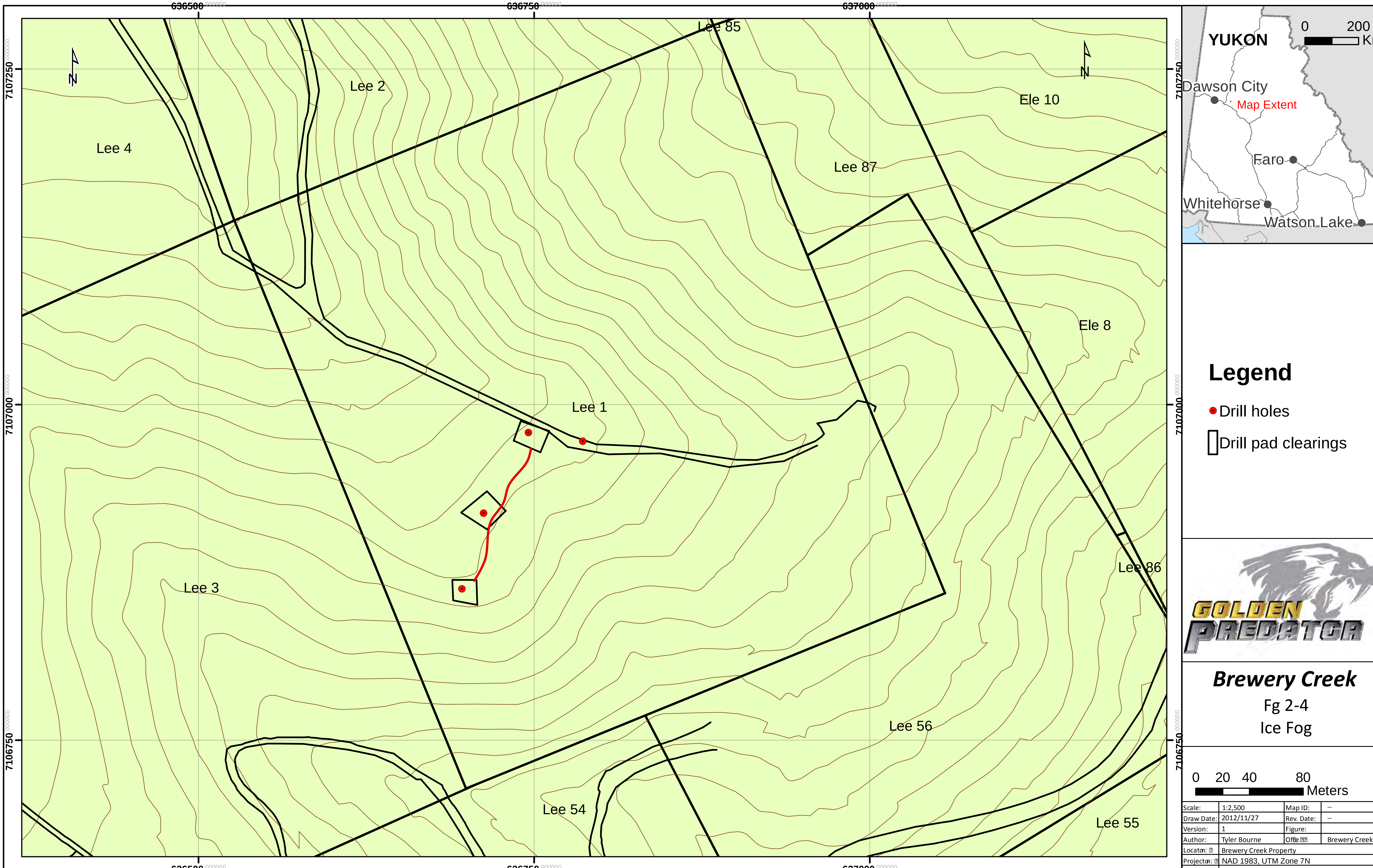
Brewery Creek

Fg 2-3

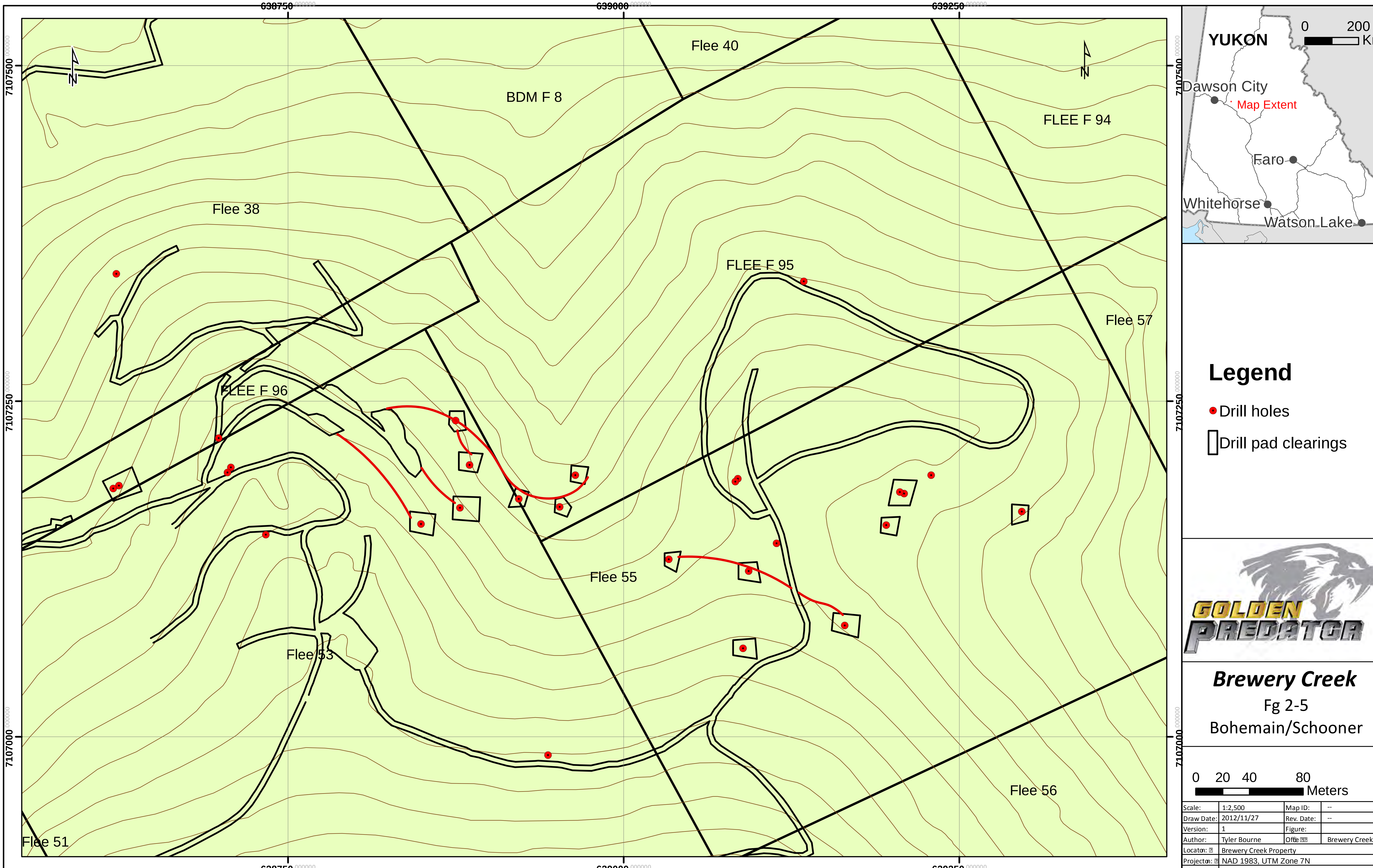
Moosehead

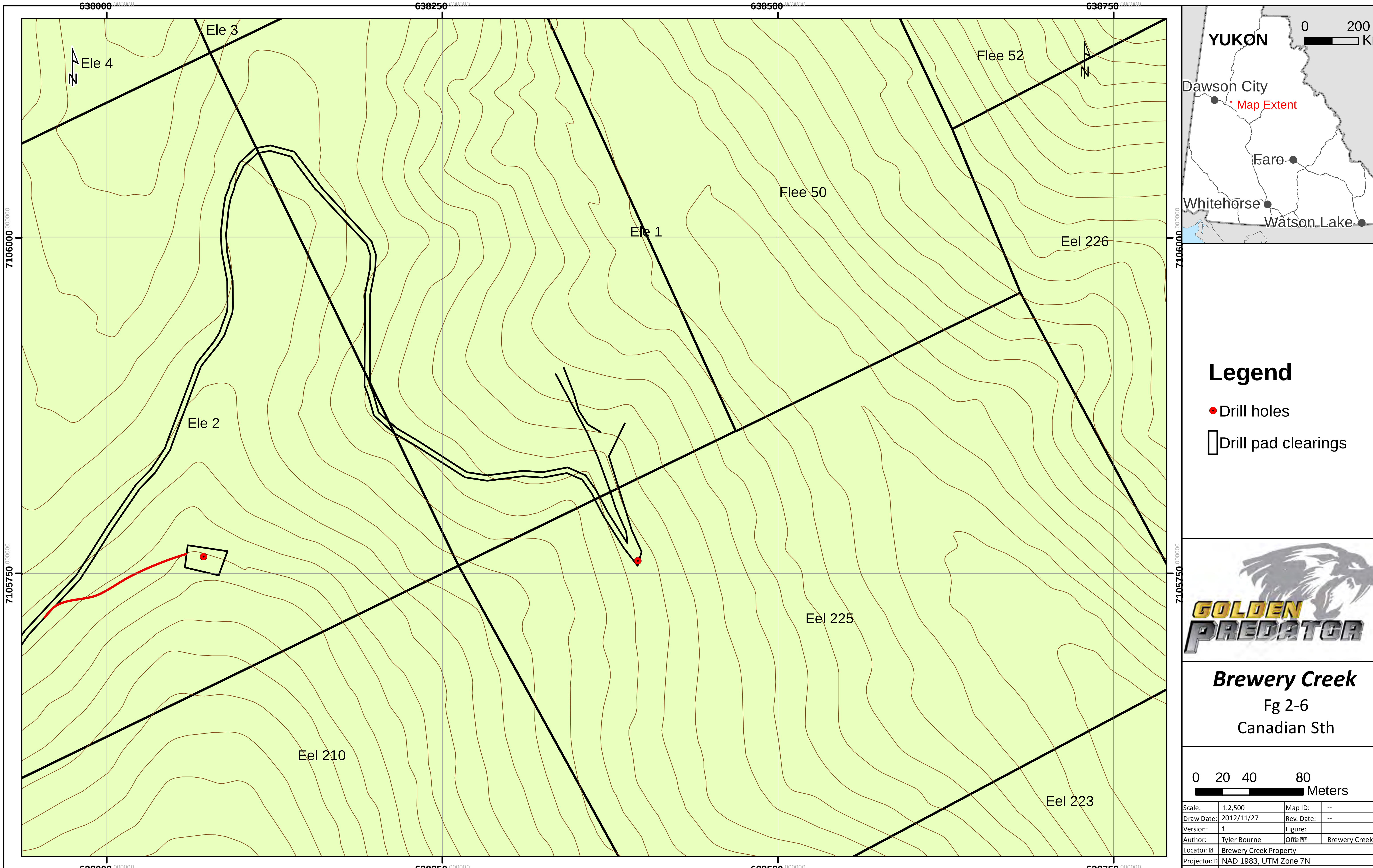
0 20 40 80 Meters

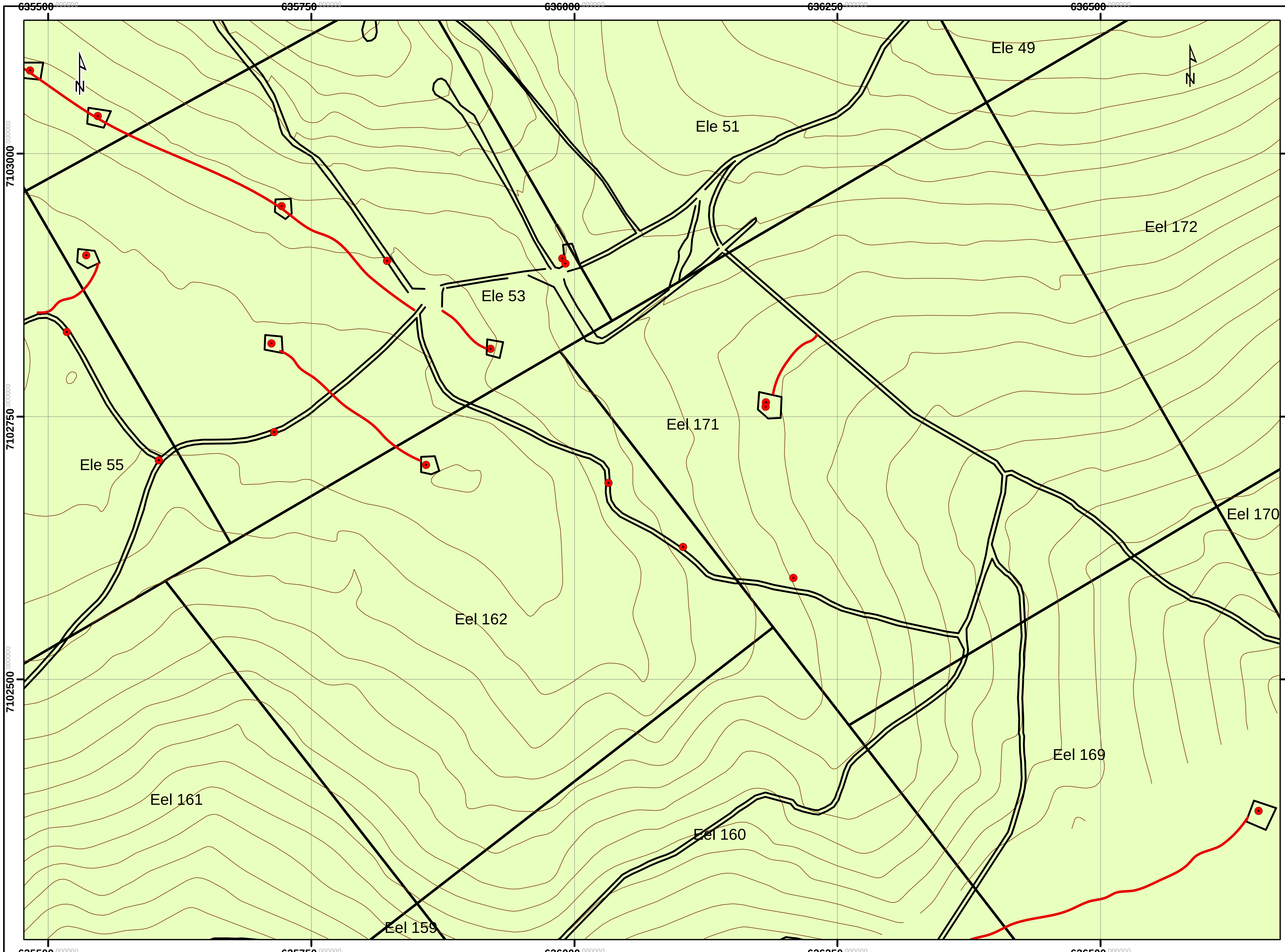
Scale:	1:2,500	Map ID:	--
Draw Date:	2012/11/27	Rev. Date:	--
Version:	1	Figure:	
Author:	Tyler Bourne	Office:	Brewery Creek
