Environment | Water Resources Branch

Site Visit and Desktop Study Report

Brewery Creek Mine

Date of site visit: August 26-28, 2019

Licensee: Golden Predator Canada Corp

Water licences: QZ96-007 expires Dec. 31, 2021 and MN12-038 expired July 5, 2022

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Report date: June 2020

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Distribution list: Government of Yukon: EMR-CMI, ENV-EA; Golden Predator; Tr'ondëk Hwëch'in Government

The Water Resource Branch (WRB) is responsible for monitoring surface and groundwater in Yukon and is committed to responsible management, protection and conservation of the territory's water resources. As technical experts in water resources, we provide advice for compliance and inspections purposes and conduct reviews of projects undergoing water licensing and environmental assessment processes.

One of WRB's responsibilities is to conduct site visits of various undertakings that use or deposit waste to water. Site visits are undertaken to improve understanding of a project's effects on the receiving water environment, with the intention of identifying emerging issues and enhancing understanding of existing water quality and quantity conditions to support technical advice and input into assessment, licensing, and post-licensing processes. While WRB provides support to inspectors on enforcement and compliance matters related to water licences, it is not WRB's role to enforce compliance. The opinions and recommendations expressed in this report are based on relevant data, reports, interpretation/analyses of scientific information available to WRB, and what was observed in the field.

Key Findings

Review of Effluent Quality Standards and Water Quality Objectives

- Samples collected during the August 2019 visit are compliant with Effluent Quality Standards and Water Quality Objectives

Heap water quality

- Total cyanide concentrations in heap water (BC-28a) are low and continues to decline since the commencement of detoxification of the heap in 2002
- Nitrate concentrations are high and variable in heap water (BC-28a). High nitrate concentrations are presumed to be caused by the degradation of cyanide to nitrate during detoxification and are expected to remain high in the near future
- Sulphate and antimony concentrations in heap water (BC-28a) have increased since around 2006. The increases are presumed to be caused by oxidation of the ore and neutral mine drainage in the heap

Water quality observations in downgradient receiving water

- Concentrations of nitrate are recently elevated above protection of aquatic life guidelines in downgradient surface water Carolyn Creek
- Concentrations of nitrate and sulphate are increasing in groundwater downgradient of the heap
- WRB hypothesizes that changes in water quality in groundwater and surface water downgradient of the heap in the last decade are attributed to infiltration of heap water to ground due to pond liner removal and the approved heap dyke breach
- Although the discharge of heap effluent to the Land Application Area (LAA) in 2002-2004 was compliant with licence conditions; WRB contends this caused an increase in concentrations of nitrate, cyanide, and selenium in downgradient groundwater and surface water. It is believed that the effects of the discharge of heap effluent to the LAA on receiving waters had largely diminished by 2009.

Recommendations

The following technical recommendations are for consideration by Golden Predator and are based on our current understanding of the site. Rationale for these recommendations are presented at the end of this report.

1. Golden Predator should conduct a comprehensive geochemical and water quality assessment for the Brewery Creek mine.
2. Although Golden Predator is licensed to discharge to the LAA, we recommend Golden Predator undertake further studies on attenuation capacity and potential impacts to downgradient receiving water should Golden Predator want to use the LAA for effluent discharge. Alternative treatment options should also be considered for any future discharges.

3. Golden Predator should review and potentially revise currently licenced Effluent Quality Standards (EQSs) and Water Quality Objectives (WQOs) in consideration of receiving environment water quality findings contained herein. WQOs and EQSs should be derived for nitrate and sulphate and potentially other parameters.
4. Golden Predator should update the Adaptive Management Plan under the current license to include increased clarity and detail on triggers and actions.
5. Golden Predator should evaluate the efficacy of existing surface and groundwater monitoring station locations and potential siting of new stations surrounding the heap leach facility.
6. Golden Predator should continue a monthly and quarterly frequency of monitoring for surface water and groundwater quality, respectively, to support comprehensive understanding of water quality conditions on site. Groundwater levels should be monitored continuously using data loggers and atmospheric pressure should be monitored at the same measurement interval such that water level measurements can be accurately barometrically compensated. Additionally, to understand the natural variability during times of high variability (i.e. spring freshet), it is recommended to also conduct 5 sampling events in 30 days.
7. Un-ionized ammonia should be added to the monitoring/reporting schedule for currently monitored water quality stations.
8. Golden Predator should prepare contour maps of the potentiometric groundwater surface and infer general groundwater flow directions for (a) the period during which heap effluent was discharged to the LAA (2002-2004), and (b) current conditions.
9. Golden Predator should inspect and repair groundwater wells and staff gauges with deficiencies to enable monitoring as required under water licence QZ96-007.
10. Nested groundwater monitoring well samples should be reported such that shallow or deep samples are indicated in the station ID.
11. Golden Predator should locate, compile, and share well records (geologic logs and installation as-built drawings) for all groundwater monitoring wells on site.

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Introduction

Government of Yukon, Department of Environment, Water Resources Branch (WRB) conducted a site visit to Brewery Creek mine (Figure 1) from August 26-28, 2019. The purpose of the visit was to become familiar with the mine components and collect water quality samples to ascertain current conditions on site and any implications for future mining.

In addition to samples collected from the August 2019 visit, this report examines past data to understand the potential influence of key features of the heap leach area on the receiving environment over time. This analysis is based on a water quality dataset held by WRB, which includes data submitted under past licensing, sampling conducted directly by YG, and other results shared with WRB.

As a result of data analysis, the scope of the work evolved to further examine patterns of interest in the data. The objectives of this report are a reflection of that evolution, and vary slightly from the originally envisioned objectives:

1. Review of Effluent Quality Standards and Water Quality Objectives in Water Licence QZ96-007.
2. Characterize and understand the quality of water in the heap.
3. Assess potential impacts of mining activity in the leach pad area on the surface water receiving environment.
4. Assess potential impacts of mining activity in the leach pad area on groundwater.
5. Identify considerations for potential future mining to ensure protection of the receiving environment.

Background

Timeline

1996-2001: Production

The Brewery Creek gold mine operated seasonally, from April to October, between 1996 and 2001 by Viceroy Minerals Corporation under Water Licence QZ96-007 and Quartz Mining Licence A99-001. The mining property comprised eight separate open pits, associated waste rock piles and a heap leach facility (Figure 1).

During production, Viceroy stacked run of mine ore on the heap pad and applied a cyanide solution to leach the gold. The pregnant (gold bearing) solution was collected by a network of pipes on the primary liner of the pad and collected and processed at the Adsorption-Desorption-Recovery (ADR) plant to recover the gold. The 'barren' (no gold) solution was then recirculated to the pad.

2001: Mining and gold leaching operations ceased

2002: Heap Detoxification

Heap detoxification was conducted by an in-situ biological process, which involved a supply of nutrients (carbon and phosphorus) to promote the reduction of cyanide and metal-cyanide compounds through bacterially-induced reduction processes (Viceroy Minerals Corporation 2003b). Note that whereas heap detoxification activities occurred in 2002, the water licence defined the heap "officially detoxified" five years later, based on continuous low concentrations of cyanide in water from the heap.

2002-2008: Effluent Discharge

The heap was drained down in 2003, and water was circulated through a Biological Treatment Cell (BTC) to further remove some contaminants. Effluent was discharged onto the LAA sporadically from 2002 to 2004 and directly to Laura Creek sporadically from 2004 to 2008. The LAA was used as an additional mechanism to treat effluent through natural soil attenuation of metals and nutrients.

2003: Heap Leach Re-grading and Cover

By the end of 2003, the heap was re-graded and covered with about 25cm of soil and seeded with a mix of grass. The cover reduces the infiltration rate of meteoric water passing through spent ore.

2003: Blue Waste Rock Cover

The Blue waste rock storage area was identified as a potentially acid generating source; therefore, in 2003 a cover was placed on top of the waste rock pile to reduce infiltration through the pile. A lysimeter was installed on top of the blue waste rock storage area to test the effectiveness of the cover.

2004: Forest Fire

A forest fire burned approximately 17,000 hectares south of the mine towards the South Klondike River and west of the mine towards the North Klondike River (Figure 2).

2005: Water Licence was assigned to Alexco Resources Corp.

Licence was also amended (Amendment #7, Application QZ03-062) to enable closure activities.

2008: Pond Liner Removal

Yukon Government required removal of liner from the 3 ponds at the base of the heap to address wildlife concerns (Alexco 2009). This allows water to infiltrate into the ground from these ponds, and since this time, no surface or LAA discharge has occurred. There are conflicting accounts on the extent to which liners were removed from the ponds. An Alexco report describes, and shows photographs of ponds that have had their entire liner removed (Alexco 2010a); however, personal communication with Golden Predator

staff has indicated that liner was removed from the upper 1/3 of each pond (Golden Predator, 2020).

2009: Leach Pad Dyke Breach

The leach pad dyke at the corner of cell one was breached, as per existing plans, in order to prevent the buildup of water behind the dyke (Alexco 2010b).

2012: The water licence was assigned to Golden Predator Canada Corp.

The current water licence is set to expire December 31, 2021.

2019: Heap Leach Cover Removal

From August-September 2019, Golden Predator began clearing the undeveloped cells of the heap leach facility (cells 8-10) (Golden Predator, 2020b), followed by stripping of the cover of cells 1-7 in anticipation of potential re-processing of heap ore (Figure 2).

Key Features in the Heap Leach Area

Since the objective of this work is to understand the potential impact of the heap to water in the receiving environment, the key mine features in this area are described below.

Heap Leach Facility

The existing heap leach pad extends from cells 1-7 with a surface area of 311,000 m^2 and 9.5 million tons of ore. Three additional cells (8-10) on the north end of the facility were permitted but never developed (Figure 1).

The heap leach pad liner system was constructed in several layers to provide for containment of solution, leak detection and collection. The original design of the leach pad liner system was changed in 1999 and replaced the top silt and PVC liner with a composite geosynthetic clay liner. From the top down, the original liner system comprised a 0.6-1.0m layer of ore cushion to protect the primary liner, a composite liner of 1mm PVC geomembrane over 0.3m of compacted silt, a geotextile filter and separation layer, a leak detection and recovery system (LDRS) of 0.3 m of gravel, and a secondary composite liner of 0.75mm PVC over 0.3m of compacted silt. The LDRS is a network of perforated, corrugated high density polyethylene pipes surrounded by gravel to collect any leakage through the primary liner. This solution was directed by gravity to monitoring and collection points and then to the ADR plant for introduction back into the process stream (Viceroy Minerals Corporation 2000).

The heap leach is currently a free-draining system. Water drains from the heap to the sediment settling pond (aka pregnant pond) via the breach in the leach pad dyke in the southwest corner of the facility. Additionally, there is potential for heap water to infiltrate to the environment from

the perimeter of the pad as a result of remediation activities which regraded material to outside the pad footprint (Golden Predator, 2020).

Water from the sediment settling pond (aka pregnant pond) flows into the biological treatment cell (aka barren pond), which then flows into the overflow pond. Water from all three ponds has been able to infiltrate into the ground since the pond liners were removed in 2008. No surface discharge or application to the LAA has occurred since this time. The total storage capacity of the three ponds is 154,600 m^3.

Prior to liner removal, the pregnant and barren ponds were double-lined with a 2.0 mm thick HDPE primary liner and a 1.0 mm thick underlying secondary HDPE liner. The overflow pond was single-lined with 2.0 mm thick HDPE. In addition to the HDPE liner, each pond has a compacted silt layer at least 150 mm thick between the HDPE and the subgrade forming a bedding layer to prevent rock projections from impacting the liner (Viceroy Minerals Corporation 2000). Additionally, the barren and pregnant ponds each had a leak detection and recovery system (LDRS) in the form of a high transmissivity geonet drain between the two HDPE liners.

Land Application Area

At closure, the intent of the LAA was to disperse effluent from the process ponds and/or overflow pond after detoxification of the heap onto this area for further treatment to reduce the concentrations of certain parameters in heap effluent if necessary. The land application area is meant to support natural attenuation of certain metals and nutrients by having effluent flow through the active soil layer where various microbial and chemical mechanisms are able to sequester metals/metalloids and nutrients. The LAA is adjacent to the ponds and heap pad on a gently sloping, south facing hillside (Figure 2). Surface topography in the application area shows that surface runoff will travel southwesterly, into Carolyn Creek, and then downstream to the confluence with Laura Creek (Viceroy Minerals Corporation 2001). Clause 66 in water licence QZ96-007 states that effluent may be discharged up to 400,000m^3 during the term of the licence.

In May and June of 2002, twenty-two lysimeters of varying depths were installed within the LAA and two nested monitoring wells (BC-65 and BC-66; see Figures 2 and 16) were installed adjacent to the LAA near the southern boundary (Viceroy Minerals Corporation 2002b). WRB has records of lysimeter water quality for 2002 and 2003. In addition, seepage at the toe of the LAA was observed and sampled during active solution release in 2002 and 2003 (Viceroy Minerals Corporation 2003a and 2004a).

Sewage Treatment System

Golden Predator currently holds a Type B water licence (MN12-038) to obtain groundwater and upgrade an existing septic system for camp use. The licence authorizes Golden Predator to, among other things, obtain a maximum quantity of 50 m^3/d of water for camp use and fire

suppression purposes and discharge camp sewage and greywater to ground via the septic system. The system is currently authorized to accommodate a maximum 120 persons. Figure 2 shows the location of the currently used absorption field associated with the system, based on Figure 1 of Exhibit 1.7 of the water licence application.

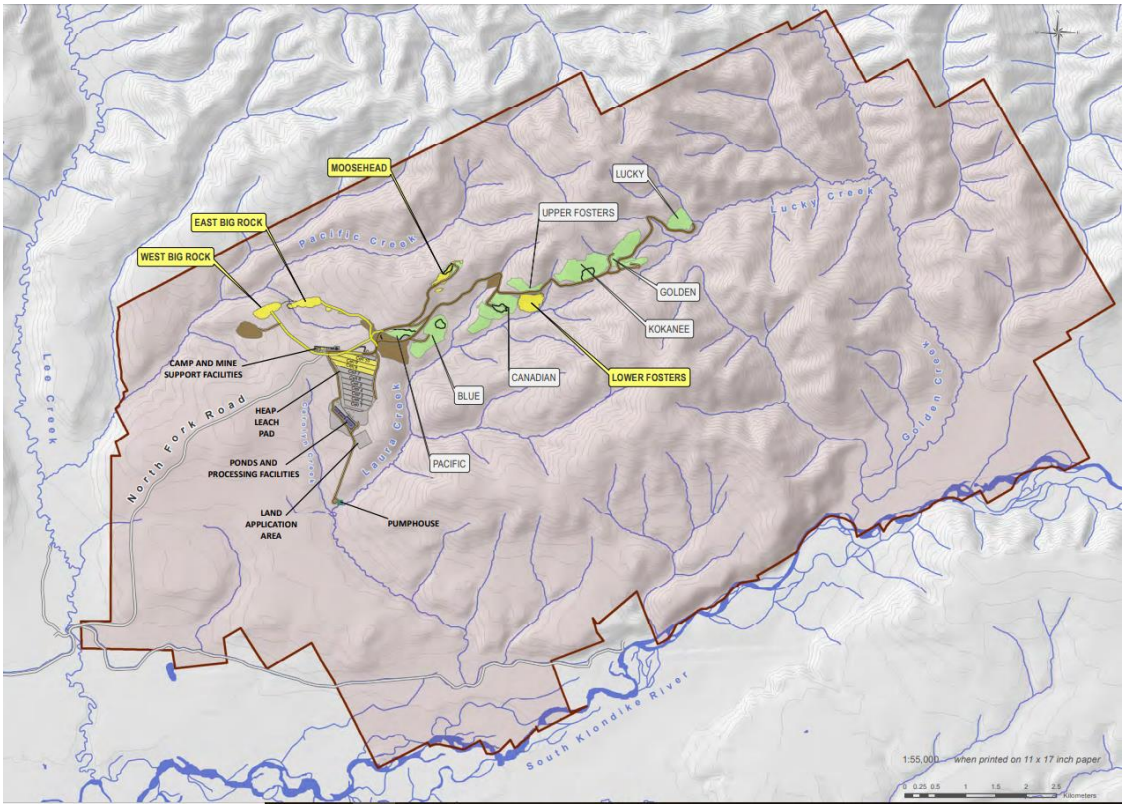

Figure 1: Map of the Brewery Creek mine property. Yellow locations were never developed (Golden Predator 2013).

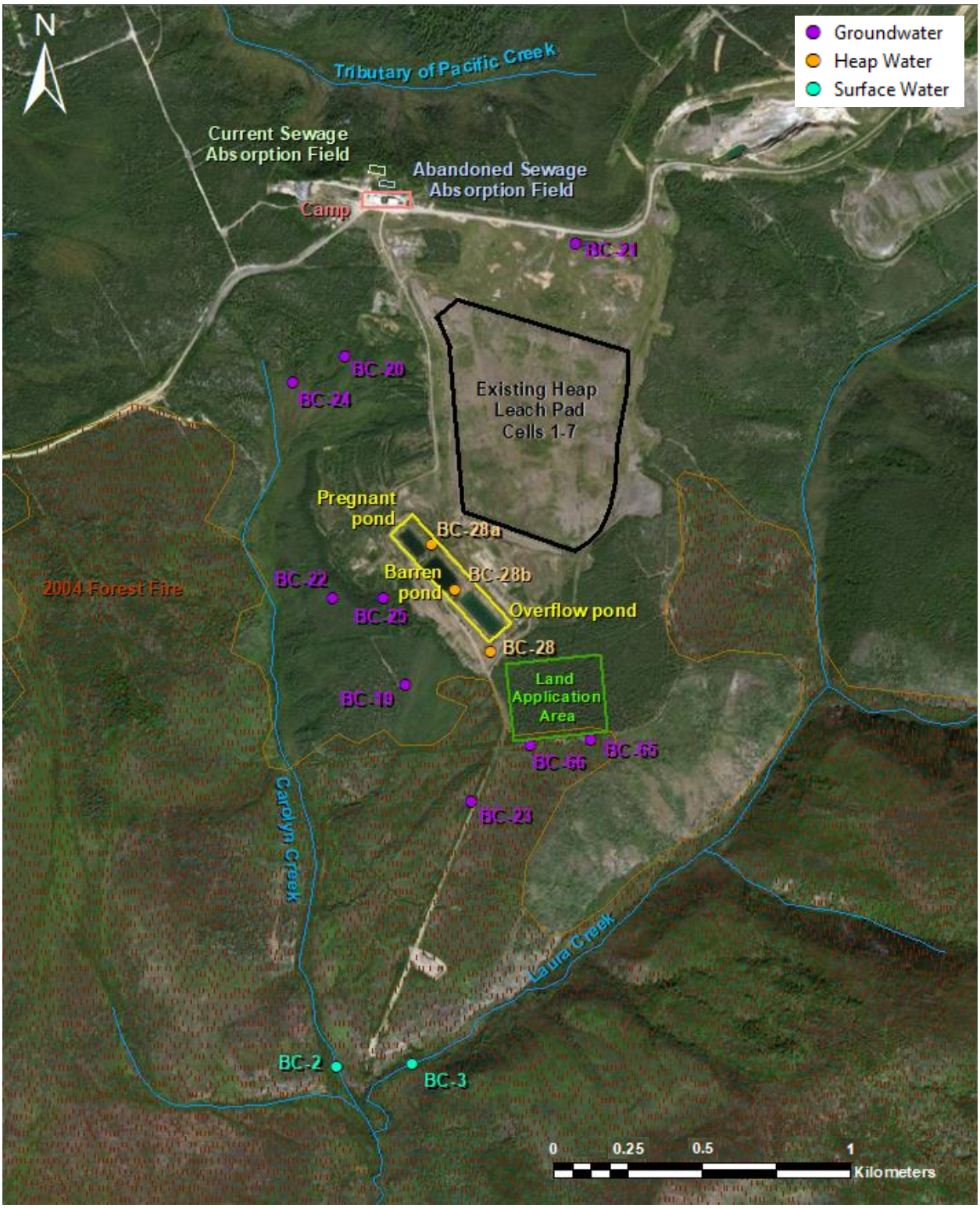

Figure 2: Scope of report discussion: The heap leach pad and immediately surrounding receiving water stations. Map identifies key components for reference. Note: the size and dimensions of the land application area may not be exactly to scale and the location of BC-65 may not be accurate as they are based on a figure of the land application lysimeter locations from the 2002 Annual Report.

Samples collected by WRB during the 2019 visit were compliant with Effluent Quality Standards and Water Quality Objectives in Water Licence QZ96-007

The samples collected from BC-66-2 were compared to the Effluent Quality Standards (EQS), which apply at this location as outlined in water licence QZ96-007 (condition 47). Groundwater well BC-66 is a nested well with a shallow (BC-66-1) and a deep (BC-66-2) sampling point. The EQS are assumed to apply to both shallow and deep intervals; however, the shallower well was dry at installation (Viceroy Minerals Corporation 2002b) and WRB has no record of sampling at this location and depth.

In addition, condition 44 of the licence lists EQS applying to the BC-28 water quality station, located on the south end of the overflow pond, where water can be discharged to either Laura Creek or the LAA. At the time of the site visit, the water level in the overflow pond was low and there was no water flowing out of it. It is WRB's understanding that this is a typical situation and discharge at BC-28 was sporadic in the last few years.

Condition 47 of the licence considers heap detoxification complete if the total cyanide concentration at BC-28a is below 2 mg/L for 5 years following detoxification. The heap has been detoxified for 17 years, with the concentration of total cyanide August 2019 of 0.574 mg/L).

Lastly, the sample collected from BC-39 (Laura Creek 50 meters upstream of the South Klondike River) by Golden Predator during the site visit was compared to the Water Quality Objective (WQO) for selenium of 3.8 ug/L (condition 45 of the licence). The selenium concentration at the time of the site visit was 1.57 ug/L and therefore met condition 45 of the licence.

The Licence does not specify whether the EQS apply to total or dissolved species; therefore, it was assumed that they apply to dissolved parameters for BC-66-2 (groundwater) and to total parameters for BC-28a (surface water). There were no exceedances of EQS or WQO of water licence QZ96-007 at the applicable stations at the time of the site visit (Table 1).

Table 1: Water Quality Compliance Summary for QZ96-007 for data from August 27-28, 2019.

Station	Parameter	Source of Standard	Standard (mg/L)	Lab Result (mg/L)
BC-28a	Cyanide, Total	WUL QZ96-007 (condition 47)	2.0	0.574
BC-66-2	Cyanide, WAD	WUL QZ96-007 (condition 43)	0.125	0.0021
BC-66-2	Cyanide, Total	WUL QZ96-007 (condition 43)	1.0	0.0046
BC-66-2	Ammonia (as N)	WUL QZ96-007 (condition 43)	7.5	0.047
BC-66-2	Copper	WUL QZ96-007 (condition 43)	0.1	<0.00040
BC-66-2	Arsenic	WUL QZ96-007 (condition 43)	0.25	<0.00050
BC-66-2	Antimony	WUL QZ96-007 (condition 43)	0.5	0.00033
BC-66-2	Mercury	WUL QZ96-007 (condition 43)	0.0025	<0.000010
BC-66-2	Zinc	WUL QZ96-007 (condition 43)	0.25	<0.0040
BC-66-2	Selenium	WUL QZ96-007 (condition 43)	0.3	0.0123
BC-66-2	Lead	WUL QZ96-007 (condition 43)	0.1	<0.00020
BC-66-2	Aluminum	WUL QZ96-007 (condition 43)	3.0	<0.0050
BC-66-2	Bismuth	WUL QZ96-007 (condition 43)	0.25	<0.00010
BC-66-2	Cadmium	WUL QZ96-007 (condition 43)	0.05	<0.000010
BC-66-2	Chromium	WUL QZ96-007 (condition 43)	0.25	0.00052
BC-66-2	Iron	WUL QZ96-007 (condition 43)	5.0	<0.010
BC-66-2	Manganese	WUL QZ96-007 (condition 43)	6.0	<0.00020
BC-66-2	Molybdenum	WUL QZ96-007 (condition 43)	0.25	0.00015
BC-66-2	Nickel	WUL QZ96-007 (condition 43)	0.25	<0.00040
BC-66-2	Silver	WUL QZ96-007 (condition 43)	0.05	<0.000050
BC-39	Selenium	WUL QZ96-007 (condition 45)	0.0038	0.00157

Heap water quality

As part of closure activities, Viceroy detoxified, rinsed, and covered the heap as authorized under Amendment 8 of the Water Licence QZ96-007. Details of the closure activities conducted on the heap and the process ponds are found in the 2003 Decommissioning and Reclamation Plan. Today, the heap is a free-draining system and contributes heap-derived water to the receiving environment. As such, a comprehensive assessment of the quality of the water flowing out of the heap was conducted using data collected during the August 2019 site visit and data produced by the licensee and inspectors for station BC-28 between years 2000 to present and for station BC-28a between 2005 (when this station was established) to present.

It should be noted that water quality is different at BC-28a (discharge from the heap into the pregnant pond) and BC-28 (south end of overflow pond and point of compliance). Water collected at BC-28a represents in-heap water. Water from BC-28a flows into the pregnant pond and then into the barren pond where biological treatment is ongoing since closure. From the barren pond, water flows into the overflow pond. When water levels in the overflow pond

reaches the elevation of the overflow pond spillway, water flows out at BC-28 and is discharged. In addition, water in the ponds likely infiltrates to ground due to liner removal. Lastly, there is an input of water to the three ponds from precipitation as rain and snow in and around the ponds. Water collected at BC-28 represents all water reporting from the heap and flowing through the ponds and direct precipitation.

Interpretations were made on available data, however amendment 8 of the water licence decreased the required frequency of monitoring. As a result, the sampling frequency was reduced to 1-3 times per year after 2008 and sampling was conducted only during the open water season (May to October). It should be noted that these changes in sampling frequency impede interpretations of water quality variability in present years, particularly for low flow conditions (November to April).

More specifically, this report focuses on cyanide, nitrate, sulphate, arsenic, antimony, and selenium. Cyanide, arsenic, antimony and selenium are regulated parameters for which the water licence defines EQS. As discussed previously, WRB has not observed exceedances of the EQS. On the other hand, nitrate and sulphate do not have EQS defined in the licence but they are parameters of interest to WRB as guidelines have been developed for both of these after the licence was issued. The Canadian Council of Ministers of Environment has established water quality guidelines for the protection of aquatic life (CCME WQG-PAL) for nitrate in 2012 while the British Columbia Ministry of Environment established hardness-dependent guidelines for sulphate in 2013. Furthermore, the Yukon Contaminated Site Regulations' numerical standards for the protection of aquatic life (CSR-AW) for sulphate is 1000 mg/L. The following sections compare the data at BC-28 and BC-28a with EQS and/or water quality guidelines to build an understanding of the potential impact of the discharge of heap water if it were to be discharged to the environment. These results are not for compliance purposes.

Cyanide

Heap detoxification commenced in 2002 to reduce the concentrations of cyanide present during heap leaching operations. Since then concentrations have been decreasing over time and remaining below 2 mg/L (Figure 3). Total cyanide encompasses various forms of cyanides, including metal cyanide complexes and free cyanide. Metal complexes can degrade readily (accounted as "WAD Cyanide") or slowly and release free cyanide (CN^-), which is the toxic form of cyanide. Water Licence QZ96-007 defines EQS for WAD cyanide and total cyanide at BC-28. The presence of cyanide at BC-28a did not cause non-compliance at BC-28 since no water was discharged at the time of the site visit.

The presence of cyanide at BC-28a after detoxification is consistent with the cyanide degradation model presented in Declercq et al. (2016) (Figure 4). Declercq et al. (2016) assumes there is some cyanide remaining in the heap after detoxification, i.e. detoxification is not 100% effective. They predict that, due to limited flow of water through a heap after the initial detoxification and draining cycle, the cyanide concentration is expected to remain stable

for many years in the lower portion of the heap where cyanide degradation is unlikely to happen and to be detected in a storage pond downgradient of the heap.

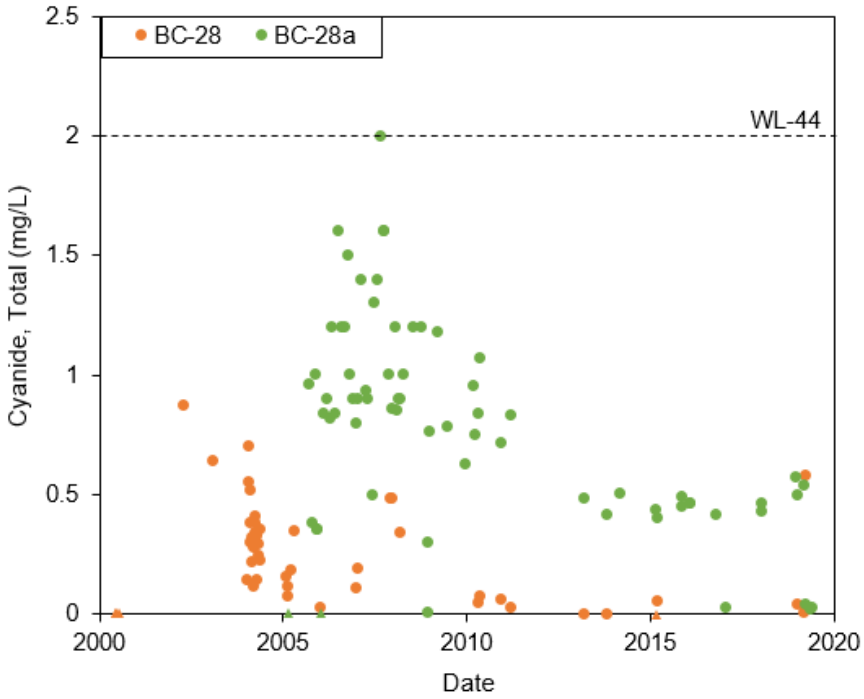

Figure 3: Concentrations of total cyanide in heap-derived waters at BC-28 and BC-28a. Triangle points indicate non-detects. WL-44 line is water licence EQS condition 44 (discharge from BC-28 or BC-28b).

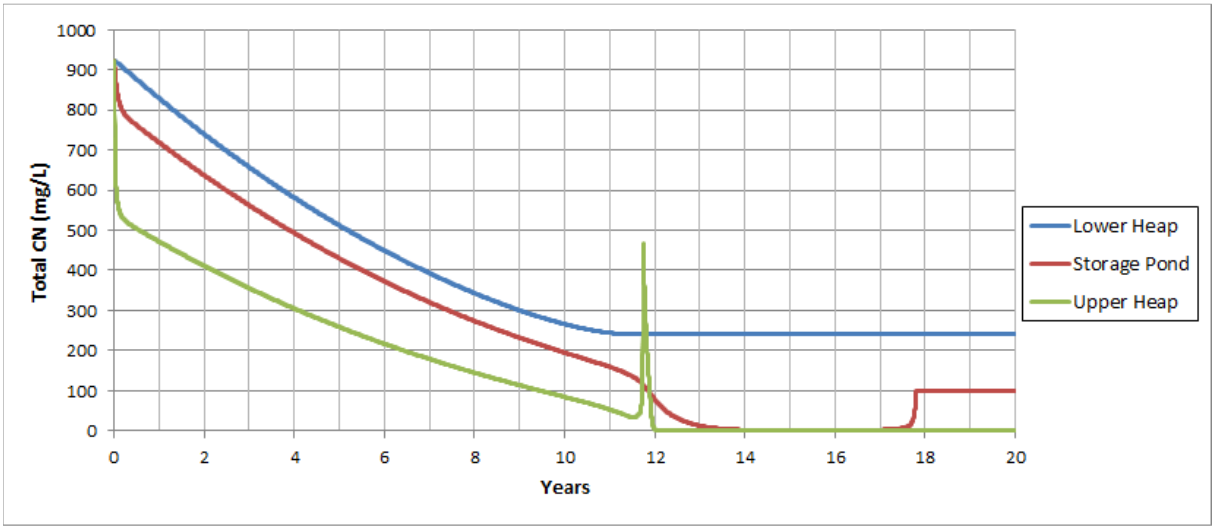

Figure 4: Modelled cyanide concentrations in the upper and lower area of a heap and in a storage pond downgradient, from Declercq et al. (2016).

Nitrate

Nitrate concentrations have been at levels up to 450 mg NO_3^--N/L in the heap at BC-28a (Figure 5) and are elevated compared to the CCME WQG-PAL which is set at 3 mg NO_3^--N/L (long-term guideline). Nitrate is a nutrient but is toxic to aquatic organisms at high concentrations and is suspected to cause reduction in the ability of blood to carry oxygen in aquatic organisms and an increased risk of algal blooms and eutrophication (CCME 2012).

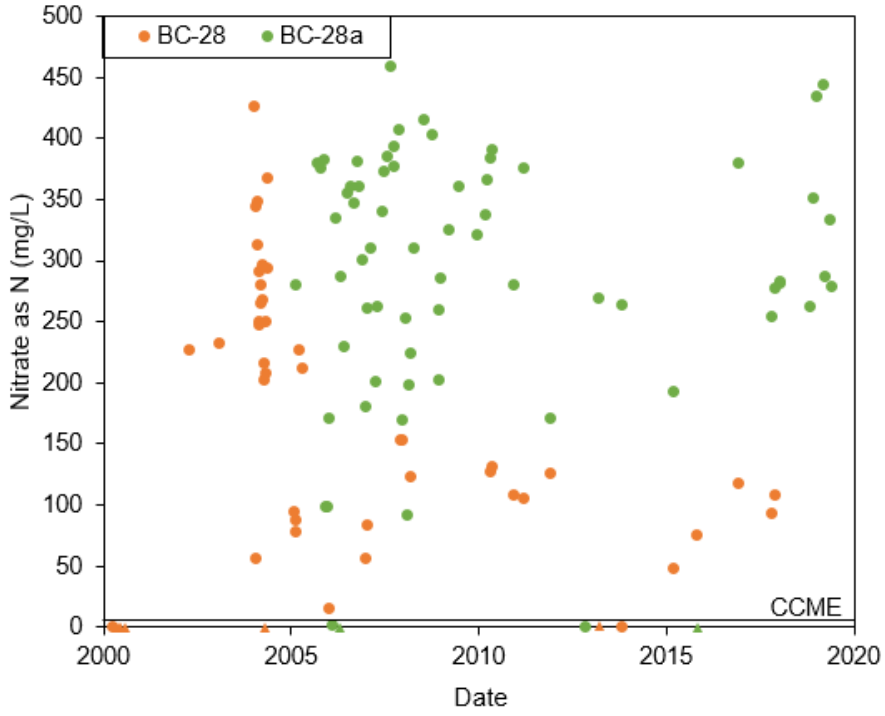

Figure 5: Concentrations of nitrate in heap-derived waters at BC-28 and BC-28a. Triangle points indicate non-detects. CCME is Canadian Council of Ministers of the Environment's Water Quality Guidelines.