Location:	Brewery Creek Property		
Projection:	NAD 1983, UTM Zone 7N		
Filename:	Moosehead		

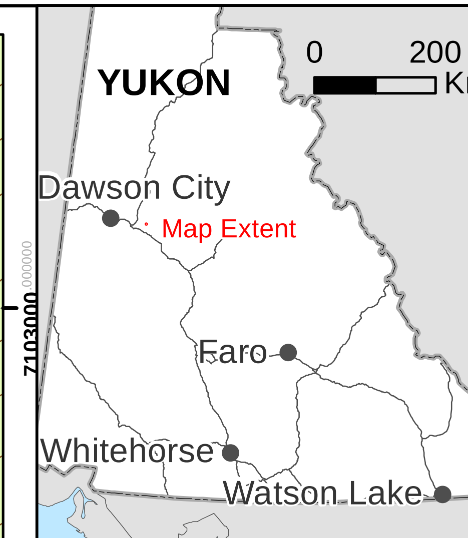


636500
636750
637000
7107250
7107000
7106750
Lee 85
Lee 2
Lee 4
Ele 10
Lee 87
Ele 8
Lee 1
Lee 3
Lee 86
Lee 56
Lee 54
Lee 55
N
YUKON
0 200 Km
Dawson City
Map Extent
Faro
Whitehorse
Watson Lake
Legend
Drill holes
Drill pad clearings
GOLDEN PREDATOR
Brewery Creek
Fg 2-4
Ice Fog
0 20 40 80 Meters
Scale: 1:2,500
Map ID: --
Draw Date: 2012/11/27
Rev. Date: --
Version: 1
Figure:
Author: Tyler Bourne
Office: Brewery Creek
Location: Brewery Creek Property
Projection: NAD 1983, UTM Zone 7N
Filename: Ice Fog