Nitrate is naturally present in unimpacted waterbodies; however, not in elevated concentrations as seen in heap water. Nitrate in the heap water is presumed to be a product of cyanide degradation. Nitrate is commonly associated with cyanide heap effluent because nitrate is one of the degradation products formed during detoxification of cyanide. More specifically, the cyanide degradation mechanisms include volatilization of hydrogen cyanide (HCN), destruction under ultraviolet (UV) light, and biodegradation (Declercq et al. 2016). Biodegradation converts cyanide (CN) and metal-cyanide complexes into ammonia (NH3), and subsequently converted through microbial action into nitrate (USEPA 1994). Molasses, molasses concentrate-based sugar syrup and phosphoric acid were circulated through the Brewery Creek heap during detoxification in May to August 2002 to promote biological degradation of cyanide into ammonia. Ammonia was then expected to degrade further into nitrate, and finally nitrate could possibly be further transformed into diatomic nitrogen gas (Viceroy Minerals Corporation 2003b and 2003c).

The release of heap water with elevated concentrations of nitrate was predicted by Viceroy in 2003, as described in the nitrogen balance presented in Volume IV - supplemental information of the Decommissioning and Reclamation Plan 2003. Based on the total amount of cyanide added to the heap during operation and the moisture content in the pile and assuming that all cyanide was degraded into nitrate, the maximum concentration of nitrate in pore water at the time of detoxification would have been 613 mg NO_3^--N/L (Viceroy Minerals Corporation 2003b). Presumably, at that time high concentrations of nitrate in heap water was not seen as an issue since nitrate was not a regulated parameter, as opposed to the other forms of nitrogen like cyanide and ammonia.

Table 2 presents an updated, approximate nitrogen balance assuming that the heap contains 9.5 million tons (Viceroy Minerals Corporation 2003b) with stacked ore density of 1.6 t/m^3 (Loki Gold Corporation 1995) and a moisture content of 9.63% in the final heap draindown (Tetratech 2012). In these conditions, the amount of water contained in the heap, referred as one bed volume, is approximately 570,000 m^3. Precipitation on site is assumed as 325.5mm/yr as snow melt and rain minus snow sublimation (EBA 2012). According to the observations made by Alexco Resources Corp (2009), the cover on the heap allows for infiltration of 24% of water, therefore there was approximately 1,720,000m^3 of water flowing under the cover and through the heap between 2003 and 2019. In other words, there has been 0.7 bed volumes passing through the pile. However, this water balance does not account for runoff of rainwater outside of the lined perimeter nor for increasing evapotranspiration rate as the vegetation grows on the cover. Therefore, it is likely that less than 0.7 bed volume actually passed through the heap.

The amount of water that flowed through the pile and rinsed nitrate and other parameters out of the pile is an interesting consideration to assess the likeliness of nitrate concentrations remaining high in the near future. For the sake of simplicity, we can assume idealized piston- or plug-flow conditions in the heap, in which infiltrating water displaces an equivalent amount of pore water (i.e. no dilution or change in storage), although this is not likely in reality. We also make the assumption here that the heap has reached a steady state and that there was no input of nitrate to the pile and no output either. Based on these assumptions, we can consider that only 70% of the nitrate initially present in the pile has been flushed out of the pile and 30% is still remaining in the pile, meaning that the concentration of nitrate would remain stable at BC-28a for another 7 years at a minimum. Most likely, flow is not plug flow and less water has flowed through the pile than calculated, therefore nitrate will continue to be high for more than 7 years.

Table 2: Approximate heap water balance.

Parameter	Value	Unit
Stacked ore density (ρ)	1.6	t/m^3
Ore stored on heap pad (M_{ore})	9,500,000	t
Humidity in stacked ore (h)	9.63	%
Volume of ore on the heap ($V_{ore} = M_{ore} / \rho$)	5,937,500	m^3
Volume of water on the heap (1 bed volume) (BV= $V_{ore} * h$)	**571,781**	**m^3**
Average yearly precipitation minus snow sublimation (P)	325.5	mm/yr
Surface of the heap pad (A)	311,000	m^2
Infiltration through cover (i)	24	%
Volume of water in the heap 2003-2019 ($V_w = P*A*i*n_{years}$	**413,020**	**m^3**
No. of bed volumes passed through the pile since detox (V_w / BV)	**0.7**	

Sulphate

Sulphate is also present in the heap in high concentrations and has been increasing between 2005 (around 400 mg/L) to present (near or above 1000 mg/L). Sulphate concentrations at BC-28 and BC-28a are presented in Figure 6 along with the CSR-AW (1000 mg/L). The CSR-AW was exceeded 4 times between 2018-2019.

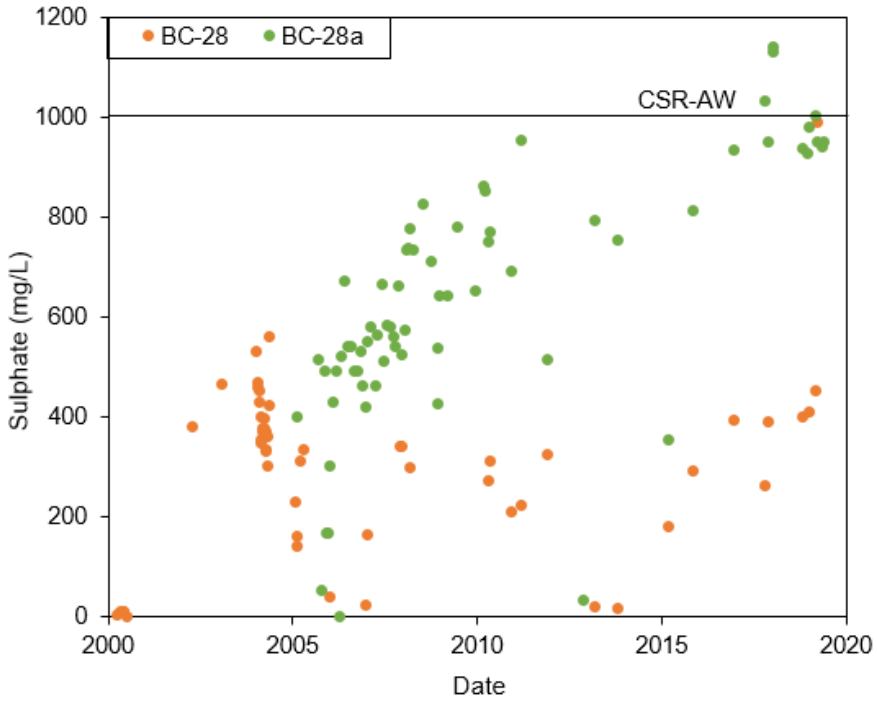

Figure 6: Concentrations of sulphate in heap-derived waters at BC-28 and BC-28a. CSR-AW is the Yukon Contaminated Sites Regulation sulphate standard for the protection of aquatic life.

The release of sulphate from the heap is thought to be caused by the development of oxidizing conditions in the heap, as indicated by the presence of oxidized compounds such as nitrate (NO3) and sulphate (SO4) and the reduction of the concentrations of reduced species such as ammonia (NH3). The ore originally transported to the heap for gold recovery contained sulfide minerals and the exposure of sulphide ore to the atmosphere (air and infiltrating meteoric water) promotes oxidation of the sulphide minerals and production of sulphate, resulting in an increase in sulphate concentrations and potentially in metals and acidity. However, it appears that the ore stored in the heap has high neutralization potential and is not expected to generate acidity (Viceroy Minerals Corporation 2002a). This belief was reinforced by historical records and the August 2019 observations on site when the water discharged from the heap had a neutral pH (see field pH in Appendix C) and high alkalinity. Acid Rock Drainage (ARD) is not expected to be of concern at this site however the increasing sulphate concentration in BC-28a as a result of oxidation in the heap indicates that the heap is currently producing Neutral Mine Drainage (NMD). Neutral pH drainage can lead to the leaching of metals that are soluble in neutral pH such as antimony, arsenic, and selenium.

Additionally, it is WRB's understanding that the addition of carbon sugars and phosphoric acid created reducing conditions in the heap for a short period of time during detoxification to degrade cyanide. However, reducing conditions were not meant to last over the long-term as oxidizing conditions in the heap were expected (personal communication with Joseph Harrington, April 30th 2020). Column studies on heap detoxification suggested that creating oxidizing conditions in the heap would limit the release of metalloids (arsenic, antimony and selenium) due to adsorption of the metalloids on the surface of iron oxides.

Metals

The concentrations of arsenic, antimony and selenium at BC-28 and BC-28a are presented in figures 7 to 9 below. The EQS defined in the water licence for BC-28 are presented in the graph; however, they do not apply to BC-28a. Still, the EQS were established for effluent discharged to surface water in the receiving environment to protect aquatic systems. While heap-derived water is not discharged to surface water at BC-28a, it is likely discharged to ground through infiltration and will reach downgradient groundwater and surface water at some point. Therefore, the concentrations observed at BC-28a have been compared to the EQS specified in the licence for BC-28 (surface water) and aquatic protection guidelines (CCME WQG-PAL and CSR-AW).

Arsenic

Total arsenic concentrations at BC-28a in August 2019 (0.306 mg/L) was not above the EQS defined for BC-28 (0.5mg/L) and has not exceeded over the period of record. The CCME WQG-PAL and CSR-AW for arsenic is 0.005mg/L, which has been frequently exceeded at both BC-28 and BC-28a over the period of record (Figure 7).

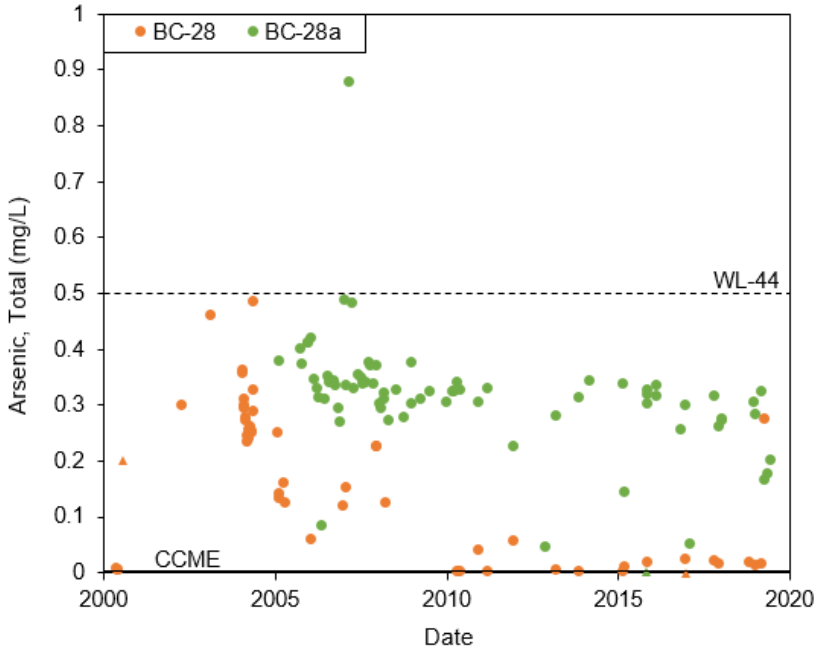

Figure 7: Concentrations of total arsenic in heap-derived waters at BC-28 and BC-28a. Triangle points indicate non-detects. CCME is Canadian Council of Ministers of the Environment's Water Quality Guidelines. The WL-44 line is water licence EQS condition 44 (discharge from BC-28 or BC-28b).

Selenium

The total selenium concentration observed at BC-28a in August 2019 (0.188 mg/L) was not above the EQS defined for selenium at BC-28 but it exceeded the CCME WQG-PAL, which is 0.001 mg/L.

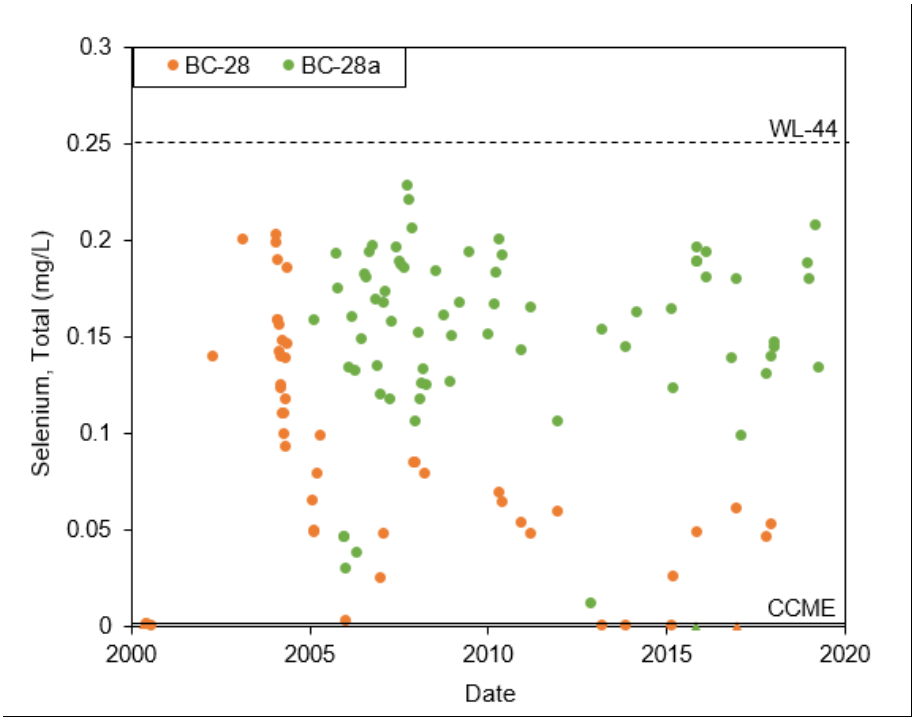

Figure 8: Concentrations of total selenium in heap-derived waters at BC-28 and BC-28a. Triangle points indicate non-detects. The WL-44 line is water licence EQS condition 44 (discharge from BC-28 or BC-28b).

Antimony

Antimony concentration observed at BC-28a in August 2019 (2.08 mg/L) exceeded the EQS defined in the licence at 1.0 mg/L, and also the CSR-AW of 0.2 mg/L. Notably, antimony was below water licence EQS at BC-28 while discharging, however since 2005 concentrations have been elevated at BC-28a and appears to be increasing (Figure 9).

The increase in antimony concentrations at BC-28a aligns with the discussion in the previous subsection about the release of neutral mine drainage from the heap, following oxidation of the ore. Antimony (Sb) atoms tends to replace the sulphur (S) atom in various species and the oxidation of the ore causes the production of sulphate, SO_4^{2-}, but also possibly the production of antimonite, SbO_4^{3-}. An increased production of antimonite would lead to the increase of antimony concentration in the heap-produced water and would explain the increase at BC-28a.

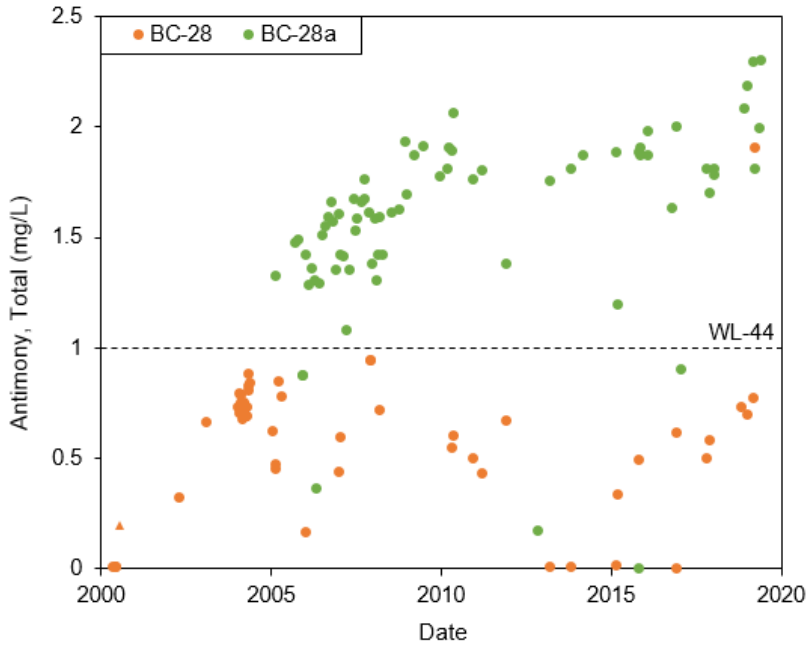

Figure 9: Concentrations of total antimony in heap-derived waters at BC-28 and BC-28a. Triangle points indicate non-detects. WL-44 is water licence EQS condition 44 (discharge from BC-28 or BC-28b).

Surface water quality downgradient of the heap leach pad

Nitrate, cyanide, sulphate, antimony, arsenic, and selenium concentrations are graphically presented over time for the two surface water bodies downgradient of the heap leach pad, Carolyn and Laura creeks in figures 10-15. The graphs presented below are based on data available to WRB at the time of writing.

Cyanide

During operations and discharge of effluent (1995-2004), cyanide concentrations were below 0.15 mg/L in Carolyn Creek (BC-2), with a temporary spike up to nearly 0.25mg/L during discharge to the LAA (2002-2004). In Laura Creek (BC-3), concentrations have been generally below 0.05mg/L over the period of record (1996-present). Since 2008, cyanide concentrations have been below 0.01mg/L at BC-2 and BC-3.

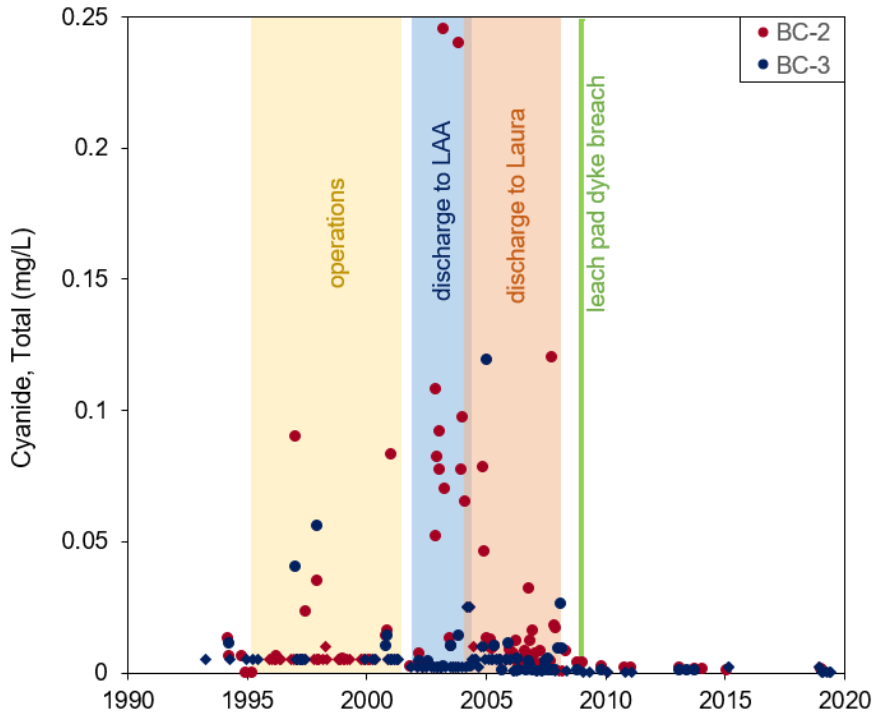

Figure 10: Concentrations of total cyanide at BC-2 (Carolyn Creek) and BC-3 (Laura Creek). Triangle points indicate non-detects. Yellow vertical bar indicates timing of mine operations; blue vertical bar indicates the period of discharge to the land application area (discharge was not continuous); orange bar indicates the period of discharge directly to Laura Creek (discharge was not continuous); green vertical line indicates when the leach pad dyke was breached.

Nitrate

From 1996-2001, nitrate at BC-2 was generally below 0.1mg NO_3^--N/L. Since 2002, nitrate concentrations increased by three orders of magnitude, exceeded CCME WQG-PAL, and reached a maximum of nearly 100mg NO_3^--N /L. Since 2009, nitrate appears to have decreased. In 2019 nitrate concentrations at Carolyn Creek (BC-2) were elevated above CCME's WQG-PAL (3.59 mg/L).

In Laura Creek (BC-3), nitrate concentrations from 1995 to 2002 were generally below 0.2 mg NO_3^--N/L. From 2002-2009 concentrations rose to around CCME WQG-PAL (3mg NO_3^--N/L), and then fell back to pre-2002 concentrations.

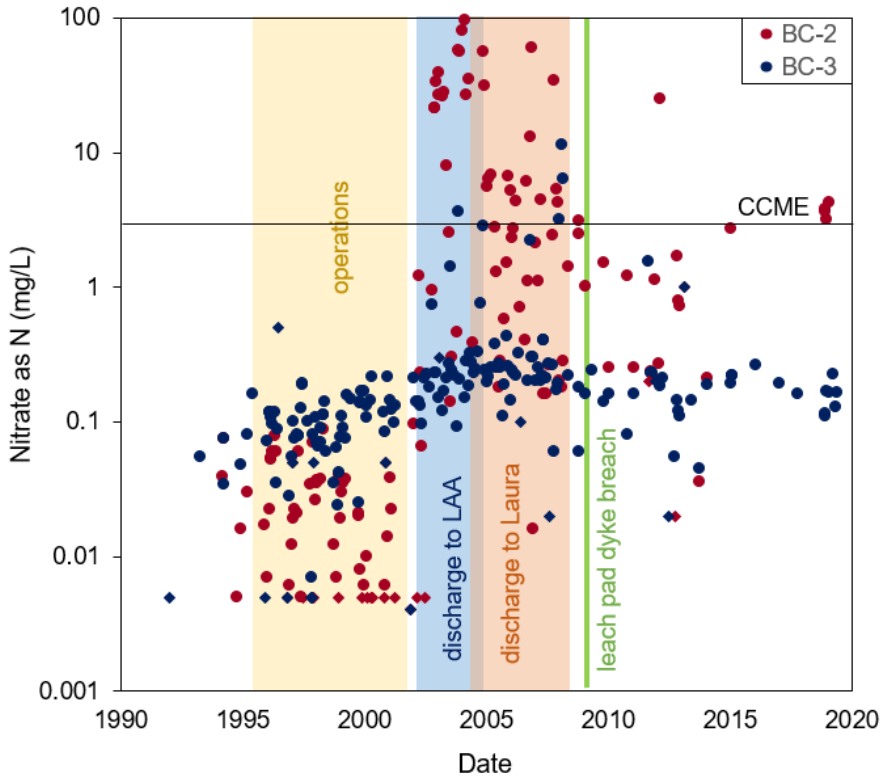

Figure 11: Concentrations of nitrate as nitrogen at BC-2 (Carolyn Creek) and BC-3 (Laura Creek). Note a log scale was used to highlight range in concentrations. Triangle points indicate non-detects. Yellow vertical bar indicates timing of mine operations; blue vertical bar indicates the period of discharge to the land application area (discharge was not continuous); orange bar indicates the period of discharge directly to Laura Creek (discharge was not continuous); green vertical line indicates when the leach pad dyke was breached. CCME is Canadian Council of Ministers of the Environment's Water Quality Guideline for nitrate as nitrogen.

Sulphate

Sulphate concentrations at BC-2 and BC-3 were generally below 300mg/L over the period of record, with higher concentrations close to 800mg/L observed during low flow (January to April). Between 2007-2008, sulphate concentrations rose to almost 1000mg/L. Since 2009, concentrations were below 200mg/L, however in 2019 higher concentrations were observed, reaching nearly 400mg/L.

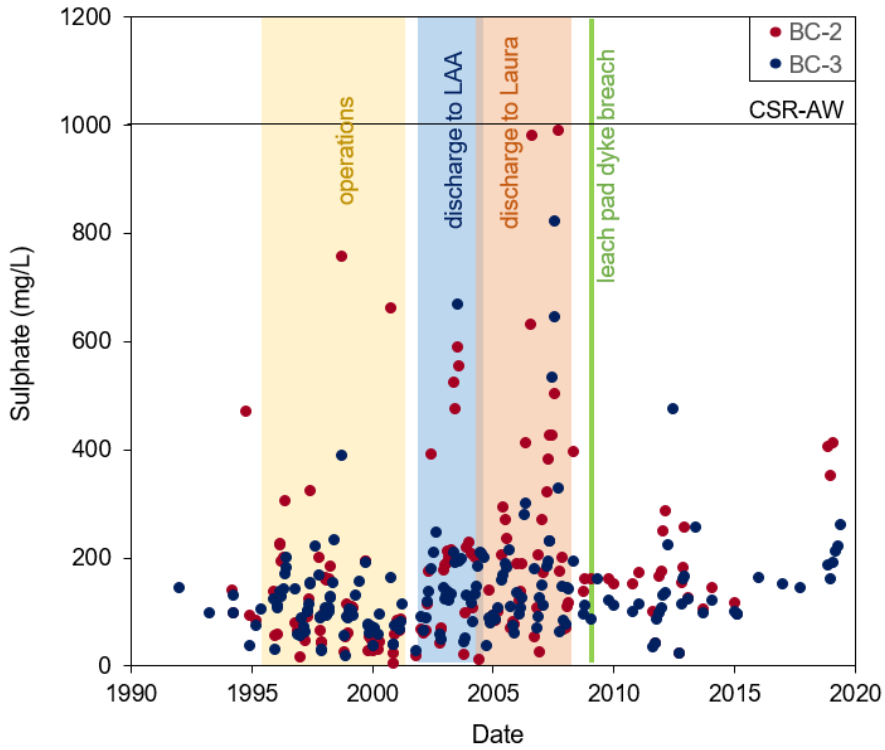

Figure 12: Concentrations of sulphate at BC-2 (Carolyn Creek) and BC-3 (Laura Creek). Triangle points indicate non-detects. Yellow vertical bar indicates timing of mine operations; blue vertical bar indicates the period of discharge to the land application area (discharge was not continuous); orange bar indicates the period of discharge directly to Laura Creek (discharge was not continuous); green vertical line indicates when the leach pad dyke was breached. CSR-AW is Yukon Contaminated Sites Regulation sulphate standard for the protection of aquatic life.

Arsenic

From 1995 to present arsenic concentrations commonly exceeded CCME WQG-PAL in both Carolyn and Laura creeks. From 1995-2009 there were infrequent spikes in concentrations up to 0.2mg/L, mostly in Laura Creek.

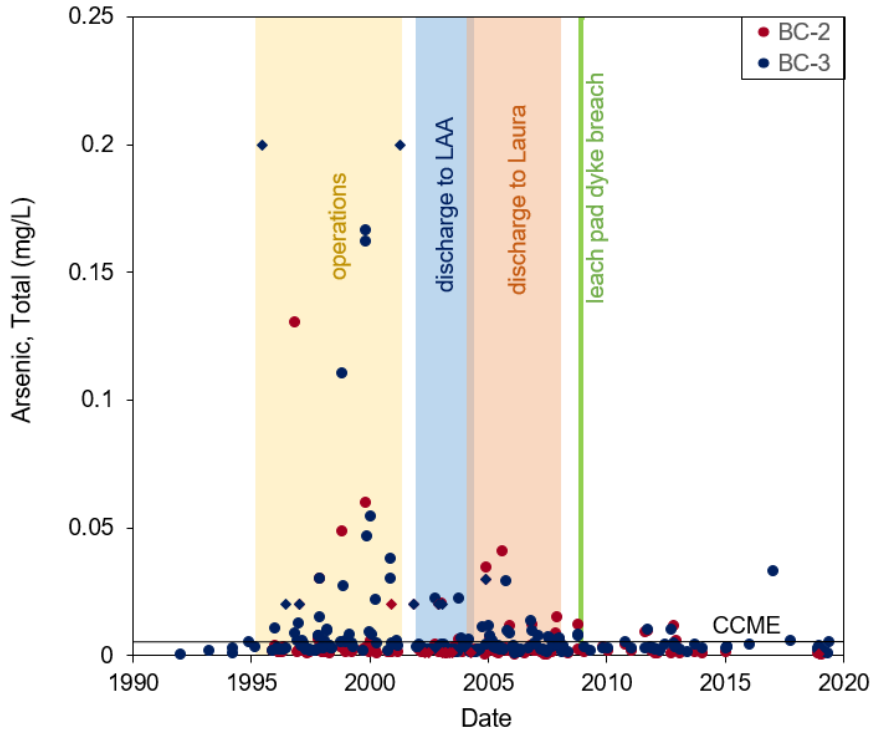

Figure 13: Concentrations of total arsenic at BC-2 (Carolyn Creek) and BC-3 (Laura Creek). Triangle points indicate non-detects. Yellow vertical bar indicates timing of mine operations; blue vertical bar indicates the period of discharge to the land application area (discharge was not continuous); orange bar indicates the period of discharge directly to Laura Creek (discharge was not continuous); green vertical line indicates when the leach pad dyke was breached. CCME is Canadian Council of Ministers of the Environment's Water Quality Guideline for arsenic.

Antimony

Antimony is generally below 0.01 mg/L, with frequent increases to around 0.02 mg/L and infrequent increases up to a maximum of 0.2 mg/L, mostly in Laura Creek. Concentrations of antimony appear more stable over the last decade, however, monitoring has been conducted only in the summer season and therefore annual variability may not be represented.

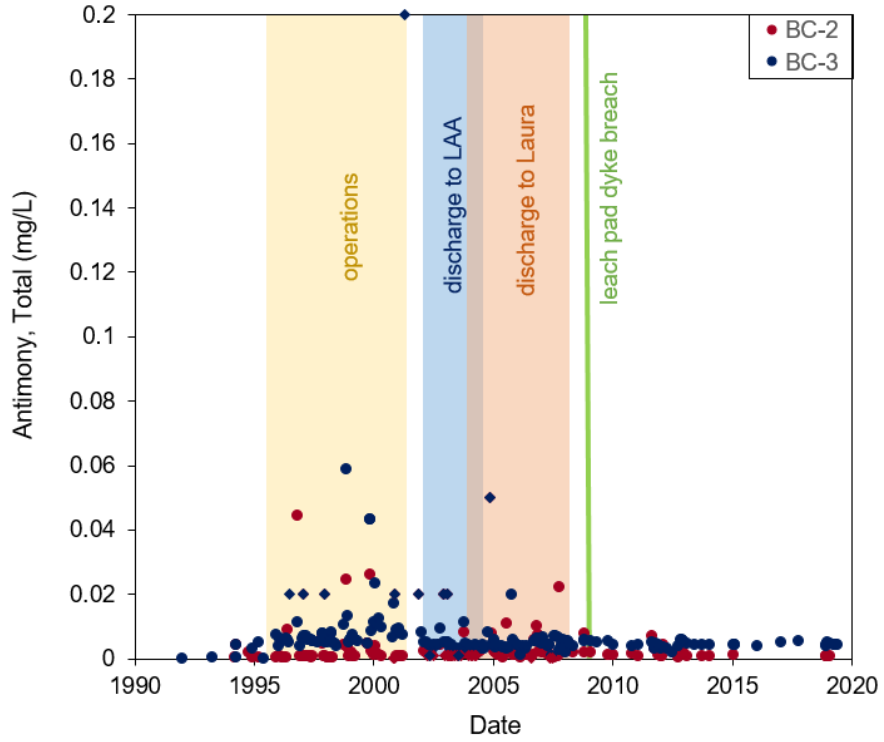

Figure 14: Concentrations of total antimony at BC-2 (Carolyn Creek) and BC-3 (Laura Creek). Triangle points indicate non-detects. Yellow vertical bar indicates timing of mine operations; blue vertical bar indicates the period of discharge to the land application area (discharge was not continuous); orange bar indicates the period of discharge directly to Laura Creek (discharge was not continuous); green vertical line indicates when the leach pad dyke was breached.

Selenium

Lastly, over the period of record selenium was frequently above CCME WQG-PAL. In 2003 at both BC-2 and BC-3 concentrations were higher than previously observed up to a maximum of 0.11mg/L.