638750
639000
639250
7107500
7107250
7107000
N
Flee 40
BDM F 8
FLEE F 94
Flee 38
FLEE F 95
Flee 57
FLEE F 96
Flee 55
Flee 53
Flee 56
Flee 51
YUKON
0 200 Km
Dawson City
Map Extent
Faro
Whitehorse
Watson Lake
Legend
Drill holes
Drill pad clearings
GOLDEN PREDATOR
Brewery Creek
Fg 2-5
Bohemain/Schooner
0 20 40 80 Meters
Scale: 1:2,500
Map ID: --
Draw Date: 2012/11/27
Rev. Date: --
Version: 1
Figure:
Author: Tyler Bourne
Office: Brewery Creek
Location: Brewery Creek Property
Projection: NAD 1983, UTM Zone 7N
Filename: Bohemian/Schooner


638000
638250
638500
638750
7106000
7105750
Ele 3
Ele 4
Ele 1
Ele 2
Flee 52
Flee 50
Eel 226
Eel 225
Eel 210
Eel 223
YUKON
0 200 Km
Dawson City
Map Extent
Faro
Whitehorse
Watson Lake
Legend
Drill holes
Drill pad clearings
GOLDEN PREDATOR
Brewery Creek
Fg 2-6
Canadian Sth
0 20 40 80 Meters
Scale: 1:2,500
Map ID: --
Draw Date: 2012/11/27
Rev. Date: --
Version: 1
Figure:
Author: Tyler Bourne
Office: Brewery Creek
Location: Brewery Creek Property
Projection: NAD 1983, UTM Zone 7N
Filename: Canadian South





Legend

- Drill holes
- Drill pad clearings

GOLDEN PREDATOR

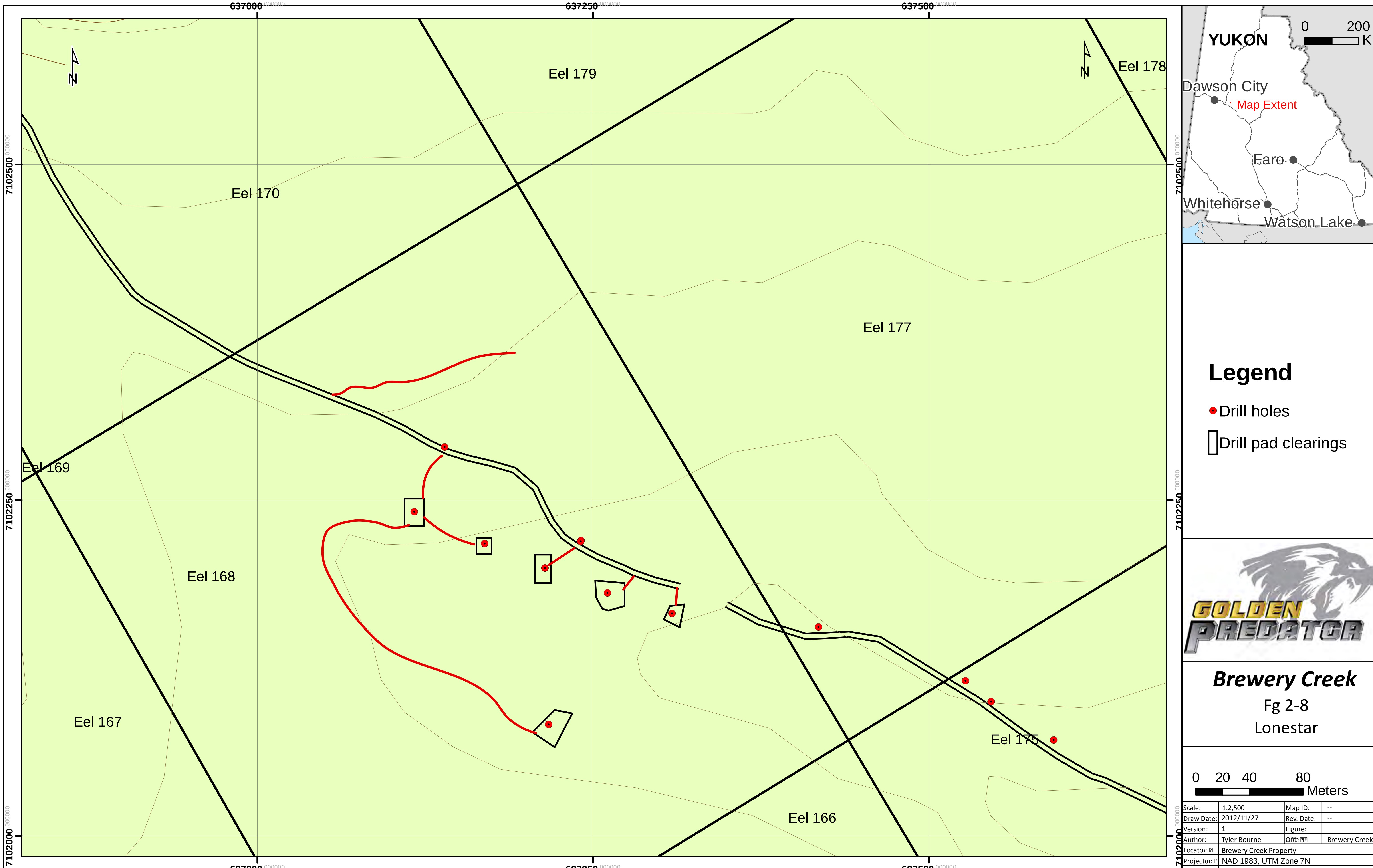
Brewery Creek

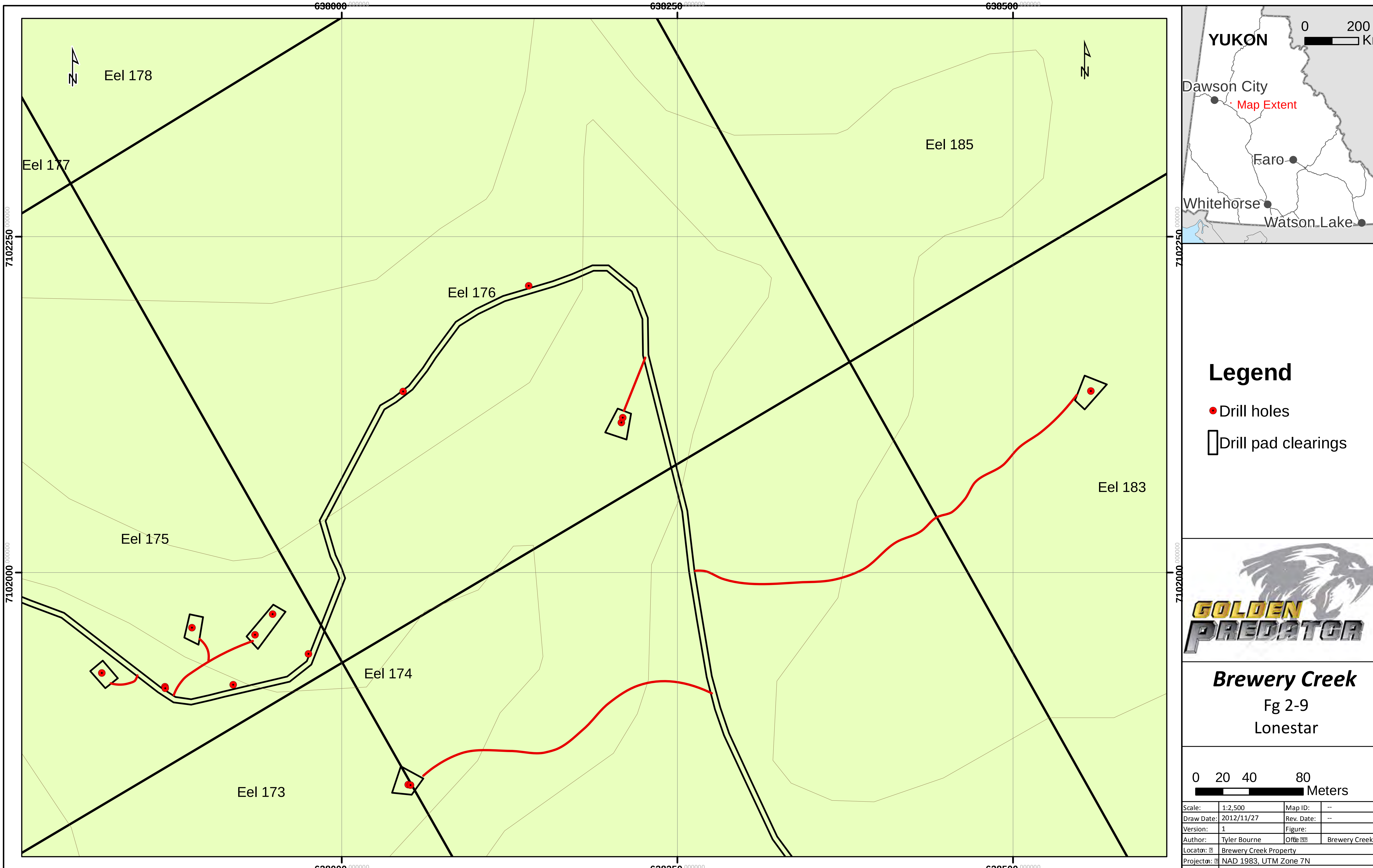
Fg 2-7

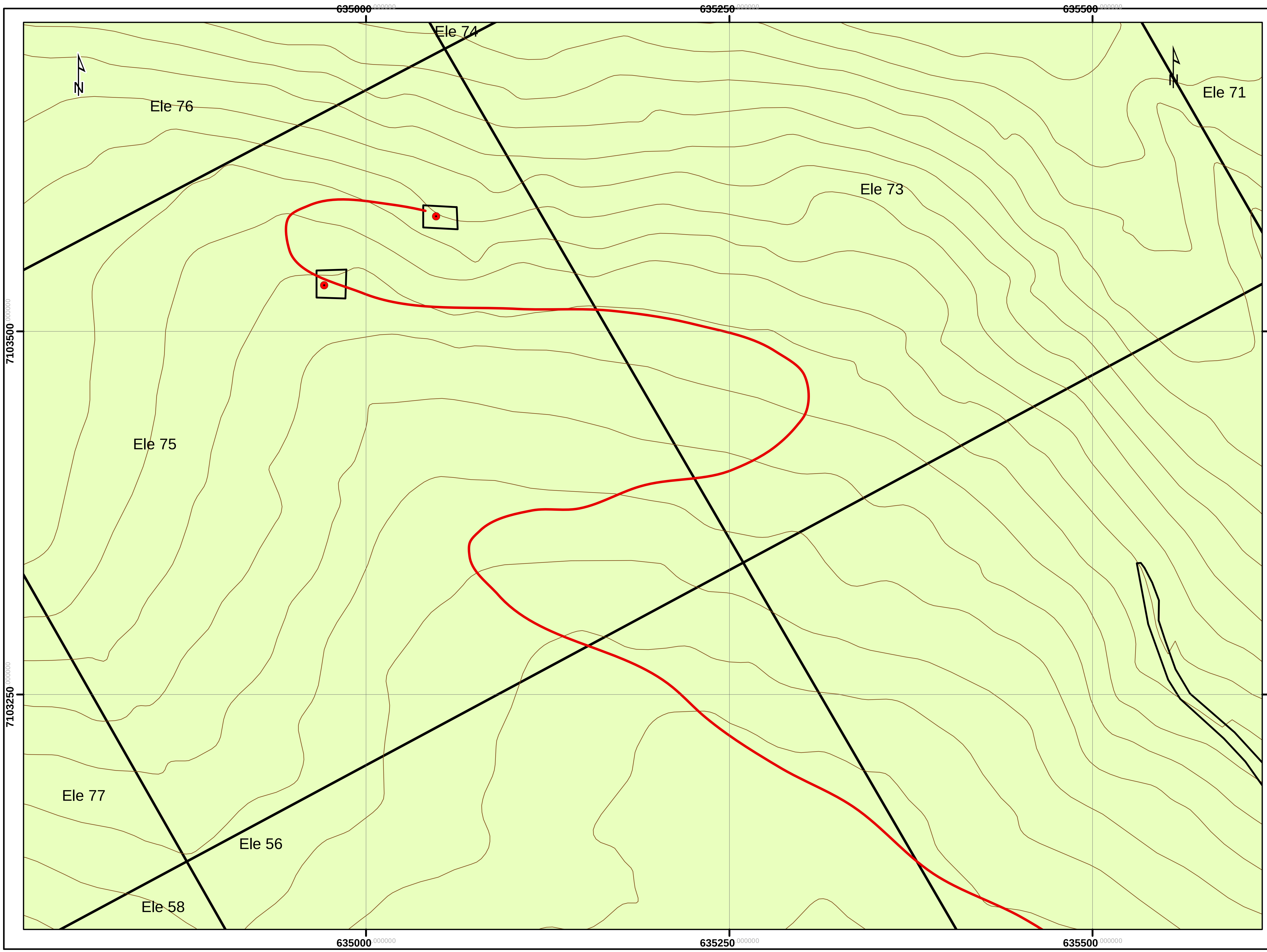
Classic

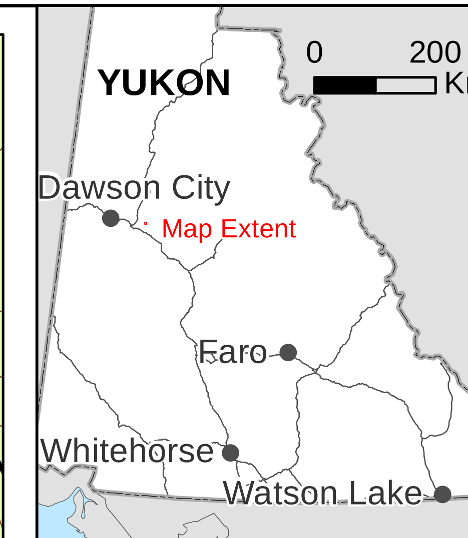
0 30 60 120 Meters

Scale:	1:3,500	Map ID:	--
Draw Date:	2012/11/27	Rev. Date:	--
Version:	1	Figure:	
Author:	Tyler Bourne	Office:	Brewery Creek
Location:	Brewery Creek Property		
Projection:	NAD 1983, UTM Zone 7N		
Filename:	Classic		


637000
637250
637500
7102500
7102250
7102000
Eel 179
Eel 178
Eel 170
Eel 177
Eel 169
Eel 168
Eel 167
Eel 175
Eel 166
YUKON
0 200 Km
Dawson City
Map Extent
Faro
Whitehorse
Watson Lake
Legend
Drill holes
Drill pad clearings
GOLDEN PREDATOR
Brewery Creek
Fg 2-8
Lonestar
0 20 40 80 Meters
Scale: 1:2,500
Map ID: --
Draw Date: 2012/11/27
Rev. Date: --
Version: 1
Figure:
Author: Tyler Bourne
Brewery Creek
Location: Brewery Creek Property
Projection: NAD 1983, UTM Zone 7N
Filename: Lonestar


638000
638250
638500
7102250
7102000
Eel 178
Eel 177
Eel 176
Eel 175
Eel 174
Eel 173
Eel 185
Eel 183
N
YUKON
0 200 Km
Dawson City
Map Extent
Faro
Whitehorse
Watson Lake
Legend
Drill holes
Drill pad clearings
GOLDEN PREDATOR
Brewery Creek
Fg 2-9
Lonestar
0 20 40 80 Meters
Scale: 1:2,500
Map ID: --
Draw Date: 2012/11/27
Rev. Date: --
Version: 1
Figure:
Author: Tyler Bourne
Office: Brewery Creek
Location: Brewery Creek Property
Projection: NAD 1983, UTM Zone 7N
Filename: Lonestar