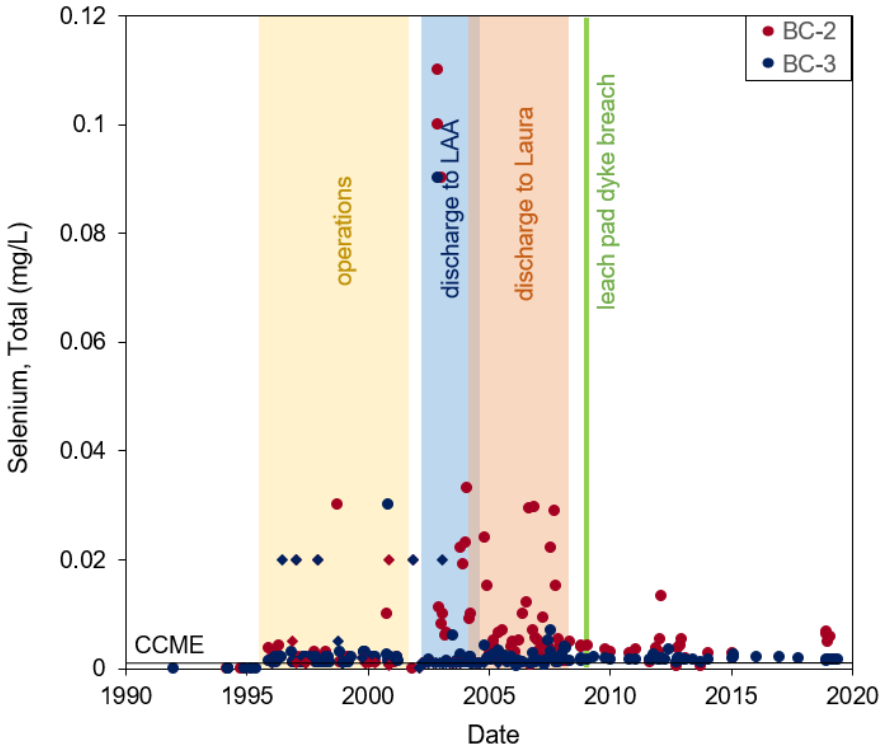

Figure 15: Concentrations of total selenium at BC-2 (Carolyn Creek) and BC-3 (Laura Creek). Triangle points indicate non-detects. Yellow vertical bar indicates timing of mine operations; blue vertical bar indicates the period of discharge to the land application area (discharge was not continuous); orange bar indicates the period of discharge directly to Laura Creek (discharge was not continuous); green vertical line indicates when the process ponds' liners were removed. CCME is Canadian Council of Ministers of the Environment's Water Quality Guideline for selenium.

Groundwater in the heap leach pad area

A semi-confined fractured rock aquifer underlies the leach pad area (Loki Gold Corp. 1994). As far as WRB is aware, all of the relevant monitoring wells are completed in this aquifer. The aquifer comprises low metamorphic grade Devonian-Mississippian clastics of the Earn Group (Loki Gold Corp. 1994). The original evaluation of the hydrogeology of the site reported that, "*the mapping of the equipotential surfaces indicates the fractures are of sufficient density to be treated as having similar hydraulic properties of an intergranular medium*" (Loki Gold Corp. 1994).

The role of permafrost (and permafrost degradation) in influencing groundwater flow and solute transport in the leach pad area is unclear. The Updated Baseline Hydrogeological Assessment states (pg. 50) "*There was no indication of permafrost conditions in the Moosehead, Leach Pad, Lower Foster, Kokanee, Golden, and Lucky areas*" (Tetra Tech 2016). However, the original Evaluation of the Hydrogeology of the Heap Leach Site states that "*discontinuous permafrost conditions are observed in the grid-north end of Carolyn Creek from heap leach test pits*" (pg. 2-1) and "*a large area of permafrost, delineated from auger holes, was visible…*" (pg. 2-2) (Loki Gold Corp. 1994).

Direction of groundwater flow

Figure 2 shows a map of the site components and groundwater and surface water monitoring stations in the heap leach pad area. Figure 16 shows a groundwater equipotential map (based on groundwater levels observed in August 2012) of approximately the same area, as presented in the Updated Hydrogeology Baseline Assessment (Tetra Tech 2016). This is the most recent groundwater equipotential map available for the relevant area. A contour map of the potentiometric groundwater surface based the most recent available groundwater levels at all relevant groundwater monitoring wells would provide insight into current groundwater flow directions and hydraulic gradients.

Key observations from Figure 16:

- Groundwater in the heap leach area is shown to be generally flowing to the southwest towards Carolyn Creek.
- BC-21 is shown to be upgradient of the leach pad in an area with no significant horizontal hydraulic gradient towards the well.
- BC-19, BC-20, BC-22, BC-24, and BC-25 are shown to be downgradient of the leach pad.
- BC-19, BC-22, and BC-25 are shown to be also downgradient of the process ponds.
- BC-23, BC-65, BC-66-1, and BC-66-2 are shown to be crossgradient of the LAA.

- BC-20, BC-23, BC-24, and BC-25 are shown on Figure 2 but not on Figure 16 of this report. These wells are not depicted on the groundwater equipotential map presented, nor mentioned at all in the Updated Hydrogeology Baseline Assessment (Tetra Tech 2016). The reason for this is unknown to WRB. WRB reviewed its records and found groundwater quality data from 1996-2003 for BC-20 and BC-23, 1996-2000 for BC-24, and 1996-1997 for BC-25.

WRB measured groundwater levels in BC-19, BC-21, BC-22, and BC-66-2 during the site audit in August 2019 (Appendix C). The groundwater flow direction interpreted based on these data, for the area bounded by these four monitoring wells, is consistent with that shown in Figure 16.

The shallower well at BC-65 was water-bearing at the time of installation (Viceroy Minerals Corporation 2002b) but WRB has no record of sampling at this location and depth. All documentation reviewed by WRB refers to the deeper well at BC-65 as, simply, "BC-65." The shallower well identified as BC-66-1 was dry at installation (ibid) and WRB has no record of sampling at this location and depth. The deeper well at this location is referred to as BC-66-2.

Viceroy Mineral Corporation interpreted that groundwater underlying the LAA was generally flowing to the southeast and discharging to Laura Creek and to Carolyn Creek only during storm events (Viceroy Minerals Corporation 2001). This contradicted the Evaluation of the Hydrogeology of the Heap Leach Site issued in 1994, which concluded that "*all discharge from the aquifer is anticipated as baseflow discharge into the lower third of Carolyn Creek*" (Loki Gold Corp. 1994). The Updated Baseline Hydrogeology Assessment (Tetra Tech 2016) referenced, and did not contradict, the interpretation presented in Loki Gold Corp. 1994. A case study commissioned by Government of Yukon in 2011 (EBA 2011) identified that a lack of hydrogeological understanding prior to mine commissioning was a major issue that made effluent tracking difficult. Section 4.3.3.1 of the report notes the following: "*One of the major issues raised with groundwater discharge was the difficulty of tracking effluent. One interviewee raised concerns that baseline groundwater flows were not properly identified prior to mine commissioning. Therefore, it was difficult to determine the best locations for groundwater monitoring stations (stations that track effluent and water quality)*" (EBA 2011). Section 6.0 of the Report (Conclusions and Recommendations) further states that "*appropriate definition of groundwater flows would have provided a better understanding of the groundwater flow regime and best locations for groundwater monitoring stations*" (EBA 2011).

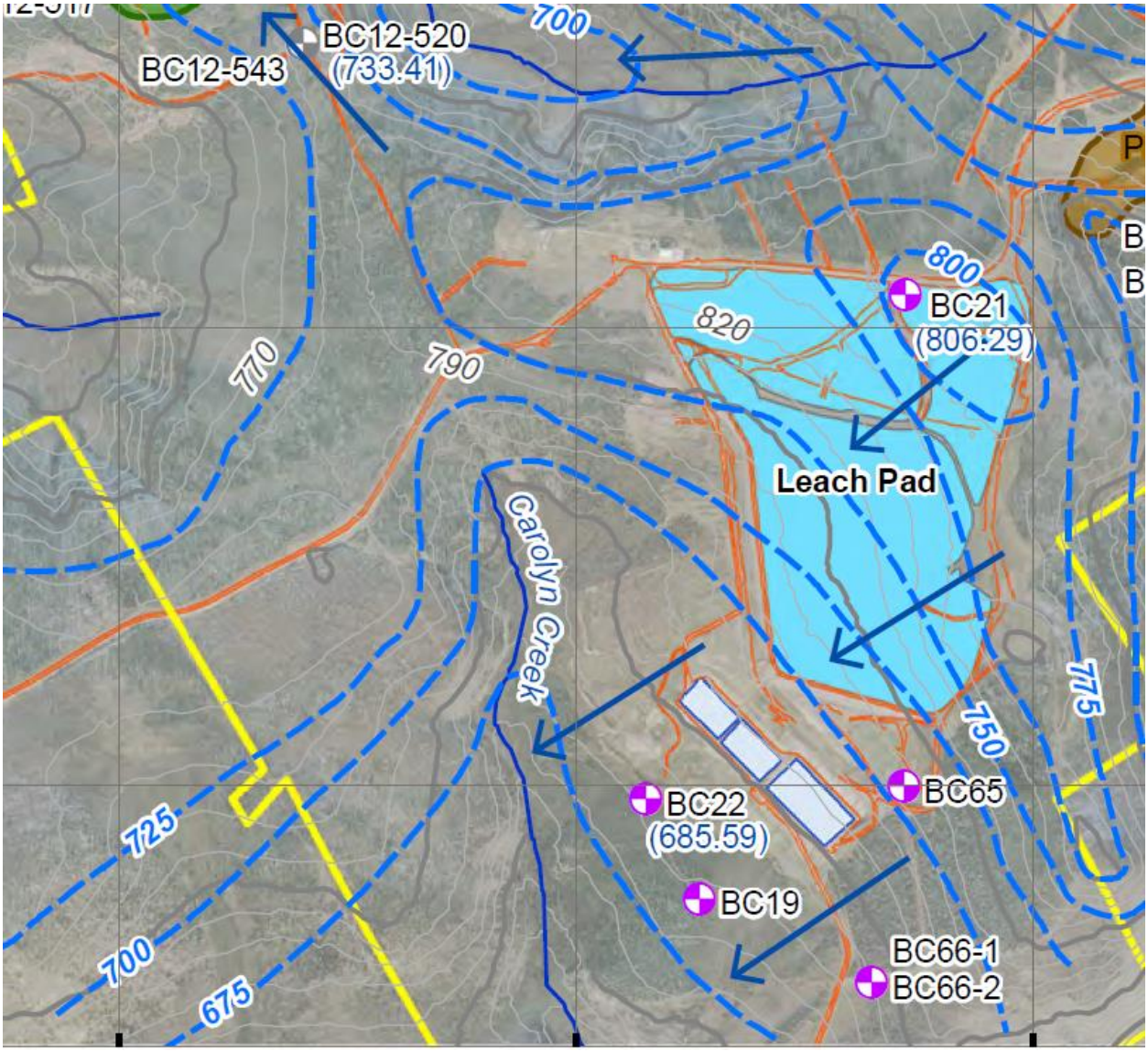

Figure 16: Groundwater equipotential map (based on groundwater levels observed in August 2012) as presented in the Updated Hydrogeology Baseline Assessment (Tetra Tech 2016).

Rate of groundwater flow

The Updated Hydrogeology Baseline Assessment (Tetra Tech 2016) does not include well logs or report screen lengths or dates of completion for the relevant monitoring wells (BC-19, BC-20, BC-21, BC-22, BC-23, BC-24, BC-25, BC-65, BC-66-1, and BC-66-2). It does not refer at all to BC-20, BC-23, BC-24, or BC-25. WRB located geologic logs and installation as-built drawings for BC-65 and BC-66-1 and BC-66-2, which were installed in May 2002 (Viceroy Minerals Corporation 2002b) but was unable to locate this information for the remaining, relevant wells. WRB recommends that this information be located and compiled.

Tetra Tech estimated the horizontal hydraulic gradient in the bedrock aquifer by conducting slug tests in monitoring wells BC-21 and BC-65, and inferred hydraulic conductivities at these locations (Tetra Tech 2016). Tetra Tech estimated the average linear flow velocity of

groundwater in the bedrock aquifer in the area of the leach pad to range from about 10 to 50 m/year (Tetra Tech 2016). Loki Gold Corp. previously estimated the average linear flow velocity of groundwater in the bedrock aquifer to range from about 150 to 300 m/year in the northern part of the leach pad area to about 2.3 to 4.7 km/year in the southern part of the leach pad area (Loki Gold Corp. 1994). According to Tetra Tech, the reason for these differences is likely that only two monitoring wells were tested as part of each study and that the combined results reflect the natural variability in hydraulic conductivity in the area of the leach pad (Tetra Tech 2016).

Groundwater quality

Cyanide

- BC-66-2 was installed in May 2002 (Viceroy Minerals Corporation 2002b). WAD cyanide in BC-66-2 has been observed at concentrations (up to 0.09 mg/L) that exceed all observations made in all other monitoring wells in the heap leach pad area (Figure 17). WAD cyanide concentrations in this monitoring well have not been observed to exceed the EQS (0.125 mg/L); however, they have been equal to or greater than the CSR-AW (0.05 mg/L) during several sampling events from 2002-2005 (Figure 17). WAD cyanide concentrations in this well generally decreased from 2002-2009 (Figure 17).

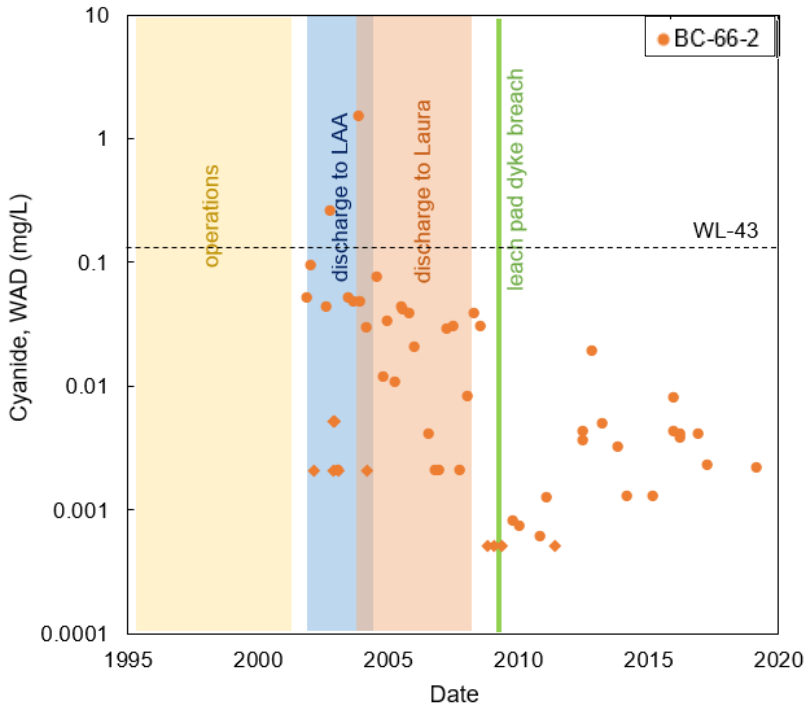

Figure 17: Concentrations of WAD cyanide at groundwater well BC-66-2. WL-43 is water licence EQS for groundwater at BC-66 and BC-65 (0.125mg/L).

Nitrate

Lysimeters

As mentioned above, twenty-two lysimeters of varying depths were installed within the LAA (Viceroy Minerals Corporation 2002b). WRB has records of lysimeter water quality for 2002 and 2003. The average concentration of nitrate in these lysimeters (all depths in 2002 and 2003; n = 78) was 124 mg NO_3^--N/L with a range from 1.1 to 418 mg NO_3^--N/L (Figure 18).

Seepage

As mentioned above, seepage at the toe of the land application area was observed and sampled during active solution release in 2002 and 2003 (Viceroy Minerals Corporation 2002a and 2004a). WRB has records of seepage water quality from 2002 and 2003 only. The average concentration of nitrate in the seepage (n = 8) was 167 mg NO_3^--N/L with a range of 10.6 to 278 mg NO_3^--N/L (Figure 18).

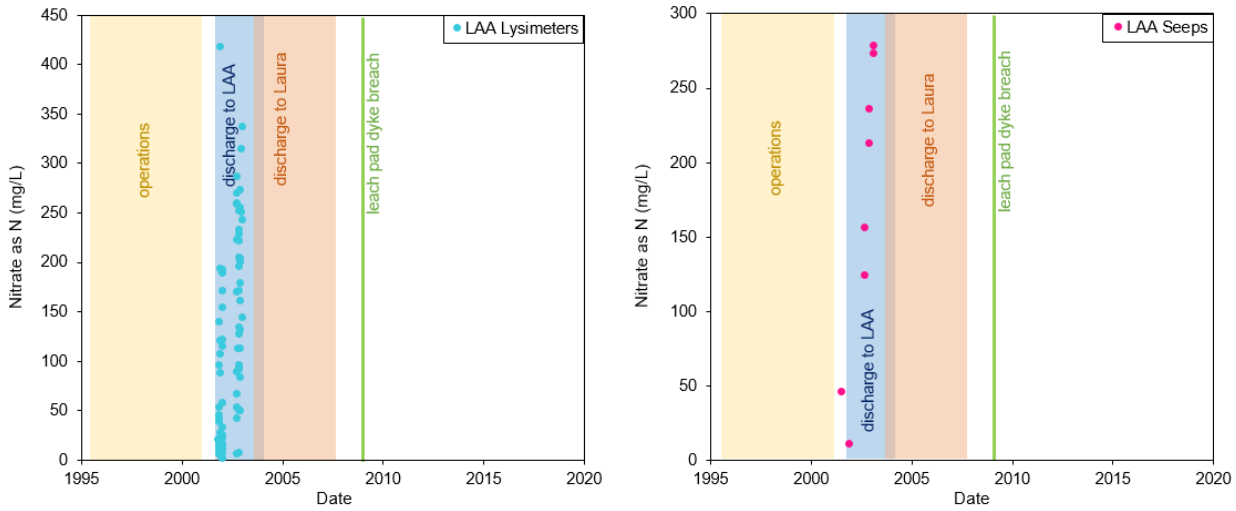

Figure 18: Nitrate as nitrogen concentrations in the Land Application Area lysimeters and seeps during discharge.

Monitoring wells

- Nitrate in BC-66-2 has been observed at concentrations that exceed, by more than an order of magnitude, all observations made in all other monitoring wells in the heap leach pad area.
    - BC-66-2 was installed in May 2002 (Viceroy Minerals Corporation 2002b). In 2003 and 2004, the maximum nitrate concentrations observed in this well were 100 mg NO_3^--N/L and 103 mg NO_3^--N/L, respectively (Figure 19). Nitrate concentrations in this well generally decreased from 2004-2009. From spring 2009 until fall 2011, nitrate concentrations in this well were relatively low (less than 3 mg NO_3^--N/L). There is a gap in the monitoring record, according to WRB's records, until spring 2013. From spring 2013 until the present, nitrate concentrations have typically exceeded 20 mg NO_3^--N/L.

- Nitrate concentrations in BC-21 were relatively high from 2001-2013 and relatively low before and after that period.
    - According to WRB's records, BC-21 has been monitored since 1996. Nitrate concentrations in BC-21 were relatively low (0.03 mg NO_3^--N/L on average and frequently not detected) from 1996-2000 and again from 2014-2019. From 2001-2013, nitrate concentrations in this well were typically elevated (by more than an order of magnitude) relative to the prior and subsequent periods (Figure 19).

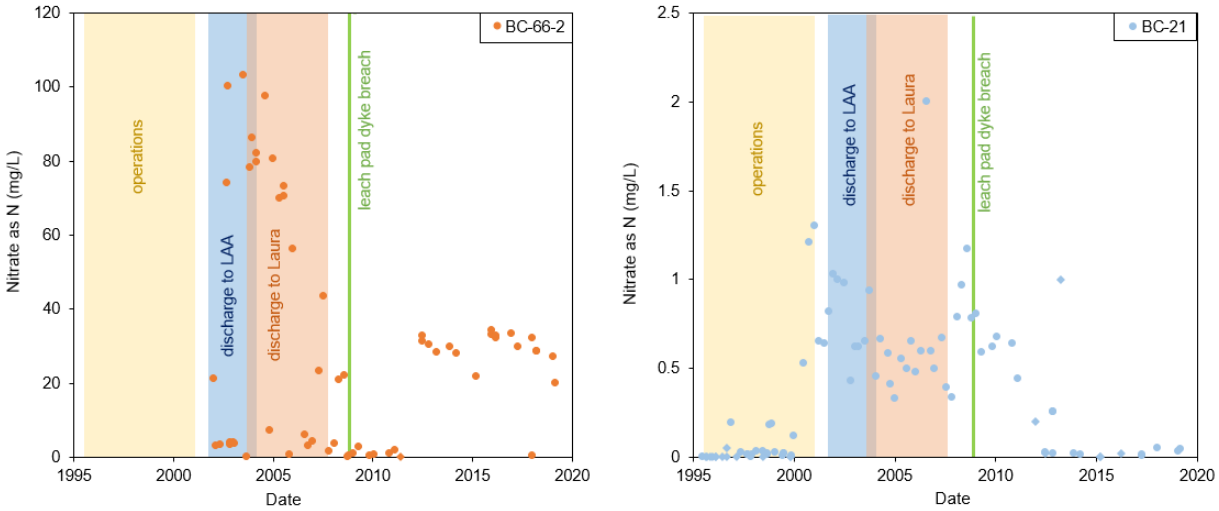

Figure 19: Nitrate as nitrogen concentrations at groundwater wells BC-66-2 and BC-21. Triangle points indicate non-detects.

- Increasing trends in nitrate concentrations are observed in BC-19 and BC-22.
    - According to WRB's records, BC-19 has been monitored since 1994. BC-19 is the shallowest water-bearing monitoring well in the vicinity of the leach pad with a total depth of 58.90 meters below top of casing (mbtoc). Nitrate concentrations in BC-19 were not observed to exceed 0.5 mg NO_3^--N/L from 1994-2016 (Figure 20). Beginning in 2017, progressively greater concentrations of nitrate have been observed in BC-19; however, nitrate concentrations in this well remain relatively low (less than 2 mg NO_3^--N/L) (Figure 20).
    - According to WRB's records, BC-22 has been monitored since 1996. BC-22 is the deepest monitoring well in the vicinity of the leach pad with a total depth of 121.00 mbtoc. (It is more than twice as deep as BC-19, which has a total depth of 58.90 mbtoc.) WRB noted during the audit in August 2019 that the lid of this well could not be closed; therefore, the well is exposed to the atmosphere. Nitrate concentrations in this well generally increased from 2001-2017 (Figure 20). There are only two nitrate concentrations in WRB's records for BC-22 since spring 2014: one in 2016 and another in 2018. In both of these more recent instances, the nitrate concentration is similar to concentrations observed prior to the increasing trend that began in approximately 2001 (Figure 20).

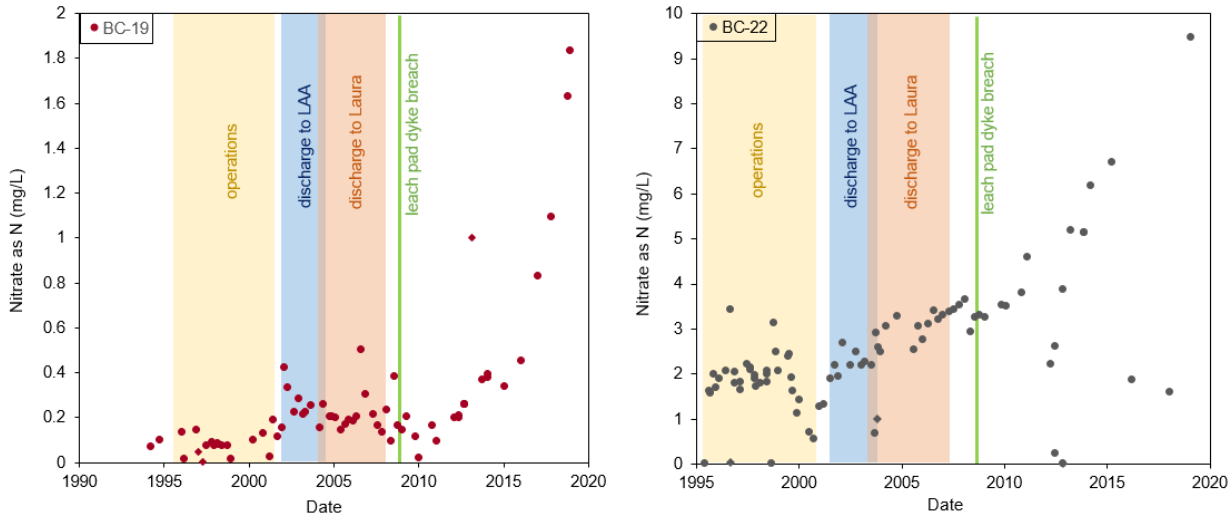

Figure 20: Nitrate as nitrogen concentrations at groundwater wells BC-19 and BC-22. Triangle points indicate non-detects.

Sulphate

- Decreasing trends in sulphate concentrations are observed in BC-22 and BC-65.
    - According to WRB's records, BC-22 has been monitored since 1996. As mentioned above, BC-22 is the deepest monitoring well in the vicinity of the leach pad with a total depth of 121.00 mbtoc. WRB noted during the audit in August 2019 that the lid of this well could not be closed; therefore, the well is exposed to the atmosphere. The maximum sulphate concentrations observed in BC-22 (frequently greater than 1,000 mg/L from 1996-1999 and as high as 10,000 mg/L in 2004) exceed all observations made in all other monitoring wells in the heap leach pad area. Two sulphate concentrations were observed in BC-22 in 2004 that appear anomalous: 8,700 mg/L (in May) and 10,000 mg/L (in June). These concentrations are nearly an order of magnitude greater than other observed sulphate concentrations in this well. Sulphate concentrations in BC-22 generally decreased by approximately half from 1996 to 2015 (Figure 21). This pattern is in contrast to nitrate concentrations observed in this well (see above). The two most recent sulphate concentrations for BC-22 in WRB's records (from 2016 and 2018) are significantly greater than concentrations observed in this well since 2004 (Figure 21).
    - BC-65 was installed in May 2002 (Viceroy Minerals Corporation 2002b). BC-65 is the second-deepest monitoring well in the vicinity of the leach pad with a total depth of 115.30 mbtoc. WRB noted during the audit in August 2019 that this well had no lid; therefore, the well is exposed to the atmosphere. Sulphate concentrations in this well decreased from 2002 to fall 2003 and continued to decrease, at a lesser rate, from then until the end of the period of record (Figure 21). WRB's records contain only one sulphate concentration at BC-65 since 2011. WRB observed that

BC-65 required repair during the site visit in August 2019. BC-65 was re-drilled in fall 2019 (personal communication with Golden Predator 2020a).

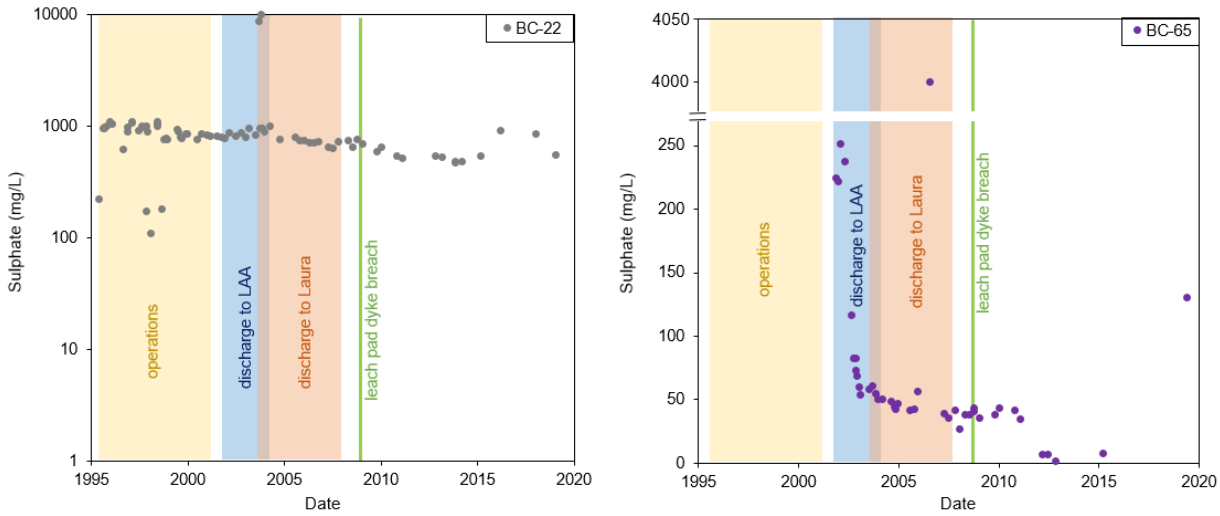

Figure 21: Sulphate concentrations at groundwater wells BC-22 and BC-65. Note break in scale for BC-65.

- Increasing trends in sulphate concentrations are observed in BC-19, BC-24, and BC-66-2.
    - According to WRB's records, BC-19 has been monitored since 1994. As mentioned above, BC-19 is the shallowest water-bearing monitoring well in the vicinity of the leach pad with a total depth of 58.90 mbtoc. Sulphate concentrations in BC-19 were not observed to exceed 200 mg/L from 1994-2011 (Figure 22). Beginning in 2013, sulphate concentrations in BC-19 have generally increased to over 600 mg/L (Figure 22).
    - WRB only has data for BC-24 from 1996-2000. Sulphate concentrations in this well generally increased (from 6 mg/L to 29 mg/L) over the period of record (Figure 22).
    - BC-66-2 was installed in May 2002 (Viceroy Minerals Corporation 2002b). Sulphate concentrations in this well generally decreased from 2004-2010 (from approximately 30 mg/L to approximately 10 mg/L) and have generally increased (from approximately 10 mg/L to approximately 40 mg/L) from 2011-2019 (Figure 22).
- Sulphate concentrations in BC-21 were relatively low from 2001-2011 and relatively high before and after that period.
    - According to WRB's records, BC-21 has been monitored since 1996. Sulphate concentrations in BC-21 generally decreased from 1,000 mg/L in 1996 to less than 50 mg/L by 2001, were relatively low (approximately 23 mg/L on average) from 2001-2011, and generally increased (to over 500 mg/L) from 2013-2017 (Figure 22). This pattern is in contrast to nitrate concentrations observed in this well (see above).

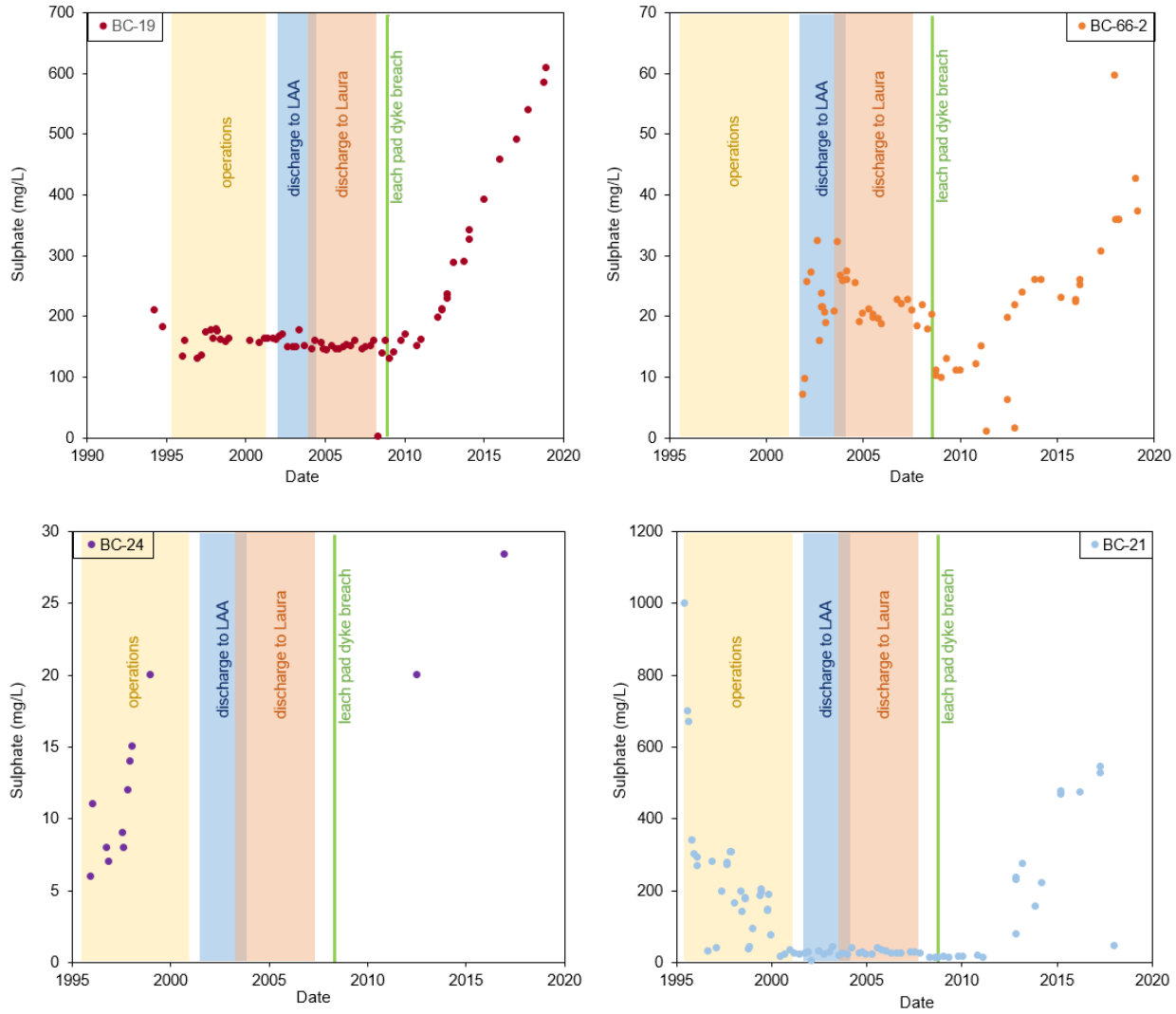

Figure 22: Sulphate concentrations at groundwater wells BC-19, BC-66-2, BC-24, and BC-21.

Antimony

- Dissolved antimony in BC-66-2 has been observed at concentrations that exceed all observations made in all other monitoring wells in the heap leach pad area.
    - Dissolved antimony in BC-66-2 has been observed at concentrations (up to 0.0447 mg/L) that exceed all observations made in all other monitoring wells in the heap leach pad area (Figure 23). Dissolved antimony concentrations in BC-66-2 have not been observed to exceed the EQS (0.5 mg/L) applicable to this location. Dissolved antimony concentrations have not been observed to exceed the CSR-AW (0.2 mg/L) at this or any monitoring well in the leach pad area.

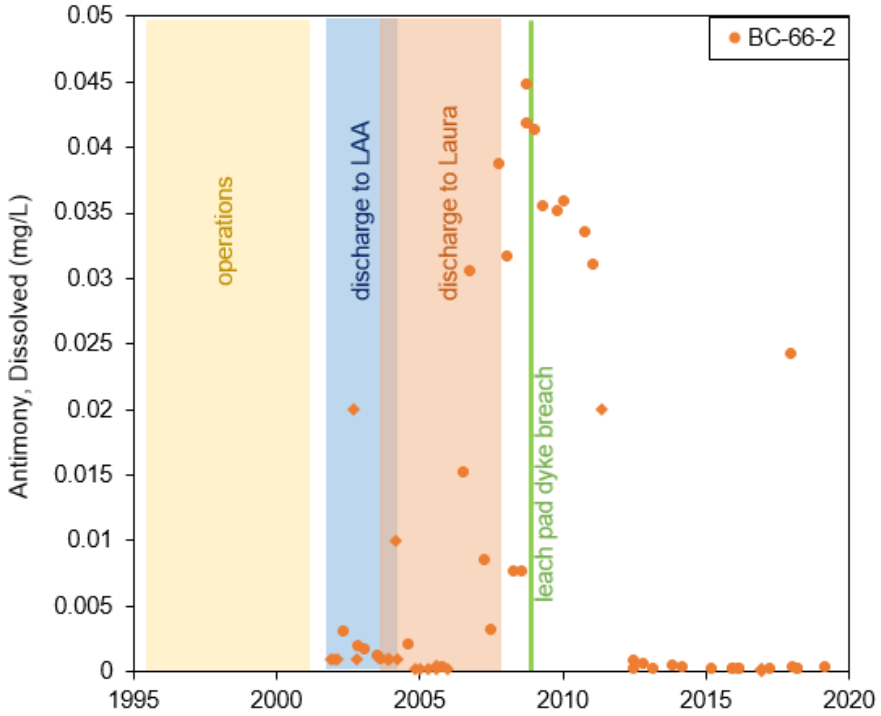

Figure 23: Concentrations of dissolved antimony at groundwater well BC-66-2. Triangle points indicate non-detects.

Arsenic

- Dissolved arsenic in BC-21 has been observed at concentrations that frequently exceed the CSR-AW and exceed all observations made in all other monitoring wells in the heap leach pad area.
    - Dissolved arsenic in BC-21 has been observed at concentrations (up to 0.912 mg/L) that exceed all observations made in all other monitoring wells in the heap leach pad area (Figure 24). Dissolved arsenic in BC-21 frequently exceeded the CSR-AW (0.05 mg/L) and generally decreased from 1996-2001 (Figure 24). Since that time, dissolved arsenic in BC-21 has not been observed to exceed the CSR-AW, although concentrations were relatively elevated from 2012-2017 (Figure 24). This general pattern of concentrations resembles that of sulphate in this well (see above).

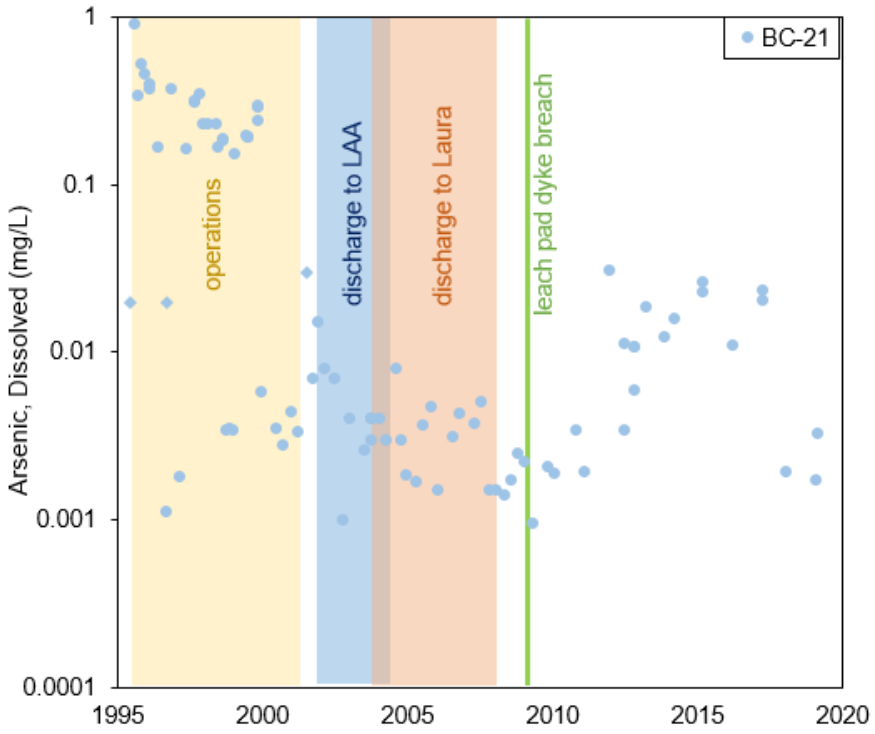

Figure 24: Dissolved concentrations of arsenic at groundwater well BC-21.Triangle points indicate non-detects.

Selenium

- Dissolved selenium has been observed at concentrations that frequently exceed the CSR-AW in various groundwater monitoring wells in the heap leach area.
    - Based on WRB's records, selenium concentrations in BC-19 since 2012 exceed any previously observed selenium concentration in this well; however, they have not been observed to exceed the CSR-AW. Selenium concentrations in BC-19 averaged 0.0019 mg/L from 1994-2011 and averaged 0.0061 from 2012-2019 (a more than threefold increase; Figure 25).
    - Selenium concentrations in BC-21 frequently exceeded the CSR-AW from mid-1999 until mid-2008 but have not exceeded the CSR-AW since that time (Figure 25).
    - The maximum dissolved selenium concentrations observed in BC-22 (up to 0.14 mg/L) exceed all observations made in all other monitoring wells in the heap leach pad area and have almost always exceeded the CSR-AW. Dissolved selenium concentrations in BC-22 generally decreased from about 2005 to 2018 (Figure 25).
    - Dissolved selenium concentrations in BC-66-2 have not been observed to exceed the EQS (0.3 mg/L); however, they frequently exceeded the CSR-AW (0.01 mg/L) from late-2002 until mid-2008 (Figure 25). From that time until December 2011, selenium concentrations in this well did not exceed the CSR-AW (Figure 25). There

is a gap in the monitoring record, according to WRB's records, until January 2013. From 2013 to present, selenium concentrations have typically exceeded the CSR-AW (Figure 25). This general pattern of concentrations resembles that of nitrate in this well (see above).

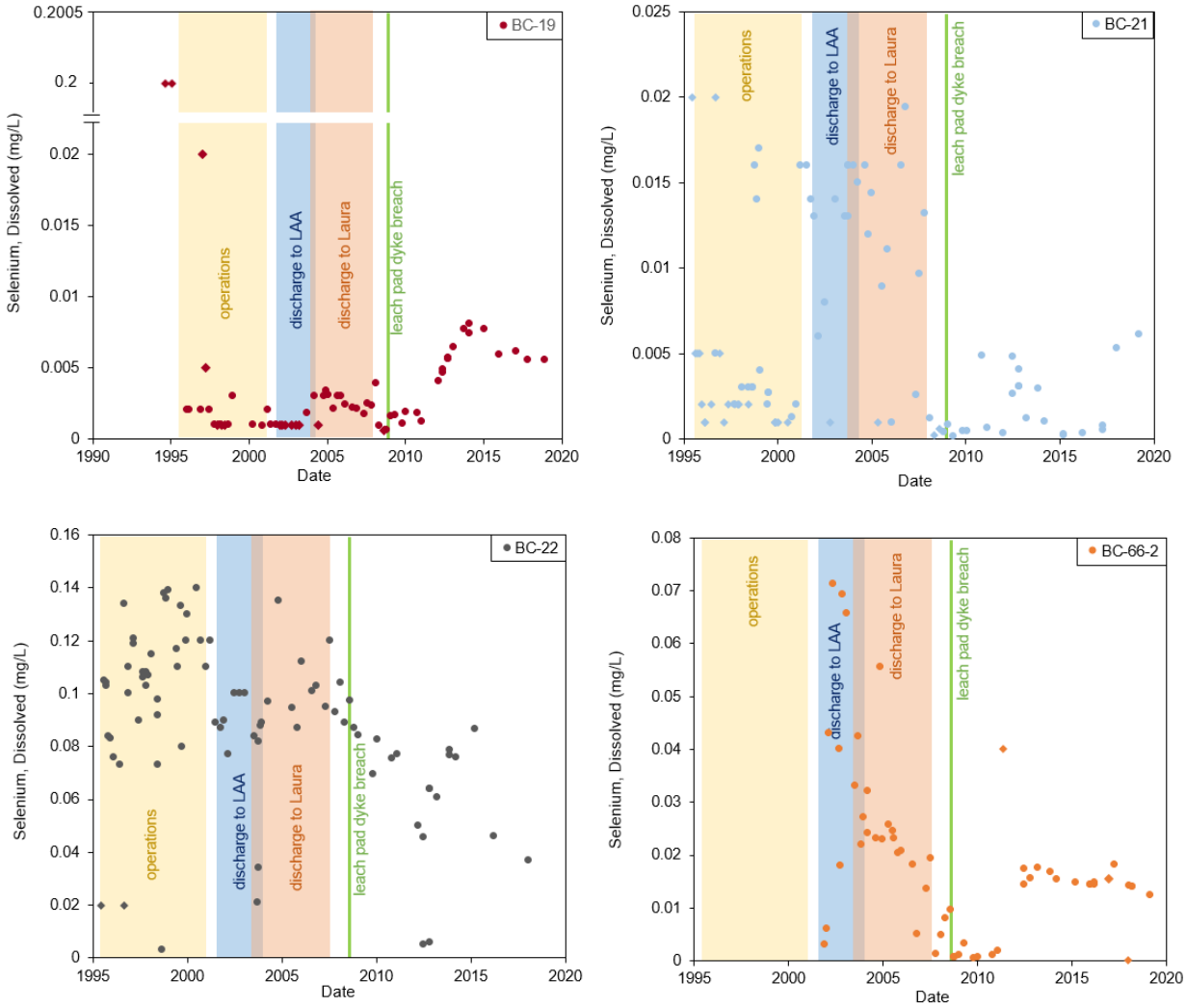

Figure 25: Dissolved concentrations of selenium in groundwater wells BC-19, BC-21, BC-22, and BC-66-2. Note break in scale at BC-19. Triangle points indicate non-detects.

Discussion

Groundwater influenced by the key features in the leach pad area could potentially discharge to Carolyn Creek in less than one year

Caution should be applied when interpreting groundwater flow and transport in fractured rock using methods that are traditionally used for characterizing porous media aquifer systems. The hydraulic properties of fractured rock aquifers are typically highly heterogeneous (which means that hydraulic conductivity, and hence groundwater flow rate, can be extremely spatially variable) and anisotropic (which means that hydraulic properties may have different values when measured in different directions). The aquifer underlying the leach pad area may behave as an equivalent porous medium at a sufficiently large scale (such as, perhaps, the scale of Carolyn Creek) but WRB anticipates significant heterogeneity and anisotropy at the scale of any given well. Methods designed for interpreting groundwater flow and transport in fractured rock aquifers require information on fracture dimensions (aperture, length, width), location (orientation, spacing), and other characteristics (surface roughness). As far as WRB is aware, none of this information is available for the subject fractured rock aquifer.

Recognizing inherent heterogeneity, anisotropy, and uncertainty, the average linear flow velocity of groundwater in the bedrock aquifer in the area of the leach pad is relatively fast and mining infrastructure is relatively close to Carolyn Creek (in the range of 1-2 km). Based on the upper range of estimates of the average linear flow velocity of groundwater in the bedrock aquifer, it is possible that groundwater impacted by the leach pad, process ponds, and/or LAA could discharge to Carolyn Creek in less than one year. Using the upper range of estimated average linear flow velocity of groundwater in the bedrock aquifer is a conservative approach that considers that the groundwater monitoring wells that yielded the greatest hydraulic conductivities when tested may be wells that intersect fractures that may be significant conduits for groundwater flow and solute transport in the bedrock aquifer.

The travel time can be directly measured by considering the discharge of heap effluent to the LAA as an injected tracer test. The land application system was commissioned in July, 2002. In May 2003, less than one year following the discharge of heap effluent to the LAA, the nitrate concentration at BC-2 was approximately one thousand times the pre-discharge mean nitrate concentration at that location and the CCME WQG-PAL for nitrate was exceeded in Carolyn Creek for the first time on record.

BC-21 is not likely representative of background groundwater quality

As mentioned above, BC-21 is shown to be upgradient of the leach pad in an area with no significant horizontal hydraulic gradient towards the well (Figure 16). This implies no significant horizontal groundwater flow towards the well. The well is located on a topographic high and on a potentiometric high (Figure 16) where downward, vertical groundwater flow likely dominates horizontal groundwater flow. Therefore, the well is intrinsically vulnerable to surficial

contamination. The capture zone of the well is likely in an area that has been disturbed. Therefore, the well is not located in an area that is likely representative of background groundwater level and quality. The variability in groundwater quality in BC-21 (discussed above) is not likely representative of background groundwater quality and warrants further investigation as part of a comprehensive geochemical and water quality assessment for the Brewery Creek mine (WRB's recommendation 1).

Discharge to the Land Application Area likely caused a groundwater "mounding effect" and resulted in radial or divergent flow from the Land Application Area

A contour map of the potentiometric groundwater surface for the period during which heap effluent was discharged to the LAA (2002-2004) would provide insight into flow directions and hydraulic gradients during that period. WRB cannot conduct this analysis because we do not currently have groundwater level data prior to 2012 for the relevant portion of the site. Groundwater level data prior to 2012 for the relevant portion of the site are not presented in the Updated Baseline Hydrogeology Assessment (Tetra Tech 2016).

WRB assumes that the discharge of heap effluent to the LAA resulted in a local groundwater mounding effect in the vicinity of the LAA, which would cause radial (or at least divergent) flow away from the LAA. This effect could potentially convey groundwater impacted by the heap effluent to wells in the monitoring network that are shown to be crossgradient of the LAA in Figure 16 (i.e. Tetra Tech's interpretation of groundwater flow directions; Tetra Tech 2016). This would account for the pattern of nitrate concentrations observed at BC-66-2 and discussed above.

Water quality in downgradient surface water and crossgradient groundwater changed during effluent discharge to the Land Application Area

WRB hypothesizes that the discharge of effluent to the LAA caused elevated concentrations of nitrate, cyanide and selenium in groundwater immediately downgradient of the LAA and in Carolyn Creek. WRB acknowledges that past discharge of effluent to the LAA was conducted in compliance with the licensee's water licence. Understanding the impacts of past discharge of effluent to the LAA is important because:

1. Golden Predator is licensed to continue discharging effluent to the LAA, subject to the terms and conditions of their water licence.
2. In order to understand other potential impacts to groundwater and surface water quality from sources other than the LAA (including, potentially, infiltration from the process ponds and the area surrounding the perimeter of the heap leach pad), the past responses (magnitude and duration) in receiving waters to discharge to the LAA needs to be fully understood.

WRB's hypothesis is based on the timing and magnitude of water quality changes observed in downgradient surface water and crossgradient groundwater corresponding with the discharge to the LAA. Nitrate, cyanide, and selenium in this case are seen as tracers of effluent from the LAA. Nitrate in unimpacted watercourses is rarely found to exceed 1mg NO_3^--N/L (CCME 2012), cyanide is not naturally found at this site therefore must originate from the heap leach facility, and although selenium concentrations are naturally elevated on site, elevated concentrations above pre-discharge concentrations indicate a potential influence from effluent discharge.

Following the path from the heap to downgradient receiving waters, elevated concentrations of nitrate from heap-derived water can be observed travelling through groundwater and eventually to surface water that correspond with the timing of discharge to the LAA:

- Heap water (BC-28) during the period in which heap water was discharged to the LAA (2002-2004) was in the range of 55 - 425mg NO_3^--N/L with an average of 274mg NO_3^--N/L.
- Lysimeters installed at various depths in the LAA during the discharge period showed concentrations similar to those found in heap water (range = 1.1 - 418mg NO_3^--N/L; mean = 124mg NO_3^--N/L).
- Seepage at the toe of the LAA during the discharge period showed average concentrations of nitrate collected between 2002 and 2003 (n = 8) of 167 mg NO_3^--N/L with a range of 10.6 - 278 mg NO_3^--N/L.
- Groundwater immediately downgradient of the LAA (BC-66-2) showed elevated concentrations in the range of 0.05 - 103mg NO_3^--N/L with a mean of 33mg NO_3^--N/L during the discharge period. Concentrations remained elevated for some time after discharge to the LAA ceased.
- Carolyn Creek (BC-2) exhibited a response during, and for some time following, the discharge period. During discharge to the LAA, concentrations rose above previously observed concentrations to a maximum of 95.3mg NO_3^--N/L in August 2004 with an average concentration of 20mg NO_3^--N/L during the discharge period.

A similar trend was observed with cyanide and selenium. The timing of cyanide and selenium in Carolyn Creek corresponds with the discharge period to the LAA. Cyanide rose sharply from pre-discharge concentrations (mean = 0.0096mg/L) in Carolyn Creek to a maximum of 0.245mg/L in September 2003. Selenium likewise rose from an average of 0.0038mg/L prior to discharge to 0.11mg/L in May 2003 (see Figure 14). The sharp increase of cyanide, selenium and nitrate corresponding with the timing of discharge to the LAA support the hypothesis that the effluent caused changes to surface and groundwater quality at BC-66-2 and BC-2.

This interpretation is consistent with the groundwater flow direction presented in the Updated Baseline Hydrogeological Assessment (Tetra Tech 2016) and the upper range of estimated average linear groundwater flow velocities. Additionally, seeps were observed at the toe of the LAA during discharge (Viceroy Minerals Corporation 2003a and 2004a). Surficial flow of

effluent during discharge may have also resulted in expedient flow of effluent reporting to downgradient receiving waters.

WRB hypothesizes that the effects of the discharge of effluent to the LAA had largely diminished in the monitoring well most significantly impacted by the discharge (BC-66-2) and in Carolyn Creek (BC-2) as of approximately 2009. As apparent in figures 10, 11, 15, 19, and 20, concentrations of nitrate, cyanide and selenium in BC-19, BC-66-2, BC-2 and BC-3 decreased significantly, which WRB believes to indicate the cessation of effects of effluent discharge on receiving waters.

The observations discussed above indicate that nitrate (and to some degree cyanide and selenium) were not attenuated sufficiently to avoid changes in water quality downgradient of the LAA. Although Golden Predator is licensed to discharge to the LAA, we recommend Golden Predator undertake further studies on attenuation capacity and potential impacts to downgradient receiving water should Golden Predator want to use the LAA for effluent discharge. Alternative treatment options should also be considered for any future discharges.

Other Sources of Nitrate

It is recognized that there are several potential sources of nitrate surrounding the heap leach pad area. The following describes how other potential sources do not explain WRB's observations in downgradient receiving water during land application.

Nitrate concentrations prior to discharge were lower in surface and groundwater compared to during and after discharge to the Land Application Area

Although no baseline data was available at the time of writing, groundwater wells BC-19 and BC-66-2 and surface water stations BC-2 and BC-3 with pre-discharge data were lower in concentration in comparison to post-discharge concentrations. At BC-2 and BC-3, average concentrations of nitrate prior to July 2002 when effluent was discharged to the LAA was 0.02mg NO_3^--N/L and 0.1mg NO_3^--N/L, respectively. After discharge commenced, concentrations markedly rose to nearly 95.3mg NO_3^--N/L and 3.6mg NO_3^--N/L for BC-2 and BC-3, respectively. Likewise for groundwater well BC-19, average concentrations were 0.08mg NO_3^--N/L prior to discharge to the LAA, and peaked to 0.42mg NO_3^--N/L shortly thereafter. Although there is no data prior to discharge for groundwater well BC-66-2 (record starts August 2002), concentrations began to rise in the well in May 2003 to 74mg NO_3^--N/L, peaking up to 103mg NO_3^--N/L during the discharge period. The changes in water quality in downgradient receiving waters indicate that these changes are likely due to the release of effluent.

The 2004 regional forest fire occurred after elevated nitrate was observed in Carolyn Creek

In 2004, there was a forest fire south of the heap leach facility at the lower portion of Carolyn and Laura creeks (Figure 2). Forest fires have shown to increase nitrate concentrations in water bodies, usually as a short-term spike in concentrations however may be elevated for several

years following the fire (Rhoades et al. 2011, Brass et al. 1996, Spencer and Hauer 1991). The fire downgradient of the heap likely contributed nitrate to both Carolyn and Laura creeks however the marked increases were observed prior to the fire. Discharge to the LAA commenced in July 2002 and subsequently a spike in nitrate concentrations was first observed at BC-2 in July 2002 (5 times pre-discharge concentrations; 0.0095mg NO_3^--N/L) followed by the first exceedance of CCME WQG-PAL observed in May 2003 (21mg NO_3^--N/L). Therefore, since the elevated nitrate concentrations were observed prior to the 2004 forest fire, WRB believes the forest fire could not have contributed nitrate to Carolyn Creek prior to 2004, however the fire likely contributed additional nitrate after 2004.

The septic system does not report to Carolyn Creek and was predicted to not impact water quality

Septic systems are designed to treat sewage through settling and anaerobic processes in a septic tank, followed by dispersion through an absorption field for further treatment. Figure 2 shows the location of the current and abandoned absorption fields to treat camp sewage, based on Figure 1 of Exhibit 1.7 of the water licence application. The location of these fields are located within the Pacific Creek catchment and therefore should not contribute nitrate to the Carolyn Creek catchment. Groundwater in the area of the septic system is anticipated to flow to the north towards an unnamed tributary of Pacific Creek (Figure 2). This interpretation is consistent with Exhibit 1.7 of the application for MN12-038 (see the figure associated with the Application for a Permit to Install a Private Sewage Disposal System). The system is a potential source of nitrate (among other chemical constituents); however, in Exhibit 1.2 of the water licence application, the applicant (Golden Predator) stated that "*There will be no impact to water quality/quantity and rate of flow*" (s. 43 under part G (Project Effects)).

Fertilizer applied to the heap cover in 2003 does not contribute significant nitrate to the Carolyn Creek catchment

During reclamation in 2003, fertilizer was applied to revegetated areas around the mine site such as the heap leach pad cover, the Blue waste rock storage area cover, and other waste rock storage areas and pits. Fertilizer is a source of nutrients for plant growth including nitrogen, phosphorus, and potassium. It is difficult to ascertain exactly how much nitrogen could have reported to surface or groundwater since it is dependent on the type of fertilizer used, the soil composition, plant uptake, the timing of application, and the timing and amount of precipitation. However, estimates of fertilizer application and precipitation was used to calculate potential nitrogen contribution to the heap/Carolyn Creek.

According to Viceroy Minerals Corporation (2003c), 300kg per hectare of fertilizer was applied during reclamation in 2002 to 2003. Based on the 2003 annual report, 34.1 hectares of the heap was revegetated (and assumed to be fertilized) in 2003 which is the only component within the Carolyn creek catchment that was revegetated. This totals approximately 10,230kg of fertilizer. Fertilizers normally contain up to 20% nitrogen, which is approximately 2,046kg nitrogen. The average yearly precipitation on the heap (minus sublimation) is 101,231m^3 (derived from values presented in EBA 2012). Therefore, if all the nitrogen reported to the heap

and/or Carolyn Creek in one year (assuming no plant uptake), a concentration of 20.2 mg/L of nitrogen would have been added. Since the heap-derived water contains upwards of 400mg NO_3^--N/L and groundwater well BC-66-2 showed upwards of 100mg NO_3^--N/L, it is not believed that fertilizer application is the main source of nitrate in the heap or in downgradient surface water and groundwater.

Water quality in the heap and surrounding surface water and groundwater has changed over the last decade

Over the last decade, water quality is changing in the heap and surrounding surface water and groundwater. In the heap, nitrate concentration continue to remain elevated and variable, and antimony and sulphate concentrations are increasing. In the receiving water environment, increasing concentrations of sulphate and nitrate are apparent in groundwater (BC-19 and/or BC-66-2), and nitrate concentrations in Carolyn creek (BC-2) in 2019 are the highest observed since 2009. These observed changes are not likely related to the discharge of effluent to the LAA from 2002-2004.

WRB hypothesizes that changes in water quality in surface and groundwater downgradient of the heap in the last decade are attributed to infiltration of heap water to ground. In 2008 the pond liners were removed and in 2009 the heap dyke was breached allowing for heap/pond water to infiltrate to ground. Since then, changes in water quality have been observed in the downgradient receiving water environment.

Since the heap is free-draining, heap water containing elevated concentrations of sulphate, antimony, and nitrate is infiltrating to ground and resulting in elevated concentrations of sulphate and nitrate not previously observed in downgradient groundwater (i.e. BC-19 and/or BC-66-2). Antimony is not observed to be increasing in groundwater, possibly due to attenuation along the subsurface flow path. In August 2019, nitrate exceeded CCME WQG-PAL's in Carolyn Creek (BC-2; 3.59 mg NO_3^--N/L) for the first time since 2009. WRB contends this recent increase in nitrate may be indicative that water from the heap is reaching Carolyn Creek. Sulphate and antimony concentrations have not increased recently in Carolyn Creek, which may be due to attenuation along the flow path from the heap. The precise pathway from the heap to groundwater and surface water is unclear.

If concentrations of sulphate and antimony continue to increase and nitrate remains elevated in the heap, it is hypothesized that a similar trend may be observed in groundwater and surface water in the future so long as the heap continues to drain freely to ground. The recent increases observed in groundwater and surface water downgradient of the heap may be indicators of future further increases in these receiving watercourses.

Future considerations and recommendations

Water Quality Objectives and Effluent Quality Standards

Water Quality Objectives (WQOs) are thresholds of acceptable water quality conditions in receiving waters that may be affected by a project. While EQS are the maximum allowable concentration or level of contaminant that can be released to the environment in effluent, EQSs are developed to achieve WQOs in receiving waters. EQSs should consider the dilution available in the receiving environment, the portion of the assimilative capacity that may be allocated to a specific discharge, and the extent of acceptable mixing zones.

Both EQS and WQO development requires a thorough understanding of relevant environmental conditions. Therefore, it is important to ensure that available data and monitoring is sufficiently robust to document natural variability on site. If operations at Brewery Creek mine recommence, both EQSs and WQOs in both surface and groundwater should be reviewed to ascertain whether they are protective of the receiving environment. Current conditions versus pre-mining conditions should be considered as water quality may have changed since pre-mining in the early 1990's. Figure 11 illustrates this possibility, as concentrations of nitrate appear to be different from 1996 to current concentrations at downgradient station BC-2. However, due to limited recent data, the variability of nitrate at this station is unclear. Additional data will be required to ascertain water quality variability to develop updated EQSs and WQOs.

The methods to derive WQOs and EQSs have also evolved since the licence EQSs were first developed and therefore EQSs and WQOs should be reviewed and potentially revised. A review of the current WQO for selenium is discussed below.

Additionally, it is noted that there are no EQSs or WQOs for nitrate and sulphate. Due to the observed concentrations in the heap and in downgradient receiving waters, WQOs and EQSs are recommended to be developed for nitrate and sulphate.

Monitoring

Frequency

As discussed above, sufficient current data is important in anticipation of future mining and monitoring potential adverse trends in water quality. Since the mine has been in closure, the monitoring schedule is at an annual sampling frequency. However, recently the Golden Predator has increased monitoring to a monthly frequency for surface water and quarterly for groundwater. It is recommended to continue this frequency of monitoring to provide for a robust dataset that can be used to assess trends and develop WQOs and EQSs. Additionally, to understand the natural variability during times of high variability (i.e. spring freshet), it is recommended to conduct 5 sampling events in 30 days.

Reporting parameters

In addition, un-ionized ammonia should be added to the monitoring/reporting schedule for downgradient surface water and groundwater stations in the Laura Creek watershed. Un-ionized ammonia is more toxic to aquatic life than the ammonium ion.

Locations

Surface water upstream of the existing stations on Carolyn and Laura Creek (BC-2 and BC-3) should be monitored. BC-32 on Laura Creek (located halfway upstream Laura, near the lower fosters pit) should be monitored as an upstream station to compare with downstream monitoring stations. However, impacts to the creek above this station should be confirmed to ensure it is in fact unimpacted because it is just downgradient of waste rock pits.

Based on the water licence monitoring schedule, groundwater wells BC-20, BC-23, BC-24, and BC-25 are not required to be monitored by the Golden Predator. WRB reviewed its records and found groundwater quality data from 1996-2003 for BC-20 and BC-23, 1996-2000 for BC-24, and 1996-1997 for BC-25. If these wells have not been decommissioned and are in working condition, WRB recommends that Golden Predator monitors them at the same frequency as the other wells in the leach pad area to detect potential effects from the heap leach facility. If the wells are not functional, they should be repaired or replaced.

Station deficiencies

There are two monitoring wells on site that need to be repaired: BC-22 and BC-67. Both wells do not have lids, which is important to prevent contaminants from entering the wells. BC-22 may have been affected by frost heaving processes that pushed the PVC screen and riser upward above the metal stickup protection monument. This results in the lid not covering the well opening. This well should be repaired (i.e. cut the PVC riser to below the metal monument). During the audit, WRB noted that BC-65 also required repair but WRB now understands that monitoring well BC-65 was re-drilled in fall 2019 (Golden Predator 2020b).

Many of the surface water stations had a staff gauge present, however many appear to be old and need to be replaced or adjusted. This is likely due to freeze and thaw processes and lack of regular maintenance. The staff gauges at stations BC-31, BC-5, require fixing as monitoring of flow is required under water licence QZ96-007, however all staff gauges should be evaluated and fixed if not functioning.

Adaptive Management Plans

The most recent Adaptive Management Plan (AMP) (Viceroy Minerals Corporation 2004b) consists of several actions as it relates to selenium concentrations in heap-derived water and downgradient receptors. The adaptive management strategy is to monitor selenium at BC-53 (see Figure 26) to guide the implementation of response measures, with triggers as follows:

- Threshold #1: Total selenium water quality at BC-1 of 3.8 ug/L <= 2 standard deviations of the historical baseline data as determined at BC-1 (2 x STD = 2.0 ug/L); and

- Threshold #2: Total selenium water quality at BC-1 of 3.8 ug/L > 2 standard deviations of the historical baseline data as determined at BC-1 (2 x STD = 2.0 ug/L).

Responses to exceedances of thresholds is a series of actions aimed at verifying analytical results through sample verification, re-sampling, increased sample frequency, and additional monitoring. This approach is to ensure that the site-specific water quality objective (SSWQO) at BC-39 is met, as required in water licence QZ96-007.

The AMP could be more comprehensive as the thresholds described above lack clarity and should be refined, i.e. is 2.0ug/L representative of 2 standard deviations from 3.8ug/L? Additionally, the location of BC-39 as a SSWQO station may need to be re-evaluated to determine the appropriateness for capturing mining effects before entering into the South Klondike River. Where Laura Creek reports to South Klondike River is not clear as the water flows through a vast wetland area. The creek might lose surface flow and/or develop various channels. Wetlands do provide filtration and support attenuation of metals, but the final point(s) of control should be sampled. Therefore, the location of BC-39 and the flow path of lower Laura Creek should be re-evaluated.

Additionally, as outlined in the 2016 Laura Creek Impact study, water quality at BC-39 exceeded the CCME WQG-PAL for total aluminum, arsenic, chromium, copper and iron. It is recognized baseline conditions may be elevated naturally at times, however if these parameters are consistently exceeding guidelines and may become elevated by current or historical mining activities, WQOs should be developed and incorporated into a revised AMP.

Selenium Site-Specific Water Quality Objective

As described in the 2004 AMP, a SSWQO for selenium was developed for receiving water station BC-39 in lower Laura Creek near the South Klondike River (see Figure 26). A SSWQO was developed due to naturally high concentrations of selenium (above the CCME WQG-PAL of 1ug/L) present in the watershed (average 2.34ug/L; (Viceroy Minerals Corporation 2003d)). The SSWQO was derived from the Van Derveer and Canton (1997) equation as used by Cominco for the Kudz Ze Kayah project. This equation is based on an empirical regression model of dissolved-to-sediment transfer based on data from the Arkansas River Basin. The site-specific selenium calculation requires the input of selenium in sediments, water-borne selenium and TOC. Brewery Creek mine data from 2002 was used to develop the equation and the No Observed Effects Level (NOEL) for selenium in sediments of 3.5 ug/g was used as determined by Cominco. The equation is:

log Cs = log (Cd x f0) 0.376 + 0.258

where: Cs = sediment Se in ug/g dry weight
Cd = dissolved water borne Se in ug/L
f0 = sediment total organic carbon (TOC) in % dry weight

As a result, the site-specific maximum allowable total selenium concentration is 3.8 µg/L at BC-39.

The basis of the equation is based solely on TOC values from two data points in 2002 and multiple stations and dates from 2002 for selenium values. As indicated in the AMP (2004), "As additional water quality and sediment monitoring data is collected, the Brewery Creek regression equation will continue to be calibrated and updated using current monitoring data." WRB recommends revising the methodology used to derive the SSWQO to reflect the updated data and methods. WRB recommends using a method supported by the 2007 CCME protocol for the derivation of water quality guidelines (CCME 2007).