Legend

- Drill holes
- Drill pad clearings

GOLDEN PREDATOR

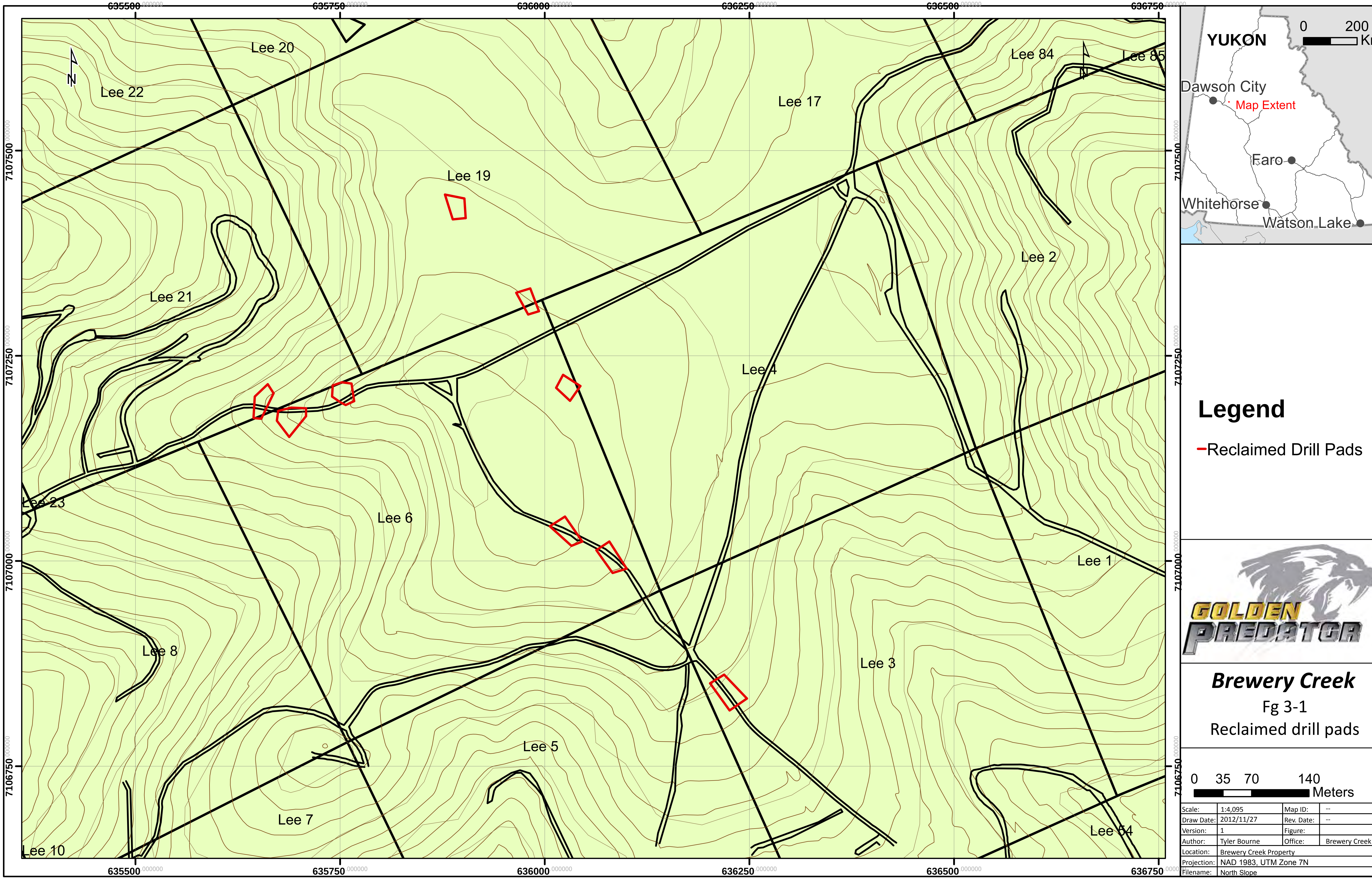
Brewery Creek

Fg 2-10

NW Classic

0 20 40 80 Meters

Scale:	1:2,500	Map ID:	--
Draw Date:	2012/11/27	Rev. Date:	--
Version:	1	Figure:	
Author:	Tyler Bourne	Office:	Brewery Creek
Location:	Brewery Creek Property		
Projection:	NAD 1983, UTM Zone 7N		
Filename:	Northwest Classic		



Scale:	1:4,095	Map ID:	--
Draw Date:	2012/11/27	Rev. Date:	--
Version:	1	Figure:	
Author:	Tyler Bourne	Office:	Brewery Creek
Location:	Brewery Creek Property		
Projection:	NAD 1983, UTM Zone 7N		
Filename:	North Slope		

Figure 3-2

Figure 3-3


Figure 3-4

Figure 3-5


Figure 3-6

Figure 3-7

Figure 3-8


Figure 3-9

Figure 3-10

Figure 3-11

Figure 3-12

Figure 3-13

Figure 3-14

Figure 3-15


Figure 3-16

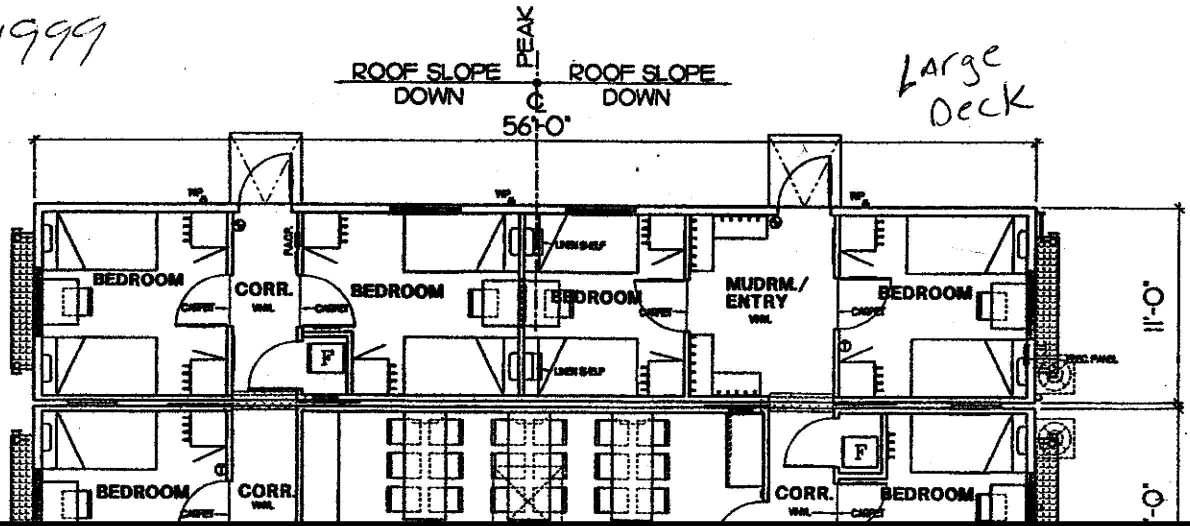
Figure 3-17

propane heat

66 x 56'

1999

Large Deck



Appendix H- Spill Reports

GOLDEN PREDATOR
YUKON'S GOLD COMPANY

Report all Spills of any kind in log book

Please report deisel and gasoline spills over 200L to Department of Environment

SPILL LINE → 867-667-7244

Spill Report

		Report #	1
		Date Reported: June 25/12	Date of Investigation: June 26/12
		Time Reported: 1000am.	Date Submitted: June 26/12.

LOCATION OF SPILL	Quantity of Spill
Brewery Warehouse Cement Pad	12 Lts oil

TYPE OF SPILL (Diesel/gasoline/oil/hydraulic fluid/other)

• Did not have the right part for the oil change, so used the funel it blew off the funel and oil spilled on the ~~pavement~~. cement pad. Approx 12L of motor oil

Employee: x Austin Taylor. June 26/12.

notes: Clean up completed.

PREVENTATIVE ACTION IMPLEMENTED OR TO BE IMPLEMENTED:	PERSON RESPONSIBLE	DATE TO BE COMPLETE	DATE COMPLETE
Order correct parts for ~~the~~ changing oil in loader.	Sam Wallingham		

GOLDEN PREDATOR — YUKON'S GOLD COMPANY

Report all Spills of any kind in log book

Please report deisel and gasoline spills over 200L to Department of Environment

SPILL LINE
867-667-7244

Spill Report

			Report #	
			Date Reported	Date of Investigation
			July 19 2012	July 18 2012.
LOCATION OF SPILL	Quantity of Spill		Time Reported	Date Submitted
Matrix Drill - W. Bigrock	less than 1L		11:30 a.m	July 19 2012.

TYPE OF SPILL (Diesel/gasoline/oil/hydraulic fluid/other)

Small amount of oil soaked gravel/soil/dirt falling from rig onto ground below. Only about a shovel full. soil/gravel was scooped up with shovel + placed in plastic container (bucket) it will be placed in GP waste container (grey c-can). soil ~~with~~ soil will be remediated in the bucket.

Employee: Jillian Chain

notes:

PREVENTATIVE ACTION IMPLEMENTED OR TO BE IMPLEMENTED:	PERSON RESPONSIBLE	DATE TO BE COMPLETE	DATE COMPLETE
Once soil in in bucket - aerate + turn soil - ~~and~~ soil with eventually be remediated over time.	Jillian	To be completed.	

Report all Spills of any kind in log book

Please report deisel and gasoline spills over 200L to Department of Environment

SPILL LINE
867-667-7244

Spill Report

		Report #	
		Date Reported: July 19 2012	Date of Investigation: July 19 2012
LOCATION OF SPILL: Parking area (front of office)	Quantity of Spill: less than 1L	Time Reported: 2:00 p.m.	Date Submitted: July 19 2012

TYPE OF SPILL (Diesel/gasoline/oil/hydraulic fluid/other)

gasoline -
- noticed a few small stains in the parking area - less than 2L total - most were dug up + placed in plastic bucket - soil (less than 5 Lg total soil volume) were placed on lined area near waste storage area near C-can.

Employee: Jillian Chown

notes: notice staining ; absorbent pads on dirt parking lot in front of main admin. building.

PREVENTATIVE ACTION IMPLEMENTED OR TO BE IMPLEMENTED:	PERSON RESPONSIBLE	DATE TO BE COMPLETE	DATE COMPLETE
dug up stained areas on lot put into plastic bucket - spread soil on the waste disposal storage area - C-can - this area is lined with impermeable liner - soil will be tilled to activate natural remediation -	Jillian / Kevin		July 19 2012

GOLDEN PREDATOR
YUKON'S GOLD COMPANY

Report all Spills of any kind in log book

Please report deisel and gasoline spills over 200L to Department of Environment

SPILL LINE
867-667-7244

Spill Report

Report #		
Date Reported: 23/07/12	Date of Investigation:	
Time Reported: 7pm	Date Submitted: 23/07/12	

LOCATION OF SPILL	Quantity of Spill
Kluane Drill BC12523	10L

TYPE OF SPILL (Diesel/gasoline/oil/hydraulic fluid/other)

hydraulic fluid
- main hydraulic line rotation fitting broke

Employee: Evan Grant

notes: cleaned entire spill with enviromat

PREVENTATIVE ACTION IMPLEMENTED OR TO BE IMPLEMENTED:	PERSON RESPONSIBLE	DATE TO BE COMPLETE	DATE COMPLETE