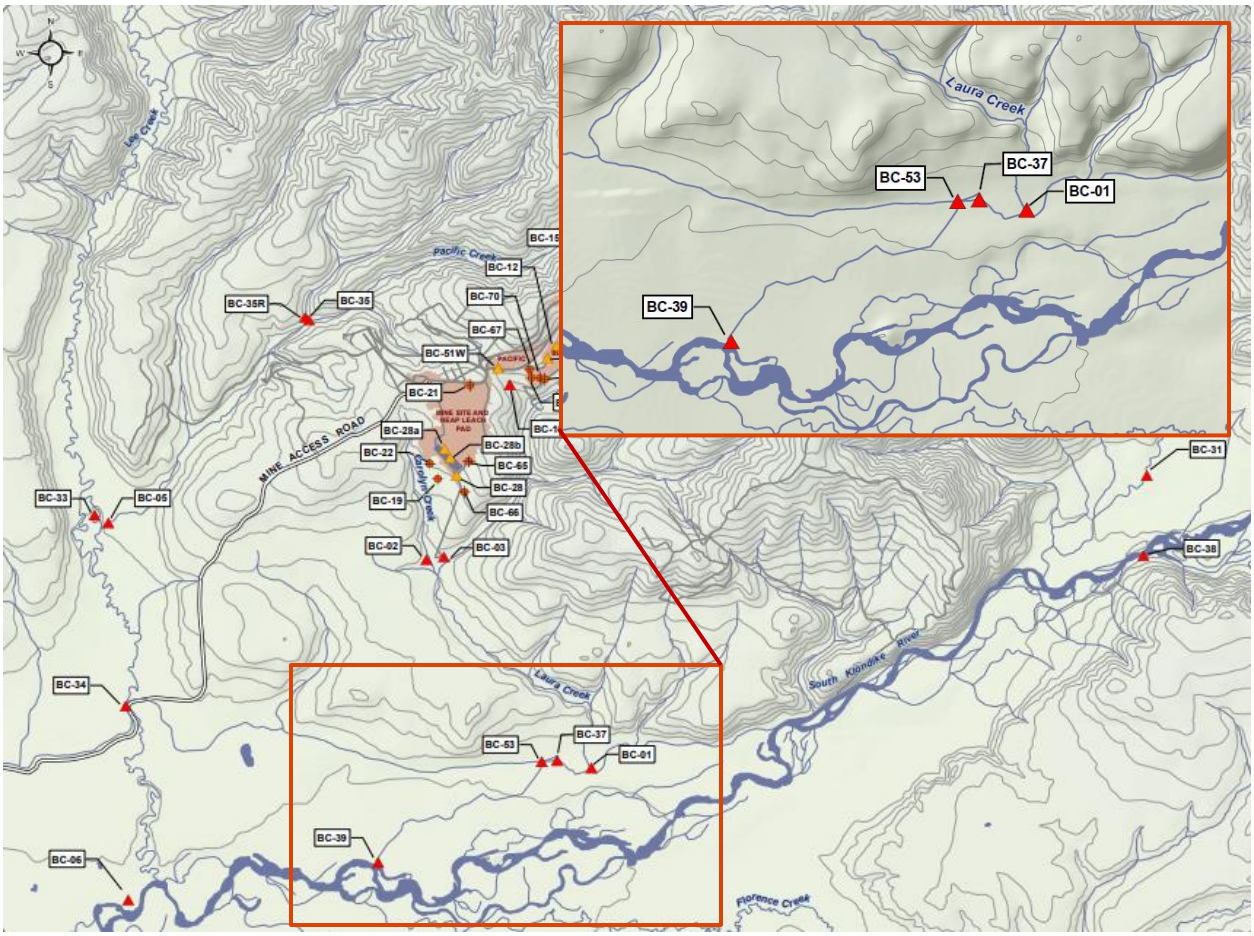

Figure 26: Water quality monitoring stations in lower Laura Creek.

Conclusions

The following key conclusions are drawn from the interpreted results:

- Samples collected during the August 2019 visit are compliant with Effluent Quality Standards and Water Quality Objectives
- Total cyanide concentrations in heap water (BC-28a) are low and continues to decline since the commencement of detoxification of the heap in 2002
- Nitrate concentrations are high and variable in heap water (BC-28a). High nitrate concentrations are presumed to be caused by the degradation of cyanide to nitrate during detoxification and are expected to remain high in the near future
- Sulphate and antimony concentrations in heap water (BC-28a) have increased since around 2006. The increases are presumed to be caused by oxidation of the ore and neutral mine drainage in the heap
- Concentrations of nitrate are recently elevated above protection of aquatic life guidelines in downgradient surface water Carolyn Creek
- Concentrations of nitrate and sulphate are increasing in groundwater downgradient of the heap
- WRB hypothesizes that changes in water quality in groundwater and surface water downgradient of the heap in the last decade are attributed to infiltration of heap water to ground due to pond liner removal and the approved heap dyke breach
- Although the discharge of heap effluent to the LAA in 2002-2004 was compliant with licence conditions; WRB contends this caused an increase in concentrations of nitrate, cyanide, and selenium in downgradient groundwater and surface water. It is believed that the effects of the discharge of heap effluent to the LAA on receiving waters had largely diminished by 2009.

Recommendations

The following technical recommendations are for consideration by Golden Predator. These recommendations do not take into consideration regulatory or compliance matters.

Recommendation #1: Golden Predator should conduct a comprehensive geochemical and water quality assessment for the Brewery Creek mine.

Rationale: The results and observations presented in this report demonstrate that there are elevated concentrations of sulphate, antimony, and nitrate in heap water that may hypothesized to report to downgradient surface water and groundwater. However, there are still many uncertainties surrounding the true source and the fate of these parameters presently and in the future. To date, there is little available documentation necessary to understand and describe flow paths of heap-derived water to the receiving environment consistent with deficiencies noted in the EBA 2011 report. Golden Predator should further investigate groundwater flow paths and sources water quality parameters elevated in concentration to ensure heap-derived waters are not impacting the downgradient receiving environment. It is recommended for the scope of the assessment to be developed in collaboration with WRB.

Recommendation #2: Although Golden Predator is licensed to discharge to the LAA, we recommend Golden Predator undertake further studies on attenuation capacity and potential impacts to downgradient receiving water should Golden Predator want to use the LAA for effluent discharge. Alternative treatment options should also be considered for any future discharges.

Rationale: The LAA was previously used to treat effluent through natural attenuation of metals/metalloids and nutrients. Clause 66 in water licence QZ96-007 states that effluent may be discharged up to 400,000m^3 during the term of the licence. To date, Golden Predator may discharge to the LAA subject to the terms and conditions of their water licence.

WRB hypothesizes that the discharge of effluent to the LAA caused elevated concentrations of nitrate, cyanide and selenium in groundwater immediately downgradient of the LAA and in Carolyn Creek. WRB's hypothesis is based on the timing and magnitude of water quality changes observed in downgradient surface water and crossgradient groundwater corresponding with the discharge to the LAA. During land application, there were marked increases in crossgradient groundwater and downgradient surface water that are attributed to the elevated concentrations observed within heap water. Nitrate is not observed in high concentrations (up to 100 mg NO3—N/L) in unimpacted waters and is preseumed to be sourced from the heap. Additionally, the increase in cyanide concentrations during the timing of discharge to the LAA indicates that heap-derived water was reporting to Carolyn Creek.

These observations indicate that nitrate (and to some degree cyanide and selenium) were not attenuated sufficiently to avoid changes in water quality downgradient of the LAA. If in the future there is intent on reusing the LAA, Golden Predator should test the effectiveness of attenuation of metals, nitrate and sulphate and identify the potential for impacts to the receiving environment. If not successful, alternative options for effluent treatment should be considered.

Recommendation #3: Golden Predator should review and potentially revise currently licenced EQS and WQOs in consideration of receiving environment water quality findings contained herein. WQOs and EQSs should be derived for nitrate and sulphate and potentially other parameters.

Rationale: Due to recent changes in water quality in the heap, and in downgradient groundwater and surface water, EQSs and WQOs should be reviewed to ascertain whether they are protective of the receiving environment. Nitrate and sulphate are currently not regulated parameters under the water licence QZ97-007, therefore WQOs and EQSs should be derived for nitrate and sulphate, and potentially other parameters that have to potential to impacts receiving waters.

Additionally, the SSWQO for selenium at BC-39 is based on data from 2002 and a regression equation methodology from 1996. The SSWQO derived in 2003 may not be appropriate for future conditions on site. Therefore the methodology of deriving the SSWQO should be revisited and potentially revised to reflect updated data and methods.

Recommendation #4: Golden Predator should update the Adaptive Management Plan under the current license to include increased clarity and detail on triggers and actions.

Rationale: The most recent AMP is from 2004 and therefore many aspects should be updated to reflect new information available and associated risks. The 2004 AMP also only addresses selenium as a concern, however based on current methods of EQS development, it is necessary to develop WQOs first before EQSs can be derived. Lastly, AMPs should describe in detail how potential risks will be mitigated and monitored in the event of adverse water quality conditions. There should be multiple action levels (low, medium, high) with corresponding trigger(s) to initiate a specific response to address potential environmental concerns. Triggers should be more stringent than WQOs to provide sufficient time to address the potential onset of adverse environmental effects.

Recommendation #5: Golden Predator should evaluate the efficacy of existing surface and groundwater monitoring station locations and potential siting of new stations surrounding the heap leach facility.

Rationale: It is recognized that the locations of stations were determined during the licencing process. However, if in the future mining recommences or if new activities on site commence, monitoring station locations need to be evaluated to ensure the receiving environment is protected. Monitoring stations should be present upstream and downstream and up-gradient and downgradient of each mining component, i.e. heap leach facility, land application area, pits, and waste rock piles, etc. Existing stations and wells should be re-evaluated to ensure they are still appropriate and usable.

In addition, flow paths should be considered in monitoring location review. For example, the flow path from lower Laura Creek to the South Klondike River it is not clear. The creek flows through a vast wetland area before reaching BC-39 (WQO station) and might lose surface flow and/or develop various channels. A defined channel should be selected for monitoring locations.

BC-20, BC-23, BC-24, and BC-25 are shown on Figure 2 but not on Figure 16 of this report. These wells are not depicted on the groundwater equipotential map presented, nor mentioned at all in the Updated Hydrogeology Baseline Assessment (Tetra Tech 2016). The reason for this is unknown to WRB. WRB reviewed its records and found groundwater quality data from 1996-2003 for BC-20 and BC-23, 1996-2000 for BC-24, and 1996-1997 for BC-25. If these wells have not been decommissioned and are in working condition, WRB recommends that Golden Predator monitors them at the same frequency as the other wells in the leach pad area. If the wells are not functional, they should be repaired or replaced and monitored in the future.

Lastly, Golden Predator should monitor surface water quality and quantity upstream of the heap leach facility on Carolyn and Laura creeks. Surface water upstream of the heap leach pad should be monitored on Carolyn and Laura creeks to compare with downstream stations (i.e. BC-2 and BC-3). BC-32 on Laura Creek was monitored previously, however not recently. This station should be monitored as an upstream station to compare with downstream monitoring stations. However, impacts to the creek above this station should be confirmed to ensure it is in fact unimpacted because it is down gradient of wasterock pits.

Recommendation #6: Golden Predator should continue a monthly and quarterly frequency of monitoring for surface water and groundwater quality, respectively, to support comprehensive understanding of water quality conditions on site. Groundwater levels should be monitored continuously using data loggers and atmospheric pressure should be monitored at the same measurement interval such that water level measurements can be accurately barometrically compensated. Additionally, to understand the natural variability

during times of high variability (i.e. spring freshet) in surface water, it is recommended to also conduct 5 sampling events in 30 days.

Rationale: It is recognized Golden Predator is currently sampling at a greater frequency than required under water licence QZ96-007. It is important for Golden Predator to continue monthly monitoring of surface water and quarterly for groundwater stations possibly impacted by the project and stations that represent background conditions (i.e. upstream, such as BC-38). Recent data (2009-present) is primarily sampled in the open water season and therefore low flow conditions have not been represented in the dataset. Golden Predator needs data to justify that mining operations do not have an impact on the receiving environment or if it has an impact, Golden Predator has the ability to compare conditions with past data. Understanding past and current environmental conditions on site is critical for the identification of Contaminants of Potential Concern (COPCs), and subsequently the development of WQOs and EQSs in an effort to protect the receiving environment. The monitoring schedule (annually for most stations) is appropriate for closure but would not provide enough up-to-date data for licence amendment or renewal to support production in the foreseeable future.

Golden Predator should monitor groundwater level, conductivity, and temperature using dataloggers. Although groundwater quality sampling and manual measurements of groundwater level is suitable on a quarterly basis, WRB recommends continuous monitoring of groundwater level, conductivity, and temperature using dataloggers to enable interpretation of potential short-term changes to groundwater conditions (caused by, for example, the potential influence of freshet on groundwater conditions downgradient of the leach pad, which now is largely uncovered). WRB recommends that Golden Predator retrieve, validate, and report these data quarterly, along with the results of groundwater sampling and manual measurements of groundwater level.

Recommendation #7: Un-ionized ammonia should be added to the monitoring/reporting schedule for currently monitored water quality stations.

Rationale: Golden Predator should report un-ionized ammonia on a monthly basis at BC-28a, down gradient wells and watercourses. Un-ionized ammonia is the form that is toxic to aquatic life and therefore should be reported and compared to CCME WQG-PAL. Golden Predator is already required to monitor for total ammonia, therefore no additional samples need to be collected as un-ionized ammonia may be calculated using field pH and water temperature. These results should be reported with other monitoring data.

Recommendation #8: Golden Predator should prepare contour maps of the potentiometric groundwater surface and infer general groundwater flow directions for (a) the period during which heap effluent was discharged to the LAA (2002-2004), and (b) current conditions.

Rationale: (a) A potentiometric groundwater surface map would provide insight into flow directions and hydraulic gradients during the period during which heap effluent was discharged to the LAA (2002-2004), which would support interpretations of effects on downgradient groundwater and surface water. WRB assumes that the discharge of heap effluent to the LAA resulted in a local groundwater mounding effect in the vicinity of the LAA, which would cause radial (or at least divergent) flow away from the LAA. This effect could potentially convey groundwater impacted by the heap effluent to various wells in the monitoring network (e.g. BC-19). **(b)** A potentiometric groundwater surface map would provide insight into flow directions and hydraulic gradients based on current conditions, which would support interpretations of current and potential future effects on downgradient groundwater and surface water. As far as WRB is aware, the last time a potentiometric groundwater surface map was prepared that included the leach pad area was in 2016 (Tetra Tech 2016). That map (Figure 4a in Tetra Tech 2016) was based on conditions in August 2012.

Recommendation #9: Golden Predator should inspect and repair groundwater wells and staff gauges with deficiencies to enable monitoring as required under water licence QZ96-007.

Rationale: Groundwater monitoring wells and staff gauges require repair as monitoring of groundwater quality and surface water flow is required under licence QZ96-007. Details of deficiencies observed are described below:

There are two monitoring wells on site that need to be repaired: BC-22 and BC-67. Both wells do not have lids, which is important to prevent contaminants from entering the wells. BC-22 may have been affected by frost heaving processes that pushed the PVC screen and riser upward above the metal stickup protection monument. This results in the lid not covering the well opening. This well should be repaired (i.e. cut the PVC riser to below the metal monument). During the audit, WRB noted that BC-65 also required repair but WRB now understands that monitoring well BC-65 was re-drilled in fall 2019 (Golden Predator 2020b).

Golden Predator should fix or replace staff gauges at surface water monitoring stations that are no longer reliable. Many surface water stations have a staff gauge present, however many appear old and should be replaced or adjusted. This is likely due to freeze and thaw processes and lack of regular maintenance. The staff gauges should be fixed or replaced to ensure reliable water level/quantity data for monitoring. The stations noted as requiring repair during the site visit are BC-39, BC-31, BC-5, and BC-3.

Recommendation #10: Nested groundwater monitoring well samples should be reported such that shallow or deep samples are indicated in the station ID.

Rationale: Samples can be collected at either a shallow depth or a deep depth in nested groundwater wells. Currently there is no distinction between the shallow or the deep samples in the data reported by Golden Predator to the Yukon Water Board. It is strongly recommended that Golden Predator specifies which depth the sample is coming from when reporting data to the Yukon Water Board to enable interpretation of the results.

Recommendation #11: Golden Predator should locate, compile, and share well records (geologic logs and installation as-built drawings) for all groundwater monitoring wells on site.

Rationale: The Updated Hydrogeology Baseline Assessment (Tetra Tech 2016) does not include well logs or report screen lengths or dates of completion for monitoring wells. The report also does not refer at all to BC-20, BC-23, BC-24, or BC-25. WRB located geologic logs and installation as-built drawings for BC-65 and BC-66, which were installed in May 2002 (Viceroy Minerals Corporation 2002b) but was unable to locate this information for the remaining relevant wells.

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Appendix A: Site Observations

Closure activities have occurred at the Brewery Creek mine for 17 years. Most waste rock piles have been covered and revegetated, along with the heap. The site vegetation is plentiful and lush, however many invasive covers are covered with grass and clover and there is an intention to remove clover and replace it with native species such as fireweed. Although it must be noted that fireweed is widely present on all the covers and some trees are growing as well (willow, alder and aspen).

Mine Activities

At the time of the site visit, the site was fairly busy (25 people in camp). Golden Predator was conducting drilling at the time and was reestablishing old roads, clearing new roads (under the Class 4 exploration permit), and clearing undeveloped heap leach cells (cells #8-10).

Site Access

Most surface water monitoring sites can be accessed by truck. Far away sites along the South Klondike River and reference sites are accessed by helicopter only. Groundwater monitoring wells are best accessed by ATV. BC-68-2 and BC-69 could not be accessed with the side-by-side due to overgrown vegetation.

Heap pad

Golden Predator was clearing the undeveloped cells 8-10 of the heap leach facility in anticipation of future mine plans. Station BC-28a is a valve at the toe of the heap (see Appendix D – Photo 15). The valve was closed. At the time of the site visit it was unclear whether water was flowing from this location. It is understood that the berm dyke was breached in 2009 at the toe of the heap allowing for heap water to flow freely to the pregnant pond.

Test Cover Lysimeter (BC-70)

At the time of the site visit, the geotextile was exposed in several areas and we could see erosional pathways forming in the soil, indicating that the liner is at risk. The covers needs to be monitored and maintained, or perhaps the preferential pathways could be lined so that the erosion does not damage the cover underneath.

Appendix B: Field Notes

Station Code	Station Description	Latitude	Longitude	Field Notes
Surface Water				
BC-6	South Klondike River d/s Lee Creek	63.98749	-138.35587	No water samples collected.
BC-39	Laura Creek u/s South Klondike River	63.987	-138.3136	No water sample collected. Branch of Laura creek flowing into South Klondike. Beware; creek is losing flow into a wetland upstream of BC-39. Monitored as part of the Laura Creek impact study. Jillian collected water, sediment and flow.
BC-1	Laura Creek upstream ditch road	63.99781	-138.251	Staff gauge and level logger at this location. Jillian measured flow. Water temperature is very cold, through permafrost?
BC-37	Laura Creek at ditch road (d/s of BC-1)	63.99887	-138.26122	No water sample collected. Uncertain why BC-37 and BC-1 are so close to one another. Unclear if there is effluent into Laura Creek between BC-1 and BC-37. Jillian measured flow. Jillian says there is no effluent coming into Laura Creek.
BC-31	Golden Creek u/s of South Klondike river	64.0308	-138.085967	No water sample collected. Heli pad very close. Jillian took flow and water samples. Staff gauge leaning and needs to be fixed.
BC-5	Pacific creek u/s of Lee creek	64.03116	-138.39015	No water sample collected. Heli landing site. Jillian collected water samples and flow. Staff gauge bent; need to be replaced.
BC-32	Laura Creek below Exploration Camp	64.04631	-138.254	Downgradient of the land application slope. Station sampled in the past. There is an old access road going down to the creek and obvious marks of a monitoring location. This location is mentioned in the conceptual AMP (2013 – for YESAB)
BC-70	Blue Waste Rock Storage Area lysimeter	64.04745	-138.261	No water sample collected. From past documents, it seems that the lysimeter collected effluent and onto the shallow soil, above the geotextile. At the time of the visit, the pipe upgradient going into the lysimeter was disconnected. The tote was half full, possibly from rain water or snow melt. The cover has a gully going down the slope and may expose liner.

BC-28a	Discharge from heap	64.03892	-138.29	Sampled water from the valve on the pipe. Pipes drain water from the heap (previously the pregnant solution). Valve was closed but trickled into a drain to the old 'pregnant pond'. However we could hear water flowing underneath the surface.
BC-2	Carolyn Creek u/s Laura Creek	64.02528	-138.296	Hike from ATV trail and cross stream. Site is 50m upstream.
BC-3	Laura Creek above Carolyn Creek	64.02461	-138.291	Drive down and hike 150m. Need to replace old staff gauge. Jillian collected water samples and flow. Field Blank processed here.
LAURA-0.15	Laura Creek 0.15km d/s confluence of Carolyn and Laura Creek	64.0221	-138.293	Difficult hike.
LAURA-US	Laura Creek u/s Lower Foster Pit	64.05175	-138.224	Drive down Lower Foster Road, hike to creek. Small creek (30cm wide), substrate reddish.
LUCKY-DS	Lucky Creek	64.06488	-138.16301	Park at bottom of road at Bohemian Pit. Hike 100m d/s of confluence. Substrate red/orange. May be a branch of creek because upstream more water.
LUCKY-RD	Lucky Creek	64.06334	-138.165	Sample u/s of culvert, off road to Bohemia Pit. Substrate red-brown.
LUCKY-TRIB	Lucky Creek	64.06464	-138.168	Creek along Lucky Pit, beside road. Very small (15cm wide) creek.
LUCKY-US	Lucky Creek	64.06544	-138.183	Very small creek ~10cm deep. Creek upgradient of road.
KOKANEE-PIT	Kokanee Pit	64.05718	-138.204	Opportunistic sampling. Drive to pit. Drillers pumping water at time of sampling ~100m away. Water turbid, pit walls red.
GOLDEN-SEEP	Seep at toe of Golden waste rock pile	64.05981	-138.193	Opportunistic sampling. Sampled from a small pond located at the toe of the Golden waste rock pile. This pond is also located in upper lucky creek. Lucky Creek is very small (hard to see, downstream of "Lucky US"). It is thus unclear if water comes from Lucky Creek or from water flowing on or through the Golden waste rock pile, or perhaps from both.
GOLDEN-PIT	Golden Pit	64.05917	-138.186	Opportunistic sampling. This pit seems to be on the flow path of upper Lucky Creek.

				Water was flowing into the pit but not discharging from the pit on surface. Water infiltrates to the ground underneath the pit in the Lucky Creek watershed. Large amount of invertebrate (water boatmen) and aquatic plants in the pit.
Groundwater				
Groundwater monitoring wells were sampled using a Waterra Hydrolift inertial pump available at the site. Alternative sampling methods were not available and resulted in some of the monitoring wells not being able to be sampled. A submersible groundwater sampling pump should be available to sample the wells where the Waterra Hydrolift pump is not usable.				
BC-19	Monitoring well located downgradient and southwest of the ponds	64.03521	-138.291	Monitoring well in good condition; 2-inch diameter PVC riser pipe protected by a 6-inch diameter metal stick-up monument. Well not locked.
BC-66	Monitoring well located downgradient and south of the ponds	64.03342	-138.284	Nested monitoring well (deep (BC-66-2) and shallow (BC-66-1)) in good condition; two 2-inch diameter PVC riser pipes enclosed by a 6-inch diameter metal stick-up monument. The shallow monitoring well (BC-66-1) was dry at the time of the site visit. Well not locked.
BC-65	Monitoring well located upgradient and east of the ponds			The 2-inch diameter PVC riser was observed to be elevated above the 6-inch diameter metal stick-up monument – possibly the result of frost heaving. A tree is growing around the monitoring well and the well was dry. No lid and no padlock were observed on the well.
BC-21	Monitoring well located cross-gradient and north of the heap leach pad.	64.04687	-138.281	Monitoring well in good condition; 2-inch diameter PVC riser pipe protected by a 6-inch diameter metal stick-up monument. Well not locked. One groundwater data logger was present inside the well.

Appendix C: Field Data

Station Name	T° C	DO (mg/L)	SPC (µS/cm)	pH	ORP (mV)	Turbidity (NTU)	Date (yymmdd)	Time (24 h)
BC-6	6.3	11.45	307	7.45	-	0.32	190827	11:33
BC-39	4.0	12.72	585	7.85	-	1.85	190827	12:21
BC-1	1.5	13.43	598	7.83	-	3.1	190827	13:20
BC-37	2.1	13.71	596	7.90	-	2.1	190827	14:31
BC-31	3.5	12.91	694	7.92	-	0.43	190827	15:18
BC-5	5.1	12.18	601	7.82	-	0.30	190827	16:01
BC-32	2.1	11.89	354	7.38	-	0.6	190827	18:09
BC-19	1.4	5.47	1442	6.47	177.8	18.86	190827	10:07
BC-66-2	3.4	0.94	776	7.05	164.2	50.59	190827	12:33
BC-21	3.6	2.27	461.2	6.71	106.6	10.47	190827	14:18
BC-28a	4.7	11.76	4297	7.1	-	1.3	190828	7:43
BC-3	0.7	13.08	624	7.81	-	1.89	190828	9:17
BC-2	1	11.92	1080	7.47	-	1.51	190828	10:01
LAURA-0.15	0.9	13.08	651	7.69	-	2	190828	10:31
LAURA-US	0.7	11.23	428.4	7.37	-	1.2	190828	11:33
LAURA-US (QR)	-	-	-	-	-	-	190828	11:33
LUCKY-DS	2	12.52	813	7.42	-	0.91	190828	14:25
LUCKY-RD	2.1	12.39	713	7.56	-	0.8	190828	14:45
LUCKY-TRIB	4.9	11.68	442.2	7.92	-	2.78	190828	15:05
LUCKY-US	1.8	12.74	330.9	7.62	-	0.31	190828	15:33
GOLDEN-SEEP	4.5	9.97	339	7.6	-	0.22	190828	15:53
GOLDEN-PIT	10.4	10.22	640	7.82	-	0.3	190828	16:28
KOKANEE-PIT	11.6	9.5	378	7.97	-	9.5	190828	16:46

Station Code	Notes	Depth to GW (mbtoc)	Total depth to MW bottom (mbtoc)
BC-19	Monitoring well located downgradient and southwest of the ponds	41.067	58.35
BC-66-2	Nested monitoring well located downgradient and south of the ponds	51.000	67.00
BC-66-1		dry	17.16
BC-65	Monitoring well located upgradient and east of the ponds	dry	66.60
BC-21	Monitoring well located cross-gradient and north of the heap leach pad.	34.358	81.00
BC-22	Monitoring well not sampled	44.870	>100*
BC-67	Monitoring well not sampled	37.357	51.540

GW: groundwater; MW: monitoring well; mbtoc: meters below top of casing; * maximum length of level tape reached

Appendix D: Photo Log

August 27, 2019

Photo 1. Station BC-6.

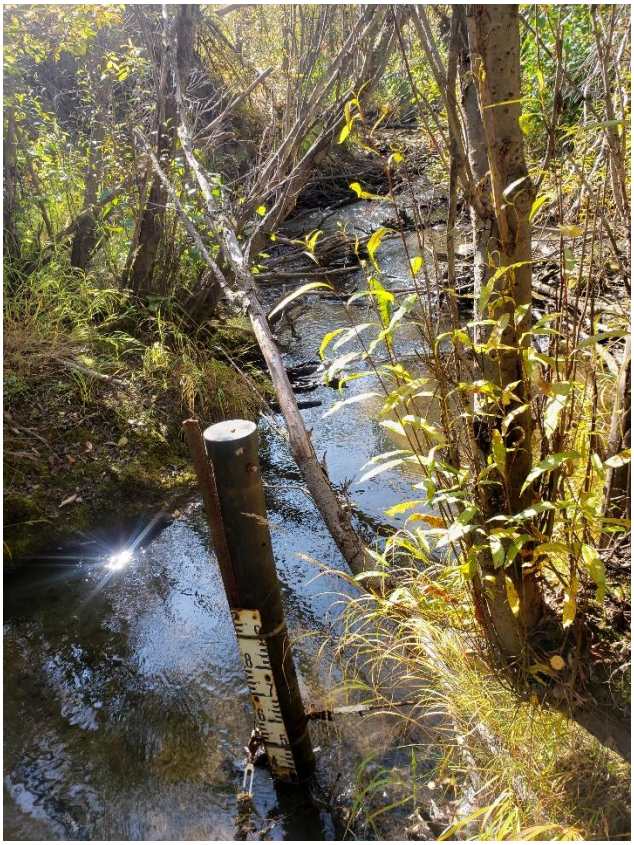

Photo 2. Station BC-39.

Photo 3. Station BC-1.

Photo 4. Station BC-37.

Photo 5. Station BC-31.

Photo 6. Station BC-5.

Photo 7. Station BC-32.

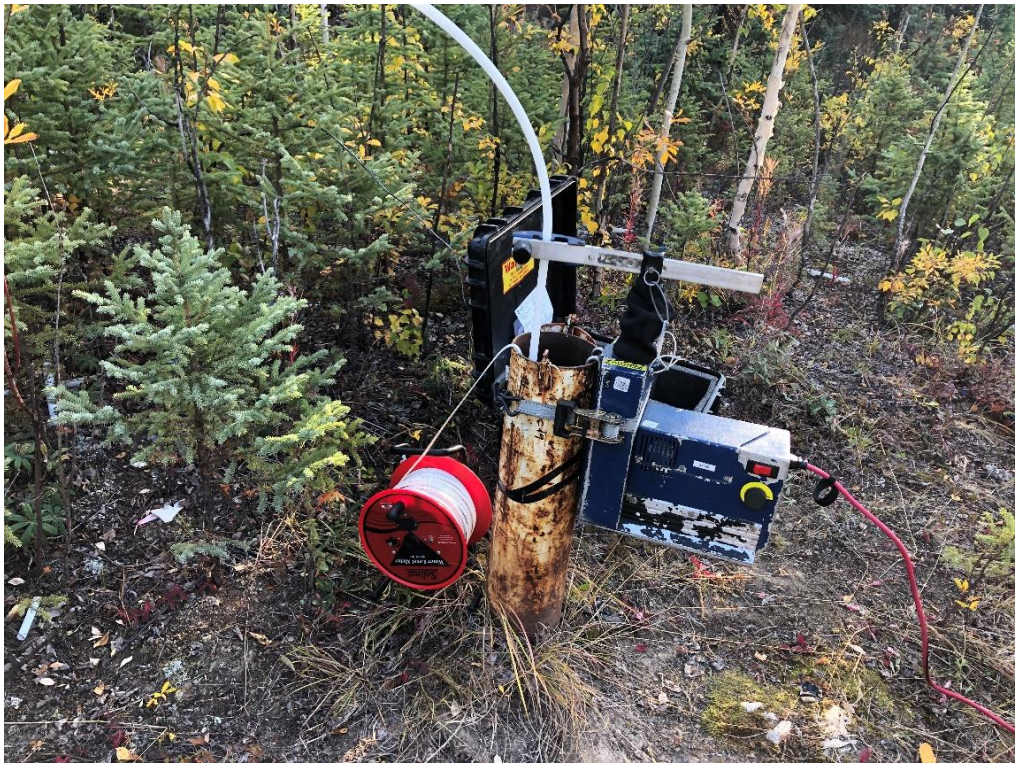

Photo 8. Station BC-19.

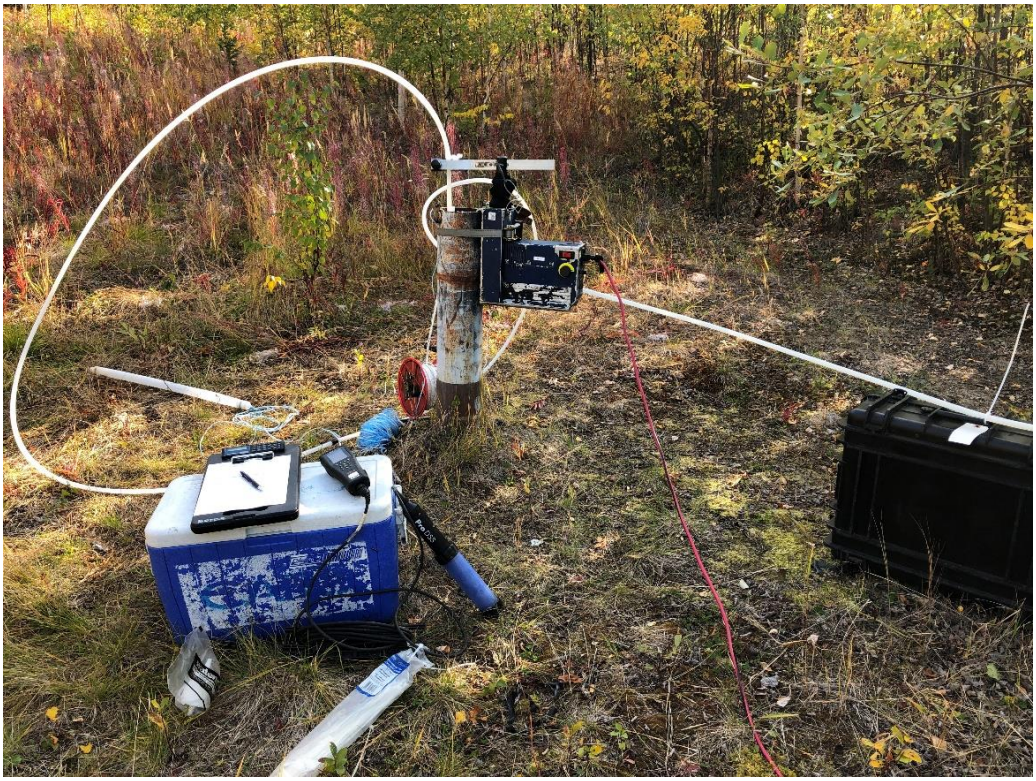

Photo 9. Station BC-66.

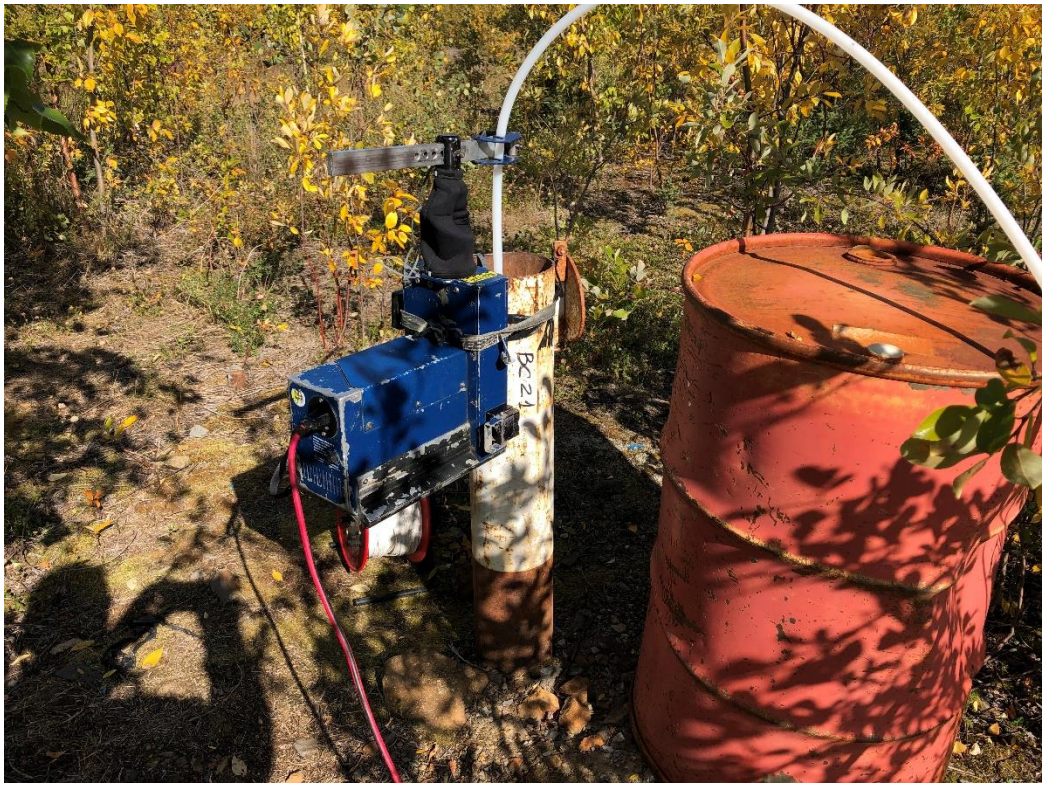

Photo 10. Station BC-21.

Photo 11. Station BC-22.

Photo 12. Station BC-65.

Photo 13. Station BC-70. Test cover lysimeter.

Photo 14. Station BC-70. Test cover lysimeter piping disconnected.

Photo 15. Station BC-28a. Valve at the toe of heap. Old piping connection on right.

Photo 16. Station BC-3.

Photo 17. Station BC-2.

Photo 18. Station LAURA-0.15.

Photo 19. Station LAURA-US.

Photo 20. Station LUCKY-DS.

Photo 21. Station LUCKY-RD.

Photo 22. Station LUCKY-TRIB.

Photo 23. Station LUCKY-US.

Photo 24. Station GOLDEN-SEEP.

Photo 25. Station GOLDEN-PIT.

Photo 26. Station KOKANEE-PIT.

Appendix E: Quality Assurance and Control

Quality control of available field data compared to laboratory data.

Station	Date	Cond-F	Cond-L	RPD (%)	pH-F	pH-L	RPD (%)
BC-28a	2019-08-28 07:43	4297	4360	1.46	7.1	7.7	8.11
BC-19	2019-08-27 10:00	1442	1450	0.55	6.47	6.98	7.58
BC-66-2	2019-08-27 12:30	776	791	1.91	7.05	7.78	9.84
BC-1	2019-08-27 13:20	598	599	0.17	7.83	8.1	3.39
BC-21	2019-08-27 14:45	461.2	469	1.67	6.71	7.35	9.10
BC-32	2019-08-27 18:09	354	636	56.97	7.38	7.96	7.56
BC-3	2019-08-28 9:17	624	642	2.84	7.81	8.01	2.53
BC-2	2019-08-28 10:01	1080	1120	3.64	7.47	7.93	5.97
LAURA-0.15	2019-08-28 10:31	651	868	28.57	7.69	7.97	3.58
LUCKY-DS	2019-08-28 14:25	813	829	1.95	7.42	7.98	7.27
LUCKY-RD	2019-08-28 14:45	713	729	2.22	7.56	7.95	5.03
LUCKY-TRIB	2019-08-28 15:05	442.2	451	1.97	7.92	8.1	2.25
LUCKY-US	2019-08-28 15:33	330.9	338	2.12	7.62	8.04	5.36
GOLDEN-SEEP	2019-08-28 15:53	339	357	5.17	7.6	7.89	3.74
GOLDEN-PIT	2019-08-28 16:28	640	668	4.28	7.82	8.14	4.01
KOKANEE-PIT	2019-08-28 16:46	378	406	7.14	7.97	8.11	1.74
LAURA-US	2019-08-28 11:33	428.4	426	0.56	7.37	7.83	6.05

Comparison between field replicates

Parameter	LAURA-US 8/28/2019 Sample	LAURA-US 8/28/2019 Replicate	RPD (%)
Ag-D	<0.000050	<0.000050	0.00
Ag-T	<0.000050	<0.000050	0.00
Al-D	<0.0050	<0.0050	0.00
Alk-B	132	132	0.00
Alk-C	<1.0	<1.0	0.00
Alk-OH	<1.0	<1.0	0.00
Alk-P	<1.0	<1.0	0.00
Alk-T	132	132	0.00
Al-T	0.0135	0.0139	2.92
As-D	0.00134	0.00128	4.58
As-T	0.00156	0.00157	0.64
Ba-D	0.0653	0.066	1.07
Ba-T	0.0662	0.0664	0.30
B-D	0.014	0.0147	4.88
Be-D	<0.00010	<0.00010	0.00

Be-T	<0.00010	<0.00010	0.00
Bi-D	<0.00010	<0.00010	0.00
Bi-T	<0.00010	<0.00010	0.00
B-T	0.0173	0.0172	0.58
Ca-D	52.5	53.4	1.70
Ca-T	55.1	54.6	0.91
Cd-D	0.000183	0.000179	2.21
Cd-T	0.000214	0.00022	2.76
Chlord	0.24	0.25	4.08
CN-T	<0.0020	<0.0020	0.00
CN-WAD	<0.0020	<0.0020	0.00
Co-D	0.00022	0.00023	4.44
Cond-L	426	423	0.71
Co-T	0.00023	0.00025	8.33
Cr-D	0.00062	0.00072	14.93
Cr-T	0.00053	0.00054	1.87
Cu-D	0.00051	0.00051	0.00
Cu-T	0.00066	0.00057	14.63
Fe-D	0.274	0.277	1.09
Fe-T	0.313	0.334	6.49
Fluord	0.21	0.21	0.00
Hard-D	213	217	1.86
Hg-D	<0.000010	<0.000010	0.00
Hg-T	<0.000010	<0.000010	0.00
K-D	1.32	1.35	2.25
K-T	1.44	1.45	0.69
Li-D	0.0112	0.0114	1.77
Li-T	0.0115	0.0115	0.00
Mg-D	19.9	20.2	1.50
Mg-T	22.5	22.5	0.00
Mn-D	0.0496	0.0505	1.80
Mn-T	0.0563	0.0574	1.93
Mo-D	0.00194	0.00105	59.53
Mo-T	0.00302	0.00105	96.81
Na-D	1.08	1.11	2.74
Na-T	1.58	1.6	1.26
Ni-D	0.00359	0.00366	1.93
Ni-T	0.0044	0.00448	1.80
N-NH3u	0.002	0.001	66.67
N-NH4	0.055	0.041	29.17
N-NO2	<0.0050	<0.0050	0.00
N-NO23	0.146	0.139	4.91
N-NO3	0.146	0.139	4.91
Pb-D	<0.00020	<0.00020	0.00
Pb-T	<0.00020	<0.00020	0.00
P-D	<0.050	<0.050	0.00
pH-L	7.83	7.83	0.00

P-T	<0.050	<0.050	0.00
Sb-D	0.0108	0.0109	0.92
Sb-T	0.0108	0.0108	0.00
S-D	36	36.6	1.65
Se-D	0.00369	0.00379	2.67
Se-T	0.00405	0.00377	7.16
Si-D	4	4.2	4.88
Si-T	4.4	4.3	2.30
Sn-D	<0.00020	<0.00020	0.00
Sn-T	<0.00020	<0.00020	0.00
SO4-D	98.7	98.9	0.20
Sr-D	0.336	0.343	2.06
Sr-T	0.342	0.34	0.59
S-T	37.6	37.6	0.00
TDS	255	257	0.78
Te-D	<0.00050	<0.00050	0.00
Te-T	<0.00050	<0.00050	0.00
Th-D	<0.00010	<0.00010	0.00
Th-T	<0.00010	<0.00010	0.00
Ti-D	<0.0050	<0.0050	0.00
Ti-T	<0.0050	<0.0050	0.00
Tl-D	<0.000020	<0.000020	0.00
Tl-T	<0.000020	<0.000020	0.00
TSS	2.2	2.4	8.70
U-D	0.00125	0.00129	3.15
U-T	0.0013	0.00128	1.55
V-D	<0.0010	<0.0010	0.00
V-T	<0.0010	<0.0010	0.00
W-D	<0.0010	<0.0010	0.00
W-T	<0.0010	<0.0010	0.00
Zn-D	0.0153	0.0153	0.00
Zn-T	0.0159	0.0159	0.00
Zr-D	<0.00010	<0.00010	0.00
Zr-T	<0.00010	<0.00010	0.00

Comparison of samples independently collected by WRB and licensee, but during a similar time. These values are for interest purposes only, as different labs were used and therefore have potentially different analytical methods and detection limits. It should be noted that half the MDL was used to calculate the relative percent difference (RPD) for censored data (below detection limit). Values with high RPD's are apparent for results with a very small value (less than 10^{-1}).

Parameter	Unit	Sampler	BC-01~	BC-02^	BC-03†
Alk-B	mgCaCO3/L	WRB	155	221	163
		GP	192	263	198
		RPD	21.33	17.36	19.39
Alk-C	mgCaCO3/L	WRB	<1.0	<1.0	<1.0
		GP	<0.5	<0.5	<0.5

		RPD	0	0	0
Alk-OH	mgCaCO3/L	WRB	<1.0	<1.0	<1.0
		GP	<0.5	<0.5	<0.5
		RPD	0	0	0
Alk-P	mgCaCO3/L	WRB	<1.0	<1.0	<1.0
		GP	<0.5	<0.5	<0.5
		RPD	0	0	0
Alk-T	mgCaCO3/L	WRB	155	221	163
		GP	158	215	162
		RPD	1.92	2.75	0.62
Chlord	mg/L	WRB	0.41	1.76	0.36
		GP	<0.5	2.2	<0.5
		RPD	48.48	22.22	36.07
Al-D	mg/L	WRB	0.0074	<0.0050	0.0234
		GP	0.0104	0.0038	0.0303
		RPD	33.71	41.27	25.70
As-D	mg/L	WRB	0.00436	<0.00050	0.00143
		GP	0.0041	0.0003	0.00148
		RPD	6.15	18.18	3.44
Sb-D	mg/L	WRB	0.00275	0.00064	0.00402
		GP	0.0026	0.0006	0.00365
		RPD	5.61	6.45	9.65
Ba-D	mg/L	WRB	0.0585	0.0498	0.0546
		GP	0.0593	0.0497	0.05420
		RPD	1.36	0.20	0.74
B-D	mg/L	WRB	0.0473	0.0166	0.0146
		GP	<0.01	<0.01	<0.01
		RPD	161.76	107.41	97.96
Be-D	mg/L	WRB	<0.00010	<0.00010	<0.00010
		GP	<0.00001	<0.00001	0.00002
		RPD	0	0	85.71
Bi-D	mg/L	WRB	<0.00010	<0.00010	<0.00010
		GP	<0.000005	<0.000005	<0.000005
		RPD	0	0	0
Ca-D	mg/L	WRB	72.3	139	78.2
		GP	78.6	148	82.2
		RPD	8.35	6.27	4.99
Cd-D	mg/L	WRB	0.000024	0.000016	0.000043
		GP	0.0000151	0.0000167	0.000037
		RPD	45.52	4.28	15.00
Co-D	mg/L	WRB	0.00061	0.00527	0.00114
		GP	0.0006	0.0060	0.00097

		RPD	1.65	12.95	16.11
Cr-D	mg/L	WRB	0.00057	0.00073	0.00065
		GP	<0.0001	<0.0001	<0.0001
		RPD	167.74	174.36	171.43
Cu-D	mg/L	WRB	0.00076	0.00063	0.00093
		GP	0.0006	0.0003	0.00064
		RPD	23.53	70.97	36.94
Fe-D	mg/L	WRB	0.027	0.031	0.085
		GP	0.0526	0.0279	0.14700
		RPD	64.32	10.53	53.45
Li-D	mg/L	WRB	0.0152	0.0239	0.0179
		GP	0.0137	0.0213	0.01590
		RPD	10.38	11.50	11.83
Pb-D	mg/L	WRB	<0.00020	<0.00020	<0.00020
		GP	<0.000005	<0.000005	0.0000067
		RPD	0	0	0
Hg-D	mg/L	WRB	<0.000010	<0.000010	<0.000010
		GP	<0.000002	<0.000002	<0.000002
		RPD	0	0	0
Mg-D	mg/L	WRB	30.5	59.1	32.6
		GP	30.1	57.2	31.3
		RPD	1.32	3.27	4.07
Mn-D	mg/L	WRB	0.0541	0.0357	0.102
		GP	0.0531	0.0335	0.104
		RPD	1.87	6.36	1.94
Mo-D	mg/L	WRB	0.00348	0.00037	0.0028
		GP	0.00335	0.000349	0.00265
		RPD	3.81	5.84	5.50
Ni-D	mg/L	WRB	0.00225	0.00058	0.00524
		GP	0.00237	0.000815	0.00489
		RPD	5.19	33.69	6.91
K-D	mg/L	WRB	1.38	2.1	1.52
		GP	1.55	2.28	1.76
		RPD	11.60	8.22	14.63
P-D	mg/L	WRB	<0.050	<0.050	<0.050
		GP	0.0091	0.0049	0.00690
		RPD	93.26	134.45	113.48
Ag-D	mg/L	WRB	<0.000050	<0.000050	<0.000050
		GP	<0.000005	<0.000005	<0.000005
		RPD	0	0	0
Na-D	mg/L	WRB	4.4	10.2	3.73
		GP	4.7	10.4	3.92

		RPD	6.59	1.94	4.97
S-D	mg/L	WRB	62.6	142	66.8
		GP	57.2	131	59.9
		RPD	9.02	8.06	10.89
Se-D	mg/L	WRB	0.00177	0.00616	0.00145
		GP	0.0016	0.0057	0.00130
		RPD	10.09	7.76	10.91
Si-D	mg/L	WRB	5.7	6	4.8
		GP	5.1800	5.3900	4.27000
		RPD	9.56	10.71	11.69
Sr-D	mg/L	WRB	0.378	0.386	0.423
		GP	0.3960	0.4130	0.43800
		RPD	4.65	6.76	3.48
Sn-D	mg/L	WRB	<0.00020	<0.00020	<0.00020
		GP	<0.0002	<0.0002	<0.0002
		RPD	0	0	0
Ti-D	mg/L	WRB	<0.0050	<0.0050	<0.0050
		GP	<0.0005	<0.0005	<0.0005
		RPD	0	0	0
Tl-D	mg/L	WRB	<0.000020	<0.000020	<0.000020
		GP	<0.000002	<0.000002	<0.000002
		RPD	0	0	0
U-D	mg/L	WRB	0.00308	0.00314	0.00275
		GP	0.0030	0.0030	0.00258
		RPD	2.63	4.56	6.38
V-D	mg/L	WRB	<0.0010	<0.0010	<0.0010
		GP	<0.0002	<0.0002	<0.0002
		RPD	0	0	0
Zn-D	mg/L	WRB	<0.0040	<0.0040	0.0106
		GP	0.0009	0.0005	0.00626
		RPD	73.04	121.29	51.48
Zr-D	mg/L	WRB	<0.00010	<0.00010	<0.00010
		GP	<0.0001	<0.0001	<0.0001
		RPD	0	0	0
Hard-D	mgCaCO3/L	WRB	306	591	330
		GP	320	604	334
		RPD	4.47	2.18	1.20
N-NH4	mg/L	WRB	0.04	0.057	0.068
		GP	0.012	-	0.019
		RPD	107.69	NA	112.64
N-NO2	mg/L	WRB	<0.0050	<0.0050	<0.0050
		GP	<0.0020	0.0022	<0.0020

		RPD	0	0	0
N-NO23	mg/L	WRB	0.258	3.59	0.108
		GP	0.272	3.76	0.115
		RPD	5.28	4.63	6.28
N-NO3	mg/L	WRB	0.258	3.59	0.108
		GP	0.272	3.76	0.115
		RPD	5.28	4.63	6.28
TSS	mg/L	WRB	7.4	7.4	2.6
		GP	19	12	4.4
		RPD	87.88	47.42	51.43
Al-T	mg/L	WRB	0.0434	0.0349	0.0487
		GP	0.0667000	0.06410	0.05610
		RPD	42.33	58.99	14.12
As-T	mg/L	WRB	0.00563	<0.00050	0.00255
		GP	0.0050700	0.00042	0.00231
		RPD	10.47	50.52	9.88
Sb-T	mg/L	WRB	0.0028	0.00066	0.00414
		GP	0.0026500	0.00064	0.00365
		RPD	5.50	2.92	12.58
Be-T	mg/L	WRB	<0.00010	<0.00010	<0.00010
		GP	0.0000110	<0.000010	0.00003
		RPD	127.87	0	66.67
Bi-T	mg/L	WRB	<0.00010	<0.00010	<0.00010
		GP	<0.0000050	<0.000010	<0.000010
		RPD	0	0	0
B-T	mg/L	WRB	0.0276	0.0204	0.0174
		GP	<0.010	0.01400	0.01100
		RPD	138.65	37.21	45.07
Ca-T	mg/L	WRB	76.3	146	80.9
		GP	78.5	151	82.3
		RPD	2.84	3.37	1.72
Cd-T	mg/L	WRB	0.000035	0.000023	0.000056
		GP	0.0000229	0.00002	0.00005
		RPD	41.80	15.96	12.52
Co-T	mg/L	WRB	0.00073	0.00816	0.00134
		GP	0.0006290	0.00681	0.00109
		RPD	14.86	18.04	20.58
Cr-T	mg/L	WRB	0.0006	0.00068	0.00073
		GP	0.0002000	0.00014	0.00011
		RPD	100.00	131.71	147.62
Cu-T	mg/L	WRB	0.00166	0.00123	0.00102
		GP	0.0007060	0.00057	0.00077

		RPD	80.64	73.33	27.93
Ba-T	mg/L	WRB	0.0622	0.0518	0.0557
		GP	0.0616000	0.05440	0.05470
		RPD	0.97	4.90	1.81
Fe-T	mg/L	WRB	0.315	0.104	0.374
		GP	0.3330000	0.17700	0.39300
		RPD	5.56	51.96	4.95
Li-T	mg/L	WRB	0.0159	0.0248	0.0183
		GP	0.0134000	0.02260	0.01640
		RPD	17.06	9.28	10.95
Pb-T	mg/L	WRB	<0.00020	<0.00020	<0.00020
		GP	0.0000572	0.00014	0.00005
		RPD	54.45	31.22	72.11
Hg-T	mg/L	WRB	<0.000010	<0.000010	<0.000010
		GP	<0.0000020	<0.0000020	<0.0000020
		RPD	0	0	0
Mg-T	mg/L	WRB	33.5	67.6	35.4
		GP	29.4	60.5	31.9
		RPD	13.04	11.09	10.40
Mn-T	mg/L	WRB	0.0634	0.0415	0.115
		GP	0.0562000	0.03740	0.11200
		RPD	12.04	10.39	2.64
Mo-T	mg/L	WRB	0.00366	0.00036	0.0028
		GP	0.0034100	0.00038	0.00270
		RPD	7.07	4.35	3.64
Ni-T	mg/L	WRB	0.00308	0.00124	0.00645
		GP	0.0025600	0.00105	0.00516
		RPD	18.44	16.59	22.22
K-T	mg/L	WRB	1.5	2.3	1.64
		GP	1.43	2.27	1.66
		RPD	4.78	1.31	1.21
P-T	mg/L	WRB	<0.050	<0.050	<0.050
		GP	0.0117000	0.01600	0.01190
		RPD	72.48	43.90	71.00
Ag-T	mg/L	WRB	<0.000050	<0.000050	<0.000050
		GP	<0.0000050	<0.000010	<0.000010
		RPD	0	0	0
Na-T	mg/L	WRB	5.14	12.1	4.41
		GP	4.51	10.9	3.95
		RPD	13.06	10.43	11.00
Se-T	mg/L	WRB	0.00188	0.00663	0.00152
		GP	0.0016600	0.00622	0.00132

		RPD	12.43	6.38	14.08
Si-T	mg/L	WRB	6.3	6.7	5.2
		GP	5.1800000	5.78000	4.48000
		RPD	19.51	14.74	14.88
Sr-T	mg/L	WRB	0.396	0.401	0.43
		GP	0.3830000	0.40900	0.41400
		RPD	3.34	1.98	3.79
S-T	mg/L	WRB	64.2	154	68.1
		GP	58.3	143	61.8
		RPD	9.63	7.41	9.70
Sn-T	mg/L	WRB	<0.00020	<0.00020	<0.00020
		GP	<0.00020	<0.00020	<0.00020
		RPD	0	0	0
Ti-T	mg/L	WRB	<0.0050	<0.0050	<0.0050
		GP	0.0022200	0.00290	<0.002
		RPD	11.86	14.81	0
Tl-T	mg/L	WRB	<0.000020	<0.000020	<0.000020
		GP	0.0000029	<0.0000020	0.0000025
		RPD	110.08	0	120
U-T	mg/L	WRB	0.00314	0.00319	0.00276
		GP	0.0030500	0.00319	0.00269
		RPD	2.91	0	2.57
V-T	mg/L	WRB	0.0015	<0.0010	<0.0010
		GP	0.0006200	0.00049	0.00045
		RPD	83.02	2.02	10.53
Zn-T	mg/L	WRB	0.0048	0.0042	0.0124
		GP	0.0020200	0.00100	0.00800
		RPD	81.52	123.08	43.14
Zr-T	mg/L	WRB	0.00011	<0.00010	<0.00010
		GP	0.0001100	<0.00010	<0.00010
		RPD	0	0	0
Cond-L	uS/cm	WRB	599	1120	642
		GP	620	1120	651
		RPD	3.45	0.00	1.39

*RPD % (Relative percent difference (x,y)) = [|x - y| ÷ |(x + y)/2|] * 100*

~ WRB sample collected Aug. 27, 2019 13:20, licensee sample collected Aug. 27, 2019 12:45

^ WRB sample collected Aug. 28, 2019 10:01, licensee sample collected Aug. 28, 2019 11:00

† WRB sample collected Aug. 28, 2019 9:17, licensee sample collected Aug. 28, 2019 12:00

Appendix F: CARO Analytical Report

CERTIFICATE OF ANALYSIS

REPORTED TO	Yukon Government - Water Resources Suite 210, 419 Range Road Whitehorse, YT Y1A 3V1		
ATTENTION	Nicole Novodvorsky	**WORK ORDER**	9082964
PO NUMBER		**RECEIVED / TEMP**	2019-08-29 14:09 / 8°C
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38
PROJECT INFO	YK Water Resources - C00043458	**COC NUMBER**	B80855

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO 17025:2005 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks

You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry

It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve

Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

If you have any questions or concerns, please contact me at bshaw@caro.ca

Authorized By:

Bryan Shaw, Ph.D., P.Chem.
Client Service Coordinator

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO Yukon Government - Water Resources
PROJECT Brewery Creek

WORK ORDER 9082964
REPORTED 2019-09-23 18:38

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-1 (BC-01) (9082964-01) | Matrix: Water | Sampled: 2019-08-27 13:20					
Anions					
Chloride	**0.41**	0.10	mg/L	2019-08-31	
Fluoride	**0.24**	0.10	mg/L	2019-08-31	
Nitrate+Nitrite (as N)	**0.258**	0.0050	mg/L	2019-09-03	
Nitrite (as N)	< 0.0050	0.0050	mg/L	2019-08-30	
Sulfate	**175**	1.0	mg/L	2019-09-02	
Calculated Parameters					
Hardness, Total (as CaCO3)	**306**	0.500	mg/L	N/A	
Ammonia, Un-Ionized (as N)	**0.002**	0.001	mg/L	2019-09-06	
Nitrate (as N)	**0.258**	0.0100	mg/L	N/A	
Solids, Total Dissolved	**380**	10	mg/L	2019-09-06	
Dissolved Metals					
Aluminum, dissolved	**0.0074**	0.0050	mg/L	2019-08-31	
Antimony, dissolved	**0.00275**	0.00020	mg/L	2019-08-31	
Arsenic, dissolved	**0.00436**	0.00050	mg/L	2019-08-31	
Barium, dissolved	**0.0585**	0.0050	mg/L	2019-08-31	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, dissolved	**0.0473**	0.0050	mg/L	2019-08-31	
Cadmium, dissolved	**0.000024**	0.000010	mg/L	2019-08-31	
Calcium, dissolved	**72.3**	0.20	mg/L	2019-08-31	
Chromium, dissolved	**0.00057**	0.00050	mg/L	2019-08-31	
Cobalt, dissolved	**0.00061**	0.00010	mg/L	2019-08-31	
Copper, dissolved	**0.00076**	0.00040	mg/L	2019-08-31	
Iron, dissolved	**0.027**	0.010	mg/L	2019-08-31	
Lead, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, dissolved	**0.0152**	0.00010	mg/L	2019-08-31	
Magnesium, dissolved	**30.5**	0.010	mg/L	2019-08-31	
Manganese, dissolved	**0.0541**	0.00020	mg/L	2019-08-31	
Mercury, dissolved	< 0.000010	0.000010	mg/L	2019-09-04	
Molybdenum, dissolved	**0.00348**	0.00010	mg/L	2019-08-31	
Nickel, dissolved	**0.00225**	0.00040	mg/L	2019-08-31	
Phosphorus, dissolved	< 0.050	0.050	mg/L	2019-08-31	
Potassium, dissolved	**1.38**	0.10	mg/L	2019-08-31	
Selenium, dissolved	**0.00177**	0.00050	mg/L	2019-08-31	
Silicon, dissolved	**5.7**	1.0	mg/L	2019-08-31	
Silver, dissolved	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, dissolved	**4.40**	0.10	mg/L	2019-08-31	
Strontium, dissolved	**0.378**	0.0010	mg/L	2019-08-31	
Sulfur, dissolved	**62.6**	3.0	mg/L	2019-08-31	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, dissolved	< 0.000020	0.000020	mg/L	2019-08-31	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-1 (BC-01) (9082964-01) | Matrix: Water | Sampled: 2019-08-27 13:20, Continued					
Dissolved Metals, Continued					
Thorium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, dissolved	**0.00308**	0.000020	mg/L	2019-08-31	
Vanadium, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, dissolved	< 0.0040	0.0040	mg/L	2019-08-31	
Zirconium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
General Parameters					
Alkalinity, Total (as CaCO3)	**155**	1.0	mg/L	2019-09-03	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Bicarbonate (as CaCO3)	**155**	1.0	mg/L	2019-09-03	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Ammonia, Total (as N)	**0.040**	0.020	mg/L	2019-09-03	
Conductivity (EC)	**599**	2.0	µS/cm	2019-09-03	
pH	**8.10**	0.10	pH units	2019-09-03	HT2
Solids, Total Suspended	**7.4**	2.0	mg/L	2019-09-04	HT1
Temperature, at pH	**22.1**		°C	2019-09-03	HT2
Total Metals					
Aluminum, total	**0.0434**	0.0050	mg/L	2019-08-31	
Antimony, total	**0.00280**	0.00020	mg/L	2019-08-31	
Arsenic, total	**0.00563**	0.00050	mg/L	2019-08-31	
Barium, total	**0.0622**	0.0050	mg/L	2019-08-31	
Beryllium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, total	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, total	**0.0276**	0.0050	mg/L	2019-08-31	
Cadmium, total	**0.000035**	0.000010	mg/L	2019-08-31	
Calcium, total	**76.3**	0.20	mg/L	2019-08-31	
Chromium, total	**0.00060**	0.00050	mg/L	2019-08-31	
Cobalt, total	**0.00073**	0.00010	mg/L	2019-08-31	
Copper, total	**0.00166**	0.00040	mg/L	2019-08-31	
Iron, total	**0.315**	0.010	mg/L	2019-08-31	
Lead, total	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, total	**0.0159**	0.00010	mg/L	2019-08-31	
Magnesium, total	**33.5**	0.010	mg/L	2019-08-31	
Manganese, total	**0.0634**	0.00020	mg/L	2019-08-31	
Mercury, total	< 0.000010	0.000010	mg/L	2019-09-03	
Molybdenum, total	**0.00366**	0.00010	mg/L	2019-08-31	
Nickel, total	**0.00308**	0.00040	mg/L	2019-08-31	
Phosphorus, total	< 0.050	0.050	mg/L	2019-08-31	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-1 (BC-01) (9082964-01) | Matrix: Water | Sampled: 2019-08-27 13:20, Continued					
Total Metals, Continued					
Potassium, total	**1.50**	0.10	mg/L	2019-08-31	
Selenium, total	**0.00188**	0.00050	mg/L	2019-08-31	
Silicon, total	**6.3**	1.0	mg/L	2019-08-31	
Silver, total	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, total	**5.14**	0.10	mg/L	2019-08-31	
Strontium, total	**0.396**	0.0010	mg/L	2019-08-31	
Sulfur, total	**64.2**	3.0	mg/L	2019-08-31	
Tellurium, total	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, total	< 0.000020	0.000020	mg/L	2019-08-31	
Thorium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, total	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, total	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, total	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, total	**0.00314**	0.000020	mg/L	2019-08-31	
Vanadium, total	**0.0015**	0.0010	mg/L	2019-08-31	
Zinc, total	**0.0048**	0.0040	mg/L	2019-08-31	
Zirconium, total	**0.00011**	0.00010	mg/L	2019-08-31	
2019T26-2 (BC-32) (9082964-02) | Matrix: Water | Sampled: 2019-08-27 18:09					
Anions					
Chloride	**0.35**	0.10	mg/L	2019-08-31	
Fluoride	**0.27**	0.10	mg/L	2019-08-31	
Nitrate+Nitrite (as N)	**0.0980**	0.0050	mg/L	2019-09-03	
Nitrite (as N)	< 0.0050	0.0050	mg/L	2019-08-30	
Sulfate	**153**	1.0	mg/L	2019-09-02	
Calculated Parameters					
Hardness, Total (as CaCO3)	**335**	0.500	mg/L	N/A	
Ammonia, Un-Ionized (as N)	**0.002**	0.001	mg/L	2019-09-06	
Nitrate (as N)	**0.0980**	0.0100	mg/L	N/A	
Solids, Total Dissolved	**396**	10	mg/L	2019-09-06	
Dissolved Metals					
Aluminum, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	
Antimony, dissolved	**0.0100**	0.00020	mg/L	2019-08-31	
Arsenic, dissolved	**0.00210**	0.00050	mg/L	2019-08-31	
Barium, dissolved	**0.0652**	0.0050	mg/L	2019-08-31	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, dissolved	**0.0276**	0.0050	mg/L	2019-08-31	
Cadmium, dissolved	**0.000078**	0.000010	mg/L	2019-08-31	
Calcium, dissolved	**80.5**	0.20	mg/L	2019-08-31	

TEST RESULTS

REPORTED TO Yukon Government - Water Resources
PROJECT Brewery Creek

WORK ORDER 9082964
REPORTED 2019-09-23 18:38

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-2 (BC-32) (9082964-02) | Matrix: Water | Sampled: 2019-08-27 18:09, Continued					
Dissolved Metals, Continued					
Chromium, dissolved	**0.00064**	0.00050	mg/L	2019-08-31	
Cobalt, dissolved	**0.00038**	0.00010	mg/L	2019-08-31	
Copper, dissolved	**0.00064**	0.00040	mg/L	2019-08-31	
Iron, dissolved	**0.122**	0.010	mg/L	2019-08-31	
Lead, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, dissolved	**0.0101**	0.00010	mg/L	2019-08-31	
Magnesium, dissolved	**32.5**	0.010	mg/L	2019-08-31	
Manganese, dissolved	**0.0976**	0.00020	mg/L	2019-08-31	
Mercury, dissolved	< 0.000010	0.000010	mg/L	2019-09-04	
Molybdenum, dissolved	**0.00348**	0.00010	mg/L	2019-08-31	
Nickel, dissolved	**0.00303**	0.00040	mg/L	2019-08-31	
Phosphorus, dissolved	< 0.050	0.050	mg/L	2019-08-31	
Potassium, dissolved	**2.02**	0.10	mg/L	2019-08-31	
Selenium, dissolved	**0.00197**	0.00050	mg/L	2019-08-31	
Silicon, dissolved	**3.9**	1.0	mg/L	2019-08-31	
Silver, dissolved	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, dissolved	**1.43**	0.10	mg/L	2019-08-31	
Strontium, dissolved	**0.469**	0.0010	mg/L	2019-08-31	
Sulfur, dissolved	**55.2**	3.0	mg/L	2019-08-31	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, dissolved	< 0.000020	0.000020	mg/L	2019-08-31	
Thorium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, dissolved	**0.00293**	0.000020	mg/L	2019-08-31	
Vanadium, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, dissolved	**0.0081**	0.0040	mg/L	2019-08-31	
Zirconium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
General Parameters					
Alkalinity, Total (as CaCO3)	**205**	1.0	mg/L	2019-09-03	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Bicarbonate (as CaCO3)	**205**	1.0	mg/L	2019-09-03	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Ammonia, Total (as N)	**0.048**	0.020	mg/L	2019-09-03	
Conductivity (EC)	**636**	2.0	µS/cm	2019-09-03	
Cyanide, Total	< 0.0020	0.0020	mg/L	2019-09-03	
Cyanide, Weak Acid Dissociable	< 0.0020	0.0020	mg/L	2019-09-05	
pH	**7.96**	0.10	pH units	2019-09-03	HT2
Solids, Total Suspended	< 2.0	2.0	mg/L	2019-09-04	HT1
Temperature, at pH	**22.2**		°C	2019-09-03	HT2

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-2 (BC-32) (9082964-02) | Matrix: Water | Sampled: 2019-08-27 18:09, Continued					
Total Metals					
Aluminum, total	**0.0074**	0.0050	mg/L	2019-08-31	
Antimony, total	**0.0101**	0.00020	mg/L	2019-08-31	
Arsenic, total	**0.00258**	0.00050	mg/L	2019-08-31	
Barium, total	**0.0673**	0.0050	mg/L	2019-08-31	
Beryllium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, total	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, total	**0.0252**	0.0050	mg/L	2019-08-31	
Cadmium, total	**0.000090**	0.000010	mg/L	2019-08-31	
Calcium, total	**85.3**	0.20	mg/L	2019-08-31	
Chromium, total	**0.00053**	0.00050	mg/L	2019-08-31	
Cobalt, total	**0.00042**	0.00010	mg/L	2019-08-31	
Copper, total	**0.00052**	0.00040	mg/L	2019-08-31	
Iron, total	**0.188**	0.010	mg/L	2019-08-31	
Lead, total	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, total	**0.0106**	0.00010	mg/L	2019-08-31	
Magnesium, total	**36.0**	0.010	mg/L	2019-08-31	
Manganese, total	**0.108**	0.00020	mg/L	2019-08-31	
Mercury, total	< 0.000010	0.000010	mg/L	2019-09-03	
Molybdenum, total	**0.00364**	0.00010	mg/L	2019-08-31	
Nickel, total	**0.00382**	0.00040	mg/L	2019-08-31	
Phosphorus, total	< 0.050	0.050	mg/L	2019-08-31	
Potassium, total	**2.19**	0.10	mg/L	2019-08-31	
Selenium, total	**0.00216**	0.00050	mg/L	2019-08-31	
Silicon, total	**4.3**	1.0	mg/L	2019-08-31	
Silver, total	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, total	**1.91**	0.10	mg/L	2019-08-31	
Strontium, total	**0.493**	0.0010	mg/L	2019-08-31	
Sulfur, total	**58.2**	3.0	mg/L	2019-08-31	
Tellurium, total	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, total	< 0.000020	0.000020	mg/L	2019-08-31	
Thorium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, total	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, total	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, total	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, total	**0.00299**	0.000020	mg/L	2019-08-31	
Vanadium, total	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, total	**0.0079**	0.0040	mg/L	2019-08-31	
Zirconium, total	< 0.00010	0.00010	mg/L	2019-08-31	
2019T26-3 (BC-28a) (9082964-03) | Matrix: Water | Sampled: 2019-08-28 07:43					
Anions					

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-3 (BC-28a) (9082964-03) | Matrix: Water | Sampled: 2019-08-28 07:43, Continued					
Anions, Continued					
Chloride	**28.5**	0.10	mg/L	2019-08-31	
Fluoride	< 0.10	0.10	mg/L	2019-08-31	
Nitrate+Nitrite (as N)	**351**	0.0050	mg/L	2019-09-03	
Nitrite (as N)	< 0.0050	0.0050	mg/L	2019-08-30	
Sulfate	**927**	1.0	mg/L	2019-09-02	
Calculated Parameters					
Hardness, Total (as CaCO3)	**1330**	0.500	mg/L	N/A	
Ammonia, Un-Ionized (as N)	**0.001**	0.001	mg/L	2019-09-06	
Nitrate (as N)	**351**	2.50	mg/L	N/A	
Solids, Total Dissolved	**3530**	10	mg/L	2019-09-06	
Dissolved Metals					
Aluminum, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	
Antimony, dissolved	**2.15**	0.00020	mg/L	2019-08-31	
Arsenic, dissolved	**0.304**	0.00050	mg/L	2019-08-31	
Barium, dissolved	**0.0409**	0.0050	mg/L	2019-08-31	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, dissolved	**0.0274**	0.0050	mg/L	2019-08-31	
Cadmium, dissolved	**0.000351**	0.000010	mg/L	2019-08-31	
Calcium, dissolved	**377**	0.20	mg/L	2019-08-31	
Chromium, dissolved	**0.00099**	0.00050	mg/L	2019-08-31	
Cobalt, dissolved	**0.755**	0.00010	mg/L	2019-08-31	
Copper, dissolved	**0.00187**	0.00040	mg/L	2019-08-31	
Iron, dissolved	**0.191**	0.010	mg/L	2019-08-31	
Lead, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, dissolved	**0.00631**	0.00010	mg/L	2019-08-31	
Magnesium, dissolved	**93.2**	0.010	mg/L	2019-08-31	
Manganese, dissolved	**0.0242**	0.00020	mg/L	2019-08-31	
Mercury, dissolved	**0.000025**	0.000010	mg/L	2019-09-04	
Molybdenum, dissolved	**0.0168**	0.00010	mg/L	2019-08-31	
Nickel, dissolved	**0.00996**	0.00040	mg/L	2019-08-31	
Phosphorus, dissolved	< 0.050	0.050	mg/L	2019-08-31	
Potassium, dissolved	**5.59**	0.10	mg/L	2019-08-31	
Selenium, dissolved	**0.178**	0.00050	mg/L	2019-08-31	
Silicon, dissolved	**5.1**	1.0	mg/L	2019-08-31	
Silver, dissolved	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, dissolved	**462**	0.10	mg/L	2019-08-31	
Strontium, dissolved	**1.93**	0.0010	mg/L	2019-08-31	
Sulfur, dissolved	**344**	3.0	mg/L	2019-08-31	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, dissolved	**0.000369**	0.000020	mg/L	2019-08-31	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-3 (BC-28a) (9082964-03) | Matrix: Water | Sampled: 2019-08-28 07:43, Continued					
Dissolved Metals, Continued					
Thorium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, dissolved	**0.0287**	0.000020	mg/L	2019-08-31	
Vanadium, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, dissolved	**0.0174**	0.0040	mg/L	2019-08-31	
Zirconium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
General Parameters					
Alkalinity, Total (as CaCO3)	**139**	1.0	mg/L	2019-09-03	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Bicarbonate (as CaCO3)	**139**	1.0	mg/L	2019-09-03	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Ammonia, Total (as N)	**0.046**	0.020	mg/L	2019-09-03	
Conductivity (EC)	**4360**	2.0	µS/cm	2019-09-03	
Cyanide, Total	**0.574**	0.0020	mg/L	2019-09-04	
Cyanide, Weak Acid Dissociable	**0.0404**	0.0020	mg/L	2019-09-05	
pH	**7.70**	0.10	pH units	2019-09-03	HT2
Solids, Total Suspended	**3.2**	2.0	mg/L	2019-09-04	
Temperature, at pH	**22.3**		°C	2019-09-03	HT2
Total Metals					
Aluminum, total	**0.0096**	0.0050	mg/L	2019-08-31	
Antimony, total	**2.08**	0.00020	mg/L	2019-08-31	
Arsenic, total	**0.306**	0.00050	mg/L	2019-08-31	
Barium, total	**0.0402**	0.0050	mg/L	2019-08-31	
Beryllium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, total	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, total	**0.0287**	0.0050	mg/L	2019-08-31	
Cadmium, total	**0.000378**	0.000010	mg/L	2019-08-31	
Calcium, total	**381**	0.20	mg/L	2019-08-31	
Chromium, total	**0.00094**	0.00050	mg/L	2019-08-31	
Cobalt, total	**0.795**	0.00010	mg/L	2019-08-31	
Copper, total	**0.00193**	0.00040	mg/L	2019-08-31	
Iron, total	**0.248**	0.010	mg/L	2019-08-31	
Lead, total	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, total	**0.00641**	0.00010	mg/L	2019-08-31	
Magnesium, total	**102**	0.010	mg/L	2019-08-31	
Manganese, total	**0.0259**	0.00020	mg/L	2019-08-31	
Mercury, total	**0.000011**	0.000010	mg/L	2019-09-03	
Molybdenum, total	**0.0173**	0.00010	mg/L	2019-08-31	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-3 (BC-28a) (9082964-03) | Matrix: Water | Sampled: 2019-08-28 07:43, Continued					
Total Metals, Continued					
Nickel, total	**0.0110**	0.00040	mg/L	2019-08-31	
Phosphorus, total	**0.075**	0.050	mg/L	2019-08-31	
Potassium, total	**5.94**	0.10	mg/L	2019-08-31	
Selenium, total	**0.188**	0.00050	mg/L	2019-08-31	
Silicon, total	**5.4**	1.0	mg/L	2019-08-31	
Silver, total	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, total	**514**	0.10	mg/L	2019-08-31	
Strontium, total	**1.91**	0.0010	mg/L	2019-08-31	
Sulfur, total	**355**	3.0	mg/L	2019-08-31	
Tellurium, total	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, total	**0.000348**	0.000020	mg/L	2019-08-31	
Thorium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, total	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, total	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, total	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, total	**0.0280**	0.000020	mg/L	2019-08-31	
Vanadium, total	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, total	**0.0170**	0.0040	mg/L	2019-08-31	
Zirconium, total	< 0.00010	0.00010	mg/L	2019-08-31	
2019T26-4 (BC-19) (9082964-04) | Matrix: Water | Sampled: 2019-08-27 10:00					
Anions					
Chloride	**0.56**	0.10	mg/L	2019-08-31	
Fluoride	**0.36**	0.10	mg/L	2019-08-31	
Nitrate+Nitrite (as N)	**1.83**	0.0050	mg/L	2019-09-03	
Nitrite (as N)	< 0.0050	0.0050	mg/L	2019-08-30	
Sulfate	**608**	1.0	mg/L	2019-09-02	
Calculated Parameters					
Hardness, Total (as CaCO3)	**831**	0.500	mg/L	N/A	
Ammonia, Un-Ionized (as N)	< 0.001	0.001	mg/L	2019-09-06	
Nitrate (as N)	**1.83**	0.0550	mg/L	N/A	
Solids, Total Dissolved	**1080**	10	mg/L	2019-09-06	
Dissolved Metals					
Aluminum, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	
Antimony, dissolved	**0.00051**	0.00020	mg/L	2019-08-31	
Arsenic, dissolved	< 0.00050	0.00050	mg/L	2019-08-31	
Barium, dissolved	**0.0063**	0.0050	mg/L	2019-08-31	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, dissolved	**0.0354**	0.0050	mg/L	2019-08-31	

TEST RESULTS

REPORTED TO Yukon Government - Water Resources
PROJECT Brewery Creek

WORK ORDER 9082964
REPORTED 2019-09-23 18:38

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-4 (BC-19) (9082964-04) | Matrix: Water | Sampled: 2019-08-27 10:00, Continued					
Dissolved Metals, Continued					
Cadmium, dissolved	**0.00181**	0.000010	mg/L	2019-08-31	
Calcium, dissolved	**190**	0.20	mg/L	2019-08-31	
Chromium, dissolved	**0.00051**	0.00050	mg/L	2019-08-31	
Cobalt, dissolved	**0.00295**	0.00010	mg/L	2019-08-31	
Copper, dissolved	< 0.00040	0.00040	mg/L	2019-08-31	
Iron, dissolved	< 0.010	0.010	mg/L	2019-08-31	
Lead, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, dissolved	**0.0477**	0.00010	mg/L	2019-08-31	
Magnesium, dissolved	**86.4**	0.010	mg/L	2019-08-31	
Manganese, dissolved	**0.474**	0.00020	mg/L	2019-08-31	
Mercury, dissolved	< 0.000010	0.000010	mg/L	2019-09-04	
Molybdenum, dissolved	**0.00015**	0.00010	mg/L	2019-08-31	
Nickel, dissolved	**0.00860**	0.00040	mg/L	2019-08-31	
Phosphorus, dissolved	< 0.050	0.050	mg/L	2019-08-31	
Potassium, dissolved	**2.73**	0.10	mg/L	2019-08-31	
Selenium, dissolved	**0.00550**	0.00050	mg/L	2019-08-31	
Silicon, dissolved	**9.5**	1.0	mg/L	2019-08-31	
Silver, dissolved	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, dissolved	**11.4**	0.10	mg/L	2019-08-31	
Strontium, dissolved	**0.658**	0.0010	mg/L	2019-08-31	
Sulfur, dissolved	**216**	3.0	mg/L	2019-08-31	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, dissolved	**0.000084**	0.000020	mg/L	2019-08-31	
Thorium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, dissolved	**0.000964**	0.000020	mg/L	2019-08-31	
Vanadium, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, dissolved	**0.0709**	0.0040	mg/L	2019-08-31	
Zirconium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
General Parameters					
Alkalinity, Total (as CaCO3)	**274**	1.0	mg/L	2019-09-03	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Bicarbonate (as CaCO3)	**274**	1.0	mg/L	2019-09-03	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Ammonia, Total (as N)	**0.049**	0.020	mg/L	2019-09-03	
Conductivity (EC)	**1450**	2.0	µS/cm	2019-09-03	
Cyanide, Total	< 0.0020	0.0020	mg/L	2019-09-04	
Cyanide, Weak Acid Dissociable	< 0.0020	0.0020	mg/L	2019-09-05	
pH	**6.98**	0.10	pH units	2019-09-03	HT2

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-4 (BC-19) (9082964-04) | Matrix: Water | Sampled: 2019-08-27 10:00, Continued					
General Parameters, Continued					
Temperature, at pH	**22.1**		°C	2019-09-03	HT2
2019T26-5 (BC-66) (9082964-05) | Matrix: Water | Sampled: 2019-08-27 12:30					
Anions					
Chloride	**3.94**	0.10	mg/L	2019-08-31	
Fluoride	**0.52**	0.10	mg/L	2019-08-31	
Nitrate+Nitrite (as N)	**20.0**	0.0050	mg/L	2019-09-03	
Nitrite (as N)	**0.0107**	0.0050	mg/L	2019-08-30	
Sulfate	**37.2**	1.0	mg/L	2019-08-31	
Calculated Parameters					
Hardness, Total (as CaCO3)	**390**	0.500	mg/L	N/A	
Ammonia, Un-Ionized (as N)	**0.001**	0.001	mg/L	2019-09-06	
Nitrate (as N)	**20.0**	0.255	mg/L	N/A	
Solids, Total Dissolved	**453**	10	mg/L	2019-09-06	
Dissolved Metals					
Aluminum, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	
Antimony, dissolved	**0.00033**	0.00020	mg/L	2019-08-31	
Arsenic, dissolved	< 0.00050	0.00050	mg/L	2019-08-31	
Barium, dissolved	**0.0495**	0.0050	mg/L	2019-08-31	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, dissolved	**0.0205**	0.0050	mg/L	2019-08-31	
Cadmium, dissolved	< 0.000010	0.000010	mg/L	2019-08-31	
Calcium, dissolved	**74.1**	0.20	mg/L	2019-08-31	
Chromium, dissolved	**0.00052**	0.00050	mg/L	2019-08-31	
Cobalt, dissolved	**0.0611**	0.00010	mg/L	2019-08-31	
Copper, dissolved	< 0.00040	0.00040	mg/L	2019-08-31	
Iron, dissolved	< 0.010	0.010	mg/L	2019-08-31	
Lead, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, dissolved	**0.0219**	0.00010	mg/L	2019-08-31	
Magnesium, dissolved	**49.8**	0.010	mg/L	2019-08-31	
Manganese, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Mercury, dissolved	< 0.000010	0.000010	mg/L	2019-09-04	
Molybdenum, dissolved	**0.00015**	0.00010	mg/L	2019-08-31	
Nickel, dissolved	< 0.00040	0.00040	mg/L	2019-08-31	
Phosphorus, dissolved	< 0.050	0.050	mg/L	2019-08-31	
Potassium, dissolved	**2.42**	0.10	mg/L	2019-08-31	
Selenium, dissolved	**0.0123**	0.00050	mg/L	2019-08-31	
Silicon, dissolved	**5.4**	1.0	mg/L	2019-08-31	
Silver, dissolved	< 0.000050	0.000050	mg/L	2019-08-31	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-5 (BC-66) (9082964-05) | Matrix: Water | Sampled: 2019-08-27 12:30, Continued					
Dissolved Metals, Continued					
Sodium, dissolved	**10.6**	0.10	mg/L	2019-08-31	
Strontium, dissolved	**0.433**	0.0010	mg/L	2019-08-31	
Sulfur, dissolved	**12.8**	3.0	mg/L	2019-08-31	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, dissolved	< 0.000020	0.000020	mg/L	2019-08-31	
Thorium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, dissolved	**0.00147**	0.000020	mg/L	2019-08-31	
Vanadium, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, dissolved	< 0.0040	0.0040	mg/L	2019-08-31	
Zirconium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
General Parameters					
Alkalinity, Total (as CaCO3)	**305**	1.0	mg/L	2019-09-03	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Bicarbonate (as CaCO3)	**305**	1.0	mg/L	2019-09-03	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Ammonia, Total (as N)	**0.047**	0.020	mg/L	2019-09-03	
Conductivity (EC)	**791**	2.0	µS/cm	2019-09-03	
Cyanide, Total	**0.0046**	0.0020	mg/L	2019-09-04	
Cyanide, Weak Acid Dissociable	**0.0021**	0.0020	mg/L	2019-09-05	
pH	**7.78**	0.10	pH units	2019-09-03	HT2
Temperature, at pH	**21.8**		°C	2019-09-03	HT2
2019T26-6 (BC-21) (9082964-06) | Matrix: Water | Sampled: 2019-08-27 14:45					
Anions					
Chloride	**0.62**	0.10	mg/L	2019-08-31	
Fluoride	**0.26**	0.10	mg/L	2019-08-31	
Nitrate+Nitrite (as N)	**0.0454**	0.0050	mg/L	2019-09-03	
Nitrite (as N)	< 0.0050	0.0050	mg/L	2019-08-30	
Sulfate	**54.7**	1.0	mg/L	2019-08-31	
Calculated Parameters					
Hardness, Total (as CaCO3)	**237**	0.500	mg/L	N/A	
Ammonia, Un-Ionized (as N)	< 0.001	0.001	mg/L	2019-09-06	
Nitrate (as N)	**0.0454**	0.0100	mg/L	N/A	
Solids, Total Dissolved	**269**	10	mg/L	2019-09-06	
Dissolved Metals					

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-6 (BC-21) (9082964-06) | Matrix: Water | Sampled: 2019-08-27 14:45, Continued					
Dissolved Metals, Continued					
Aluminum, dissolved	**0.0057**	0.0050	mg/L	2019-08-31	
Antimony, dissolved	**0.00027**	0.00020	mg/L	2019-08-31	
Arsenic, dissolved	**0.00324**	0.00050	mg/L	2019-08-31	
Barium, dissolved	**0.0240**	0.0050	mg/L	2019-08-31	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, dissolved	**0.0373**	0.0050	mg/L	2019-08-31	
Cadmium, dissolved	**0.000046**	0.000010	mg/L	2019-08-31	
Calcium, dissolved	**38.1**	0.20	mg/L	2019-08-31	
Chromium, dissolved	**0.00051**	0.00050	mg/L	2019-08-31	
Cobalt, dissolved	**0.00016**	0.00010	mg/L	2019-08-31	
Copper, dissolved	< 0.00040	0.00040	mg/L	2019-08-31	
Iron, dissolved	**0.206**	0.010	mg/L	2019-08-31	
Lead, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, dissolved	**0.0213**	0.00010	mg/L	2019-08-31	
Magnesium, dissolved	**34.3**	0.010	mg/L	2019-08-31	
Manganese, dissolved	**0.200**	0.00020	mg/L	2019-08-31	
Mercury, dissolved	< 0.000010	0.000010	mg/L	2019-09-04	
Molybdenum, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Nickel, dissolved	**0.00042**	0.00040	mg/L	2019-08-31	
Phosphorus, dissolved	< 0.050	0.050	mg/L	2019-08-31	
Potassium, dissolved	**2.57**	0.10	mg/L	2019-08-31	
Selenium, dissolved	**0.00611**	0.00050	mg/L	2019-08-31	
Silicon, dissolved	**4.9**	1.0	mg/L	2019-08-31	
Silver, dissolved	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, dissolved	**7.35**	0.10	mg/L	2019-08-31	
Strontium, dissolved	**0.213**	0.0010	mg/L	2019-08-31	
Sulfur, dissolved	**18.6**	3.0	mg/L	2019-08-31	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, dissolved	< 0.000020	0.000020	mg/L	2019-08-31	
Thorium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, dissolved	**0.000260**	0.000020	mg/L	2019-08-31	
Vanadium, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, dissolved	< 0.0040	0.0040	mg/L	2019-08-31	
Zirconium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
General Parameters					
Alkalinity, Total (as CaCO3)	**214**	1.0	mg/L	2019-09-03	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Bicarbonate (as CaCO3)	**214**	1.0	mg/L	2019-09-03	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-6 (BC-21) (9082964-06) | Matrix: Water | Sampled: 2019-08-27 14:45, Continued					
General Parameters, Continued					
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Ammonia, Total (as N)	**0.098**	0.020	mg/L	2019-09-03	
Conductivity (EC)	**469**	2.0	µS/cm	2019-09-03	
Cyanide, Total	< 0.0020	0.0020	mg/L	2019-09-03	
Cyanide, Weak Acid Dissociable	< 0.0020	0.0020	mg/L	2019-09-05	
pH	**7.35**	0.10	pH units	2019-09-03	HT2
Temperature, at pH	**21.9**		°C	2019-09-03	HT2
2019T26-7 (BC-03) (9082964-07) | Matrix: Water | Sampled: 2019-08-28 09:15					
Anions					
Chloride	< 0.10	0.10	mg/L	2019-08-31	
Fluoride	< 0.10	0.10	mg/L	2019-08-31	
Nitrate+Nitrite (as N)	< 0.0050	0.0050	mg/L	2019-09-03	
Nitrite (as N)	< 0.0050	0.0050	mg/L	2019-08-30	
Sulfate	< 1.0	1.0	mg/L	2019-08-31	
Calculated Parameters					
Hardness, Total (as CaCO3)	< 0.500	0.500	mg/L	N/A	
Ammonia, Un-Ionized (as N)	< 0.001	0.001	mg/L	2019-09-06	
Nitrate (as N)	< 0.0100	0.0100	mg/L	N/A	
Solids, Total Dissolved	< 10	10	mg/L	2019-09-06	
Dissolved Metals					
Aluminum, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	
Antimony, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Arsenic, dissolved	< 0.00050	0.00050	mg/L	2019-08-31	
Barium, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, dissolved	**0.0100**	0.0050	mg/L	2019-08-31	
Cadmium, dissolved	< 0.000010	0.000010	mg/L	2019-08-31	
Calcium, dissolved	< 0.20	0.20	mg/L	2019-08-31	
Chromium, dissolved	< 0.00050	0.00050	mg/L	2019-08-31	
Cobalt, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Copper, dissolved	< 0.00040	0.00040	mg/L	2019-08-31	
Iron, dissolved	< 0.010	0.010	mg/L	2019-08-31	
Lead, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Magnesium, dissolved	< 0.010	0.010	mg/L	2019-08-31	
Manganese, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Mercury, dissolved	< 0.000010	0.000010	mg/L	2019-09-04	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-7 (BC-03) (9082964-07) | Matrix: Water | Sampled: 2019-08-28 09:15, Continued					
Dissolved Metals, Continued					
Molybdenum, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Nickel, dissolved	< 0.00040	0.00040	mg/L	2019-08-31	
Phosphorus, dissolved	< 0.050	0.050	mg/L	2019-08-31	
Potassium, dissolved	< 0.10	0.10	mg/L	2019-08-31	
Selenium, dissolved	< 0.00050	0.00050	mg/L	2019-08-31	
Silicon, dissolved	< 1.0	1.0	mg/L	2019-08-31	
Silver, dissolved	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, dissolved	< 0.10	0.10	mg/L	2019-08-31	
Strontium, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Sulfur, dissolved	< 3.0	3.0	mg/L	2019-08-31	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, dissolved	< 0.000020	0.000020	mg/L	2019-08-31	
Thorium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, dissolved	< 0.000020	0.000020	mg/L	2019-08-31	
Vanadium, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, dissolved	< 0.0040	0.0040	mg/L	2019-08-31	
Zirconium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
General Parameters					
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Ammonia, Total (as N)	**0.071**	0.020	mg/L	2019-09-03	
Conductivity (EC)	< 2.0	2.0	µS/cm	2019-09-03	
Cyanide, Total	< 0.0020	0.0020	mg/L	2019-09-03	
Cyanide, Weak Acid Dissociable	< 0.0020	0.0020	mg/L	2019-09-05	
pH	**5.07**	0.10	pH units	2019-09-03	HT2
Solids, Total Suspended	< 2.0	2.0	mg/L	2019-09-04	
Temperature, at pH	**22.1**		°C	2019-09-03	HT2
Total Metals					
Aluminum, total	< 0.0050	0.0050	mg/L	2019-08-31	
Antimony, total	< 0.00020	0.00020	mg/L	2019-08-31	
Arsenic, total	< 0.00050	0.00050	mg/L	2019-08-31	
Barium, total	< 0.0050	0.0050	mg/L	2019-08-31	
Beryllium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, total	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, total	**0.0125**	0.0050	mg/L	2019-08-31	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-7 (BC-03) (9082964-07) | Matrix: Water | Sampled: 2019-08-28 09:15, Continued					
Total Metals, Continued					
Cadmium, total	< 0.000010	0.000010	mg/L	2019-08-31	
Calcium, total	< 0.20	0.20	mg/L	2019-08-31	
Chromium, total	**0.00059**	0.00050	mg/L	2019-08-31	
Cobalt, total	< 0.00010	0.00010	mg/L	2019-08-31	
Copper, total	< 0.00040	0.00040	mg/L	2019-08-31	
Iron, total	< 0.010	0.010	mg/L	2019-08-31	
Lead, total	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Magnesium, total	< 0.010	0.010	mg/L	2019-08-31	
Manganese, total	< 0.00020	0.00020	mg/L	2019-08-31	
Mercury, total	< 0.000010	0.000010	mg/L	2019-09-03	
Molybdenum, total	< 0.00010	0.00010	mg/L	2019-08-31	
Nickel, total	< 0.00040	0.00040	mg/L	2019-08-31	
Phosphorus, total	< 0.050	0.050	mg/L	2019-08-31	
Potassium, total	< 0.10	0.10	mg/L	2019-08-31	
Selenium, total	< 0.00050	0.00050	mg/L	2019-08-31	
Silicon, total	< 1.0	1.0	mg/L	2019-08-31	
Silver, total	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, total	**0.13**	0.10	mg/L	2019-08-31	
Strontium, total	< 0.0010	0.0010	mg/L	2019-08-31	
Sulfur, total	< 3.0	3.0	mg/L	2019-08-31	
Tellurium, total	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, total	< 0.000020	0.000020	mg/L	2019-08-31	
Thorium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, total	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, total	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, total	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, total	< 0.000020	0.000020	mg/L	2019-08-31	
Vanadium, total	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, total	< 0.0040	0.0040	mg/L	2019-08-31	
Zirconium, total	< 0.00010	0.00010	mg/L	2019-08-31	
2019T26-8 (BC-03) (9082964-08) | Matrix: Water | Sampled: 2019-08-28 09:17					
Anions					
Chloride	**0.36**	0.10	mg/L	2019-08-31	
Fluoride	**0.23**	0.10	mg/L	2019-08-31	
Nitrate+Nitrite (as N)	**0.108**	0.0050	mg/L	2019-09-03	
Nitrite (as N)	< 0.0050	0.0050	mg/L	2019-08-30	
Sulfate	**184**	1.0	mg/L	2019-09-02	
Calculated Parameters					

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-8 (BC-03) (9082964-08) | Matrix: Water | Sampled: 2019-08-28 09:17, Continued					
Calculated Parameters, Continued					
Hardness, Total (as CaCO3)	**330**	0.500	mg/L	N/A	
Ammonia, Un-Ionized (as N)	**0.003**	0.001	mg/L	2019-09-06	
Nitrate (as N)	**0.108**	0.0100	mg/L	N/A	
Solids, Total Dissolved	**401**	10	mg/L	2019-09-06	
Dissolved Metals					
Aluminum, dissolved	**0.0234**	0.0050	mg/L	2019-08-31	
Antimony, dissolved	**0.00402**	0.00020	mg/L	2019-08-31	
Arsenic, dissolved	**0.00143**	0.00050	mg/L	2019-08-31	
Barium, dissolved	**0.0546**	0.0050	mg/L	2019-08-31	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, dissolved	**0.0146**	0.0050	mg/L	2019-08-31	
Cadmium, dissolved	**0.000043**	0.000010	mg/L	2019-08-31	
Calcium, dissolved	**78.2**	0.20	mg/L	2019-08-31	
Chromium, dissolved	**0.00065**	0.00050	mg/L	2019-08-31	
Cobalt, dissolved	**0.00114**	0.00010	mg/L	2019-08-31	
Copper, dissolved	**0.00093**	0.00040	mg/L	2019-08-31	
Iron, dissolved	**0.085**	0.010	mg/L	2019-08-31	
Lead, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, dissolved	**0.0179**	0.00010	mg/L	2019-08-31	
Magnesium, dissolved	**32.6**	0.010	mg/L	2019-08-31	
Manganese, dissolved	**0.102**	0.00020	mg/L	2019-08-31	
Mercury, dissolved	< 0.000010	0.000010	mg/L	2019-09-04	
Molybdenum, dissolved	**0.00280**	0.00010	mg/L	2019-08-31	
Nickel, dissolved	**0.00524**	0.00040	mg/L	2019-08-31	
Phosphorus, dissolved	< 0.050	0.050	mg/L	2019-08-31	
Potassium, dissolved	**1.52**	0.10	mg/L	2019-08-31	
Selenium, dissolved	**0.00145**	0.00050	mg/L	2019-08-31	
Silicon, dissolved	**4.8**	1.0	mg/L	2019-08-31	
Silver, dissolved	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, dissolved	**3.73**	0.10	mg/L	2019-08-31	
Strontium, dissolved	**0.423**	0.0010	mg/L	2019-08-31	
Sulfur, dissolved	**66.8**	3.0	mg/L	2019-08-31	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, dissolved	< 0.000020	0.000020	mg/L	2019-08-31	
Thorium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, dissolved	**0.00275**	0.000020	mg/L	2019-08-31	
Vanadium, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, dissolved	**0.0106**	0.0040	mg/L	2019-08-31	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-8 (BC-03) (9082964-08) | Matrix: Water | Sampled: 2019-08-28 09:17, Continued					
Dissolved Metals, Continued					
Zirconium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
General Parameters					
Alkalinity, Total (as CaCO3)	**163**	1.0	mg/L	2019-09-03	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Bicarbonate (as CaCO3)	**163**	1.0	mg/L	2019-09-03	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Ammonia, Total (as N)	**0.068**	0.020	mg/L	2019-09-03	
Conductivity (EC)	**642**	2.0	µS/cm	2019-09-03	
Cyanide, Total	< 0.0020	0.0020	mg/L	2019-09-03	
Cyanide, Weak Acid Dissociable	< 0.0020	0.0020	mg/L	2019-09-05	
pH	**8.01**	0.10	pH units	2019-09-03	HT2
Solids, Total Suspended	**2.6**	2.0	mg/L	2019-09-04	
Temperature, at pH	**22.5**		°C	2019-09-03	HT2
Total Metals					
Aluminum, total	**0.0487**	0.0050	mg/L	2019-08-31	
Antimony, total	**0.00414**	0.00020	mg/L	2019-08-31	
Arsenic, total	**0.00255**	0.00050	mg/L	2019-08-31	
Barium, total	**0.0557**	0.0050	mg/L	2019-08-31	
Beryllium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, total	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, total	**0.0174**	0.0050	mg/L	2019-08-31	
Cadmium, total	**0.000056**	0.000010	mg/L	2019-08-31	
Calcium, total	**80.9**	0.20	mg/L	2019-08-31	
Chromium, total	**0.00073**	0.00050	mg/L	2019-08-31	
Cobalt, total	**0.00134**	0.00010	mg/L	2019-08-31	
Copper, total	**0.00102**	0.00040	mg/L	2019-08-31	
Iron, total	**0.374**	0.010	mg/L	2019-08-31	
Lead, total	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, total	**0.0183**	0.00010	mg/L	2019-08-31	
Magnesium, total	**35.4**	0.010	mg/L	2019-08-31	
Manganese, total	**0.115**	0.00020	mg/L	2019-08-31	
Mercury, total	< 0.000010	0.000010	mg/L	2019-09-03	
Molybdenum, total	**0.00280**	0.00010	mg/L	2019-08-31	
Nickel, total	**0.00645**	0.00040	mg/L	2019-08-31	
Phosphorus, total	< 0.050	0.050	mg/L	2019-08-31	
Potassium, total	**1.64**	0.10	mg/L	2019-08-31	
Selenium, total	**0.00152**	0.00050	mg/L	2019-08-31	
Silicon, total	**5.2**	1.0	mg/L	2019-08-31	
Silver, total	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, total	**4.41**	0.10	mg/L	2019-08-31	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-8 (BC-03) (9082964-08) | Matrix: Water | Sampled: 2019-08-28 09:17, Continued					
Total Metals, Continued					
Strontium, total	**0.430**	0.0010	mg/L	2019-08-31	
Sulfur, total	**68.1**	3.0	mg/L	2019-08-31	
Tellurium, total	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, total	< 0.000020	0.000020	mg/L	2019-08-31	
Thorium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, total	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, total	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, total	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, total	**0.00276**	0.000020	mg/L	2019-08-31	
Vanadium, total	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, total	**0.0124**	0.0040	mg/L	2019-08-31	
Zirconium, total	< 0.00010	0.00010	mg/L	2019-08-31	
2019T26-9 (BC-02) (9082964-09) | Matrix: Water | Sampled: 2019-08-28 10:01					
Anions					
Chloride	**1.76**	0.10	mg/L	2019-08-31	
Fluoride	**0.21**	0.10	mg/L	2019-08-31	
Nitrate+Nitrite (as N)	**3.59**	0.0050	mg/L	2019-09-03	
Nitrite (as N)	< 0.0050	0.0050	mg/L	2019-08-30	
Sulfate	**404**	1.0	mg/L	2019-09-02	
Calculated Parameters					
Hardness, Total (as CaCO3)	**591**	0.500	mg/L	N/A	
Ammonia, Un-Ionized (as N)	**0.002**	0.001	mg/L	2019-09-06	
Nitrate (as N)	**3.59**	0.0550	mg/L	N/A	
Solids, Total Dissolved	**767**	10	mg/L	2019-09-06	
Dissolved Metals					
Aluminum, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	
Antimony, dissolved	**0.00064**	0.00020	mg/L	2019-08-31	
Arsenic, dissolved	< 0.00050	0.00050	mg/L	2019-08-31	
Barium, dissolved	**0.0498**	0.0050	mg/L	2019-08-31	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, dissolved	**0.0166**	0.0050	mg/L	2019-08-31	
Cadmium, dissolved	**0.000016**	0.000010	mg/L	2019-08-31	
Calcium, dissolved	**139**	0.20	mg/L	2019-08-31	
Chromium, dissolved	**0.00073**	0.00050	mg/L	2019-08-31	
Cobalt, dissolved	**0.00527**	0.00010	mg/L	2019-08-31	
Copper, dissolved	**0.00063**	0.00040	mg/L	2019-08-31	
Iron, dissolved	**0.031**	0.010	mg/L	2019-08-31	
Lead, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-9 (BC-02) (9082964-09) | Matrix: Water | Sampled: 2019-08-28 10:01, Continued					
Dissolved Metals, Continued					
Lithium, dissolved	**0.0239**	0.00010	mg/L	2019-08-31	
Magnesium, dissolved	**59.1**	0.010	mg/L	2019-08-31	
Manganese, dissolved	**0.0357**	0.00020	mg/L	2019-08-31	
Mercury, dissolved	< 0.000010	0.000010	mg/L	2019-09-04	
Molybdenum, dissolved	**0.00037**	0.00010	mg/L	2019-08-31	
Nickel, dissolved	**0.00058**	0.00040	mg/L	2019-08-31	
Phosphorus, dissolved	< 0.050	0.050	mg/L	2019-08-31	
Potassium, dissolved	**2.10**	0.10	mg/L	2019-08-31	
Selenium, dissolved	**0.00616**	0.00050	mg/L	2019-08-31	
Silicon, dissolved	**6.0**	1.0	mg/L	2019-08-31	
Silver, dissolved	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, dissolved	**10.2**	0.10	mg/L	2019-08-31	
Strontium, dissolved	**0.386**	0.0010	mg/L	2019-08-31	
Sulfur, dissolved	**142**	3.0	mg/L	2019-08-31	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, dissolved	< 0.000020	0.000020	mg/L	2019-08-31	
Thorium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, dissolved	**0.00314**	0.000020	mg/L	2019-08-31	
Vanadium, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, dissolved	< 0.0040	0.0040	mg/L	2019-08-31	
Zirconium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
General Parameters					
Alkalinity, Total (as CaCO3)	**221**	1.0	mg/L	2019-09-03	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Bicarbonate (as CaCO3)	**221**	1.0	mg/L	2019-09-03	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Ammonia, Total (as N)	**0.057**	0.020	mg/L	2019-09-03	
Conductivity (EC)	**1120**	2.0	µS/cm	2019-09-03	
Cyanide, Total	< 0.0020	0.0020	mg/L	2019-09-03	
Cyanide, Weak Acid Dissociable	< 0.0020	0.0020	mg/L	2019-09-05	
pH	**7.93**	0.10	pH units	2019-09-03	HT2
Solids, Total Suspended	**7.4**	2.0	mg/L	2019-09-04	
Temperature, at pH	**23.1**		°C	2019-09-03	HT2
Total Metals					
Aluminum, total	**0.0349**	0.0050	mg/L	2019-08-31	
Antimony, total	**0.00066**	0.00020	mg/L	2019-08-31	
Arsenic, total	< 0.00050	0.00050	mg/L	2019-08-31	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-9 (BC-02) (9082964-09) | Matrix: Water | Sampled: 2019-08-28 10:01, Continued					
Total Metals, Continued					
Barium, total	**0.0518**	0.0050	mg/L	2019-08-31	
Beryllium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, total	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, total	**0.0204**	0.0050	mg/L	2019-08-31	
Cadmium, total	**0.000023**	0.000010	mg/L	2019-08-31	
Calcium, total	**146**	0.20	mg/L	2019-08-31	
Chromium, total	**0.00068**	0.00050	mg/L	2019-08-31	
Cobalt, total	**0.00816**	0.00010	mg/L	2019-08-31	
Copper, total	**0.00123**	0.00040	mg/L	2019-08-31	
Iron, total	**0.104**	0.010	mg/L	2019-08-31	
Lead, total	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, total	**0.0248**	0.00010	mg/L	2019-08-31	
Magnesium, total	**67.6**	0.010	mg/L	2019-08-31	
Manganese, total	**0.0415**	0.00020	mg/L	2019-08-31	
Mercury, total	< 0.000010	0.000010	mg/L	2019-09-03	
Molybdenum, total	**0.00036**	0.00010	mg/L	2019-08-31	
Nickel, total	**0.00124**	0.00040	mg/L	2019-08-31	
Phosphorus, total	< 0.050	0.050	mg/L	2019-08-31	
Potassium, total	**2.30**	0.10	mg/L	2019-08-31	
Selenium, total	**0.00663**	0.00050	mg/L	2019-08-31	
Silicon, total	**6.7**	1.0	mg/L	2019-08-31	
Silver, total	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, total	**12.1**	0.10	mg/L	2019-08-31	
Strontium, total	**0.401**	0.0010	mg/L	2019-08-31	
Sulfur, total	**154**	3.0	mg/L	2019-08-31	
Tellurium, total	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, total	< 0.000020	0.000020	mg/L	2019-08-31	
Thorium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, total	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, total	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, total	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, total	**0.00319**	0.000020	mg/L	2019-08-31	
Vanadium, total	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, total	**0.0042**	0.0040	mg/L	2019-08-31	
Zirconium, total	< 0.00010	0.00010	mg/L	2019-08-31	
2019T26-10 (LAURA150) (9082964-10) | Matrix: Water | Sampled: 2019-08-28 10:31					
Anions					
Chloride	**1.03**	0.10	mg/L	2019-08-31	
Fluoride	**0.25**	0.10	mg/L	2019-08-31	
Nitrate+Nitrite (as N)	**1.53**	0.0050	mg/L	2019-09-03	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-10 (LAURA150) (9082964-10) | Matrix: Water | Sampled: 2019-08-28 10:31, Continued					
Anions, Continued					
Nitrite (as N)	< 0.0050	0.0050	mg/L	2019-08-30	
Sulfate	**288**	1.0	mg/L	2019-09-02	
Calculated Parameters					
Hardness, Total (as CaCO3)	**410**	0.500	mg/L	N/A	
Ammonia, Un-Ionized (as N)	**0.003**	0.001	mg/L	2019-09-06	
Nitrate (as N)	**1.53**	0.0300	mg/L	N/A	
Solids, Total Dissolved	**568**	10	mg/L	2019-09-06	
Dissolved Metals					
Aluminum, dissolved	**0.0135**	0.0050	mg/L	2019-08-31	
Antimony, dissolved	**0.00280**	0.00020	mg/L	2019-08-31	
Arsenic, dissolved	**0.00103**	0.00050	mg/L	2019-08-31	
Barium, dissolved	**0.0542**	0.0050	mg/L	2019-08-31	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, dissolved	**0.0140**	0.0050	mg/L	2019-08-31	
Cadmium, dissolved	**0.000030**	0.000010	mg/L	2019-08-31	
Calcium, dissolved	**96.5**	0.20	mg/L	2019-08-31	
Chromium, dissolved	**0.00051**	0.00050	mg/L	2019-08-31	
Cobalt, dissolved	**0.00236**	0.00010	mg/L	2019-08-31	
Copper, dissolved	**0.00079**	0.00040	mg/L	2019-08-31	
Iron, dissolved	**0.128**	0.010	mg/L	2019-08-31	
Lead, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, dissolved	**0.0189**	0.00010	mg/L	2019-08-31	
Magnesium, dissolved	**40.9**	0.010	mg/L	2019-08-31	
Manganese, dissolved	**0.130**	0.00020	mg/L	2019-08-31	
Mercury, dissolved	< 0.000010	0.000010	mg/L	2019-09-04	
Molybdenum, dissolved	**0.00193**	0.00010	mg/L	2019-08-31	
Nickel, dissolved	**0.00335**	0.00040	mg/L	2019-08-31	
Phosphorus, dissolved	< 0.050	0.050	mg/L	2019-08-31	
Potassium, dissolved	**1.66**	0.10	mg/L	2019-08-31	
Selenium, dissolved	**0.00249**	0.00050	mg/L	2019-08-31	
Silicon, dissolved	**5.1**	1.0	mg/L	2019-08-31	
Silver, dissolved	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, dissolved	**5.91**	0.10	mg/L	2019-08-31	
Strontium, dissolved	**0.409**	0.0010	mg/L	2019-08-31	
Sulfur, dissolved	**91.7**	3.0	mg/L	2019-08-31	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, dissolved	< 0.000020	0.000020	mg/L	2019-08-31	
Thorium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-10 (LAURA150) (9082964-10) | Matrix: Water | Sampled: 2019-08-28 10:31, Continued					
Dissolved Metals, Continued					
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, dissolved	**0.00279**	0.000020	mg/L	2019-08-31	
Vanadium, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, dissolved	**0.0077**	0.0040	mg/L	2019-08-31	
Zirconium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
General Parameters					
Alkalinity, Total (as CaCO3)	**208**	1.0	mg/L	2019-09-03	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Bicarbonate (as CaCO3)	**208**	1.0	mg/L	2019-09-03	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Ammonia, Total (as N)	**0.077**	0.020	mg/L	2019-09-03	
Conductivity (EC)	**868**	2.0	µS/cm	2019-09-03	
Cyanide, Total	< 0.0020	0.0020	mg/L	2019-09-03	
Cyanide, Weak Acid Dissociable	< 0.0020	0.0020	mg/L	2019-09-05	
pH	**7.97**	0.10	pH units	2019-09-03	HT2
Solids, Total Suspended	**2.4**	2.0	mg/L	2019-09-04	
Temperature, at pH	**22.7**		°C	2019-09-03	HT2
Total Metals					
Aluminum, total	**0.0315**	0.0050	mg/L	2019-08-31	
Antimony, total	**0.00276**	0.00020	mg/L	2019-08-31	
Arsenic, total	**0.00178**	0.00050	mg/L	2019-08-31	
Barium, total	**0.0561**	0.0050	mg/L	2019-08-31	
Beryllium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, total	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, total	**0.0169**	0.0050	mg/L	2019-08-31	
Cadmium, total	**0.000045**	0.000010	mg/L	2019-08-31	
Calcium, total	**101**	0.20	mg/L	2019-08-31	
Chromium, total	< 0.00050	0.00050	mg/L	2019-08-31	
Cobalt, total	**0.00334**	0.00010	mg/L	2019-08-31	
Copper, total	**0.00087**	0.00040	mg/L	2019-08-31	
Iron, total	**0.374**	0.010	mg/L	2019-08-31	
Lead, total	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, total	**0.0194**	0.00010	mg/L	2019-08-31	
Magnesium, total	**46.4**	0.010	mg/L	2019-08-31	
Manganese, total	**0.147**	0.00020	mg/L	2019-08-31	
Mercury, total	< 0.000010	0.000010	mg/L	2019-09-03	
Molybdenum, total	**0.00198**	0.00010	mg/L	2019-08-31	
Nickel, total	**0.00432**	0.00040	mg/L	2019-08-31	
Phosphorus, total	< 0.050	0.050	mg/L	2019-08-31	
Potassium, total	**1.79**	0.10	mg/L	2019-08-31	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-10 (LAURA150) (9082964-10) | Matrix: Water | Sampled: 2019-08-28 10:31, Continued					
Total Metals, Continued					
Selenium, total	**0.00279**	0.00050	mg/L	2019-08-31	
Silicon, total	**5.6**	1.0	mg/L	2019-08-31	
Silver, total	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, total	**7.10**	0.10	mg/L	2019-08-31	
Strontium, total	**0.423**	0.0010	mg/L	2019-08-31	
Sulfur, total	**97.2**	3.0	mg/L	2019-08-31	
Tellurium, total	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, total	< 0.000020	0.000020	mg/L	2019-08-31	
Thorium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, total	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, total	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, total	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, total	**0.00286**	0.000020	mg/L	2019-08-31	
Vanadium, total	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, total	**0.0084**	0.0040	mg/L	2019-08-31	
Zirconium, total	< 0.00010	0.00010	mg/L	2019-08-31	
2019T26-11 (LAURA-US) (9082964-11) | Matrix: Water | Sampled: 2019-08-28 11:33					
Anions					
Chloride	**0.24**	0.10	mg/L	2019-08-31	
Fluoride	**0.21**	0.10	mg/L	2019-08-31	
Nitrate+Nitrite (as N)	**0.146**	0.0050	mg/L	2019-09-03	
Nitrite (as N)	< 0.0050	0.0050	mg/L	2019-08-30	
Sulfate	**98.7**	1.0	mg/L	2019-09-02	
Calculated Parameters					
Hardness, Total (as CaCO3)	**213**	0.500	mg/L	N/A	
Ammonia, Un-Ionized (as N)	**0.002**	0.001	mg/L	2019-09-06	
Nitrate (as N)	**0.146**	0.0100	mg/L	N/A	
Solids, Total Dissolved	**255**	10	mg/L	2019-09-06	
Dissolved Metals					
Aluminum, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	
Antimony, dissolved	**0.0108**	0.00020	mg/L	2019-08-31	
Arsenic, dissolved	**0.00134**	0.00050	mg/L	2019-08-31	
Barium, dissolved	**0.0653**	0.0050	mg/L	2019-08-31	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, dissolved	**0.0140**	0.0050	mg/L	2019-08-31	
Cadmium, dissolved	**0.000183**	0.000010	mg/L	2019-08-31	
Calcium, dissolved	**52.5**	0.20	mg/L	2019-08-31	
Chromium, dissolved	**0.00062**	0.00050	mg/L	2019-08-31	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-11 (LAURA-US) (9082964-11) | Matrix: Water | Sampled: 2019-08-28 11:33, Continued					
Dissolved Metals, Continued					
Cobalt, dissolved	**0.00022**	0.00010	mg/L	2019-08-31	
Copper, dissolved	**0.00051**	0.00040	mg/L	2019-08-31	
Iron, dissolved	**0.274**	0.010	mg/L	2019-08-31	
Lead, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, dissolved	**0.0112**	0.00010	mg/L	2019-08-31	
Magnesium, dissolved	**19.9**	0.010	mg/L	2019-08-31	
Manganese, dissolved	**0.0496**	0.00020	mg/L	2019-08-31	
Mercury, dissolved	< 0.000010	0.000010	mg/L	2019-09-04	
Molybdenum, dissolved	**0.00194**	0.00010	mg/L	2019-08-31	
Nickel, dissolved	**0.00359**	0.00040	mg/L	2019-08-31	
Phosphorus, dissolved	< 0.050	0.050	mg/L	2019-08-31	
Potassium, dissolved	**1.32**	0.10	mg/L	2019-08-31	
Selenium, dissolved	**0.00369**	0.00050	mg/L	2019-08-31	
Silicon, dissolved	**4.0**	1.0	mg/L	2019-08-31	
Silver, dissolved	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, dissolved	**1.08**	0.10	mg/L	2019-08-31	
Strontium, dissolved	**0.336**	0.0010	mg/L	2019-08-31	
Sulfur, dissolved	**36.0**	3.0	mg/L	2019-08-31	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, dissolved	< 0.000020	0.000020	mg/L	2019-08-31	
Thorium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, dissolved	**0.00125**	0.000020	mg/L	2019-08-31	
Vanadium, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, dissolved	**0.0153**	0.0040	mg/L	2019-08-31	
Zirconium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
General Parameters					
Alkalinity, Total (as CaCO3)	**132**	1.0	mg/L	2019-09-03	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Bicarbonate (as CaCO3)	**132**	1.0	mg/L	2019-09-03	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Ammonia, Total (as N)	**0.055**	0.020	mg/L	2019-09-03	
Conductivity (EC)	**426**	2.0	µS/cm	2019-09-03	
Cyanide, Total	< 0.0020	0.0020	mg/L	2019-09-03	
Cyanide, Weak Acid Dissociable	< 0.0020	0.0020	mg/L	2019-09-05	
pH	**7.83**	0.10	pH units	2019-09-03	HT2
Solids, Total Suspended	**2.2**	2.0	mg/L	2019-09-04	
Temperature, at pH	**22.6**		°C	2019-09-03	HT2

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-11 (LAURA-US) (9082964-11) | Matrix: Water | Sampled: 2019-08-28 11:33, Continued					
Total Metals					
Aluminum, total	**0.0135**	0.0050	mg/L	2019-08-31	
Antimony, total	**0.0108**	0.00020	mg/L	2019-08-31	
Arsenic, total	**0.00156**	0.00050	mg/L	2019-08-31	
Barium, total	**0.0662**	0.0050	mg/L	2019-08-31	
Beryllium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, total	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, total	**0.0173**	0.0050	mg/L	2019-08-31	
Cadmium, total	**0.000214**	0.000010	mg/L	2019-08-31	
Calcium, total	**55.1**	0.20	mg/L	2019-08-31	
Chromium, total	**0.00053**	0.00050	mg/L	2019-08-31	
Cobalt, total	**0.00023**	0.00010	mg/L	2019-08-31	
Copper, total	**0.00066**	0.00040	mg/L	2019-08-31	
Iron, total	**0.313**	0.010	mg/L	2019-08-31	
Lead, total	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, total	**0.0115**	0.00010	mg/L	2019-08-31	
Magnesium, total	**22.5**	0.010	mg/L	2019-08-31	
Manganese, total	**0.0563**	0.00020	mg/L	2019-08-31	
Mercury, total	< 0.000010	0.000010	mg/L	2019-09-04	
Molybdenum, total	**0.00302**	0.00010	mg/L	2019-08-31	
Nickel, total	**0.00440**	0.00040	mg/L	2019-08-31	
Phosphorus, total	< 0.050	0.050	mg/L	2019-08-31	
Potassium, total	**1.44**	0.10	mg/L	2019-08-31	
Selenium, total	**0.00405**	0.00050	mg/L	2019-08-31	
Silicon, total	**4.4**	1.0	mg/L	2019-08-31	
Silver, total	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, total	**1.58**	0.10	mg/L	2019-08-31	
Strontium, total	**0.342**	0.0010	mg/L	2019-08-31	
Sulfur, total	**37.6**	3.0	mg/L	2019-08-31	
Tellurium, total	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, total	< 0.000020	0.000020	mg/L	2019-08-31	
Thorium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, total	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, total	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, total	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, total	**0.00130**	0.000020	mg/L	2019-08-31	
Vanadium, total	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, total	**0.0159**	0.0040	mg/L	2019-08-31	
Zirconium, total	< 0.00010	0.00010	mg/L	2019-08-31	
2019T26-12 (LAURA-US) (9082964-12) | Matrix: Water | Sampled: 2019-08-28 11:33					
Anions					

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-12 (LAURA-US) (9082964-12) | Matrix: Water | Sampled: 2019-08-28 11:33, Continued					
Anions, Continued					
Chloride	**0.25**	0.10	mg/L	2019-08-31	
Fluoride	**0.21**	0.10	mg/L	2019-08-31	
Nitrate+Nitrite (as N)	**0.139**	0.0050	mg/L	2019-09-03	
Nitrite (as N)	< 0.0050	0.0050	mg/L	2019-08-30	
Sulfate	**98.9**	1.0	mg/L	2019-09-02	
Calculated Parameters					
Hardness, Total (as CaCO3)	**217**	0.500	mg/L	N/A	
Ammonia, Un-Ionized (as N)	**0.001**	0.001	mg/L	2019-09-06	
Nitrate (as N)	**0.139**	0.0100	mg/L	N/A	
Solids, Total Dissolved	**257**	10	mg/L	2019-09-06	
Dissolved Metals					
Aluminum, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	
Antimony, dissolved	**0.0109**	0.00020	mg/L	2019-08-31	
Arsenic, dissolved	**0.00128**	0.00050	mg/L	2019-08-31	
Barium, dissolved	**0.0660**	0.0050	mg/L	2019-08-31	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, dissolved	**0.0147**	0.0050	mg/L	2019-08-31	
Cadmium, dissolved	**0.000179**	0.000010	mg/L	2019-08-31	
Calcium, dissolved	**53.4**	0.20	mg/L	2019-08-31	
Chromium, dissolved	**0.00072**	0.00050	mg/L	2019-08-31	
Cobalt, dissolved	**0.00023**	0.00010	mg/L	2019-08-31	
Copper, dissolved	**0.00051**	0.00040	mg/L	2019-08-31	
Iron, dissolved	**0.277**	0.010	mg/L	2019-08-31	
Lead, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, dissolved	**0.0114**	0.00010	mg/L	2019-08-31	
Magnesium, dissolved	**20.2**	0.010	mg/L	2019-08-31	
Manganese, dissolved	**0.0505**	0.00020	mg/L	2019-08-31	
Mercury, dissolved	< 0.000010	0.000010	mg/L	2019-09-04	
Molybdenum, dissolved	**0.00105**	0.00010	mg/L	2019-08-31	
Nickel, dissolved	**0.00366**	0.00040	mg/L	2019-08-31	
Phosphorus, dissolved	< 0.050	0.050	mg/L	2019-08-31	
Potassium, dissolved	**1.35**	0.10	mg/L	2019-08-31	
Selenium, dissolved	**0.00379**	0.00050	mg/L	2019-08-31	
Silicon, dissolved	**4.2**	1.0	mg/L	2019-08-31	
Silver, dissolved	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, dissolved	**1.11**	0.10	mg/L	2019-08-31	
Strontium, dissolved	**0.343**	0.0010	mg/L	2019-08-31	
Sulfur, dissolved	**36.6**	3.0	mg/L	2019-08-31	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, dissolved	< 0.000020	0.000020	mg/L	2019-08-31	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-12 (LAURA-US) (9082964-12) | Matrix: Water | Sampled: 2019-08-28 11:33, Continued					
Dissolved Metals, Continued					
Thorium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, dissolved	**0.00129**	0.000020	mg/L	2019-08-31	
Vanadium, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, dissolved	**0.0153**	0.0040	mg/L	2019-08-31	
Zirconium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
General Parameters					
Alkalinity, Total (as CaCO3)	**132**	1.0	mg/L	2019-09-03	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Bicarbonate (as CaCO3)	**132**	1.0	mg/L	2019-09-03	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Ammonia, Total (as N)	**0.041**	0.020	mg/L	2019-09-03	
Conductivity (EC)	**423**	2.0	µS/cm	2019-09-03	
Cyanide, Total	< 0.0020	0.0020	mg/L	2019-09-03	
Cyanide, Weak Acid Dissociable	< 0.0020	0.0020	mg/L	2019-09-05	
pH	**7.83**	0.10	pH units	2019-09-03	HT2
Solids, Total Suspended	**2.4**	2.0	mg/L	2019-09-04	
Temperature, at pH	**22.2**		°C	2019-09-03	HT2
Total Metals					
Aluminum, total	**0.0139**	0.0050	mg/L	2019-08-31	
Antimony, total	**0.0108**	0.00020	mg/L	2019-08-31	
Arsenic, total	**0.00157**	0.00050	mg/L	2019-08-31	
Barium, total	**0.0664**	0.0050	mg/L	2019-08-31	
Beryllium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, total	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, total	**0.0172**	0.0050	mg/L	2019-08-31	
Cadmium, total	**0.000220**	0.000010	mg/L	2019-08-31	
Calcium, total	**54.6**	0.20	mg/L	2019-08-31	
Chromium, total	**0.00054**	0.00050	mg/L	2019-08-31	
Cobalt, total	**0.00025**	0.00010	mg/L	2019-08-31	
Copper, total	**0.00057**	0.00040	mg/L	2019-08-31	
Iron, total	**0.334**	0.010	mg/L	2019-08-31	
Lead, total	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, total	**0.0115**	0.00010	mg/L	2019-08-31	
Magnesium, total	**22.5**	0.010	mg/L	2019-08-31	
Manganese, total	**0.0574**	0.00020	mg/L	2019-08-31	
Mercury, total	< 0.000010	0.000010	mg/L	2019-09-04	
Molybdenum, total	**0.00105**	0.00010	mg/L	2019-08-31	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-12 (LAURA-US) (9082964-12) | Matrix: Water | Sampled: 2019-08-28 11:33, Continued					
Total Metals, Continued					
Nickel, total	**0.00448**	0.00040	mg/L	2019-08-31	
Phosphorus, total	< 0.050	0.050	mg/L	2019-08-31	
Potassium, total	**1.45**	0.10	mg/L	2019-08-31	
Selenium, total	**0.00377**	0.00050	mg/L	2019-08-31	
Silicon, total	**4.3**	1.0	mg/L	2019-08-31	
Silver, total	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, total	**1.60**	0.10	mg/L	2019-08-31	
Strontium, total	**0.340**	0.0010	mg/L	2019-08-31	
Sulfur, total	**37.6**	3.0	mg/L	2019-08-31	
Tellurium, total	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, total	< 0.000020	0.000020	mg/L	2019-08-31	
Thorium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, total	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, total	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, total	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, total	**0.00128**	0.000020	mg/L	2019-08-31	
Vanadium, total	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, total	**0.0159**	0.0040	mg/L	2019-08-31	
Zirconium, total	< 0.00010	0.00010	mg/L	2019-08-31	

Sample Qualifiers:

HT1 The sample was prepared and/or analyzed past the recommended holding time.

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analysis Description	Method Ref.	Technique	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	Kelowna
Ammonia-N, Un-Ionized in Water	CCME WSER	CALC: Total NH3-N x 1/(1+10E((0.0902+(2730/(273.2+Temp)))-pH))	N/A
Anions in Water	SM 4110 B (2017)	Ion Chromatography	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	Kelowna
Cyanide, SAD in Water	ASTM D7511-12	Flow Injection with In-Line UV Digestion and Amperometry	Kelowna
Cyanide, WAD in Water	ASTM D6888-09	Flow Injection with Gas Diffusion and Amperometry	Kelowna
Dissolved Metals in Water	EPA 200.8 / EPA 6020B	0.45 µm Filtration / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	Richmond
Hardness in Water	SM 2340 B (2017)	Calculation: 2.497 [diss Ca] + 4.118 [diss Mg]	N/A
Mercury, dissolved in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	Richmond
Mercury, total in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	Richmond
Nitrate+Nitrite in Water	SM 4500-NO3- F (2017)	Automated Colorimetry (Cadmium Reduction)	Kelowna
Nitrite in Water	SM 4500-NO2 B (2017)	Colorimetry	Richmond
pH in Water	SM 4500-H+ B (2017)	Electrometry	Kelowna
Solids, Total Dissolved in Water	SM 1030 E (2017)	SM 1030 E (2011)	N/A
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	Kelowna
Total Metals in Water	EPA 200.2* / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	Richmond

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
°C	Degrees Celcius
mg/L	Milligrams per litre
pH units	pH < 7 = acidic, ph > 7 = basic
µS/cm	Microsiemens per centimetre
ASTM	ASTM International Test Methods
CCME	Canadian Council of Ministers of the Environment, Canada-wide Standard Reference Methods
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

General Comments:

The results in this report apply to the samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Samples will be disposed of 30 days after the test report has been issued unless otherwise agreed to in writing.

Results in **Bold** indicate values that are above CARO's method reporting limits. Any results that are above regulatory limits are highlighted **red**. Please note that results will only be highlighted red if the regulatory limits are included on the CARO report. Any Bold and/or highlighted results do not take into account method uncertainty. If you would like method uncertainty or regulatory limits to be included on your report, please contact your Account Manager:bshaw@caro.ca

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS)**: A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS)**: A second aliquot of sample is fortified with with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B9H2735										
Blank (B9H2735-BLK1)				Prepared: 2019-08-30, Analyzed: 2019-08-30						
Nitrite (as N)	< 0.0050	0.0050	mg/L							
LCS (B9H2735-BS1)				Prepared: 2019-08-30, Analyzed: 2019-08-30						
Nitrite (as N)	0.0459	0.0050	mg/L	0.0500		92	90-110			
Duplicate (B9H2735-DUP1)		**Source: 9082964-01**		Prepared: 2019-08-30, Analyzed: 2019-08-30						
Nitrite (as N)	< 0.0050	0.0050	mg/L		< 0.0050				10	
Anions, Batch B9H2757										
Blank (B9H2757-BLK1)				Prepared: 2019-08-31, Analyzed: 2019-08-31						
Chloride	< 0.10	0.10	mg/L							
Fluoride	< 0.10	0.10	mg/L							
Sulfate	< 1.0	1.0	mg/L							
Blank (B9H2757-BLK2)				Prepared: 2019-09-01, Analyzed: 2019-09-01						
Chloride	< 0.10	0.10	mg/L							
Fluoride	< 0.10	0.10	mg/L							
Sulfate	< 1.0	1.0	mg/L							
LCS (B9H2757-BS1)				Prepared: 2019-08-31, Analyzed: 2019-08-31						
Chloride	16.1	0.10	mg/L	16.0		101	90-110			
Fluoride	3.90	0.10	mg/L	4.00		98	88-108			
Sulfate	16.1	1.0	mg/L	16.0		101	90-110			
LCS (B9H2757-BS2)				Prepared: 2019-09-01, Analyzed: 2019-09-01						
Chloride	16.5	0.10	mg/L	16.0		103	90-110			
Fluoride	3.96	0.10	mg/L	4.00		99	88-108			
Sulfate	16.0	1.0	mg/L	16.0		100	90-110			
Anions, Batch B9I0036										
Blank (B9I0036-BLK1)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Nitrate+Nitrite (as N)	< 0.0050	0.0050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO Yukon Government - Water Resources
PROJECT Brewery Creek

WORK ORDER 9082964
REPORTED 2019-09-23 18:38

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B9I0036, Continued										
Blank (B9I0036-BLK2)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Nitrate+Nitrite (as N)	< 0.0050	0.0050	mg/L							
LCS (B9I0036-BS1)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Nitrate+Nitrite (as N)	0.538	0.0050	mg/L	0.500		108	91-108			
LCS (B9I0036-BS2)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Nitrate+Nitrite (as N)	0.496	0.0050	mg/L	0.500		99	91-108			
Duplicate (B9I0036-DUP1)		**Source: 9082964-01**		Prepared: 2019-09-03, Analyzed: 2019-09-03						
Nitrate+Nitrite (as N)	0.248	0.0050	mg/L		0.258			4	10	
Matrix Spike (B9I0036-MS1)		**Source: 9082964-01**		Prepared: 2019-09-03, Analyzed: 2019-09-03						
Nitrate+Nitrite (as N)	0.380	0.0050	mg/L	0.125	0.258	98	80-120			
Dissolved Metals, Batch B9H2796										
Blank (B9H2796-BLK1)				Prepared: 2019-08-31, Analyzed: 2019-08-31						
Aluminum, dissolved	< 0.0050	0.0050	mg/L							
Antimony, dissolved	< 0.00020	0.00020	mg/L							
Arsenic, dissolved	< 0.00050	0.00050	mg/L							
Barium, dissolved	< 0.0050	0.0050	mg/L							
Beryllium, dissolved	< 0.00010	0.00010	mg/L							
Bismuth, dissolved	< 0.00010	0.00010	mg/L							
Boron, dissolved	< 0.0050	0.0050	mg/L							
Cadmium, dissolved	< 0.000010	0.000010	mg/L							
Calcium, dissolved	< 0.20	0.20	mg/L							
Chromium, dissolved	< 0.00050	0.00050	mg/L							
Cobalt, dissolved	< 0.00010	0.00010	mg/L							
Copper, dissolved	< 0.00040	0.00040	mg/L							
Iron, dissolved	< 0.010	0.010	mg/L							
Lead, dissolved	< 0.00020	0.00020	mg/L							
Lithium, dissolved	< 0.00010	0.00010	mg/L							
Magnesium, dissolved	< 0.010	0.010	mg/L							
Manganese, dissolved	< 0.00020	0.00020	mg/L							
Molybdenum, dissolved	< 0.00010	0.00010	mg/L							
Nickel, dissolved	< 0.00040	0.00040	mg/L							
Phosphorus, dissolved	< 0.050	0.050	mg/L							
Potassium, dissolved	< 0.10	0.10	mg/L							
Selenium, dissolved	< 0.00050	0.00050	mg/L							
Silicon, dissolved	< 1.0	1.0	mg/L							
Silver, dissolved	< 0.000050	0.000050	mg/L							
Sodium, dissolved	< 0.10	0.10	mg/L							
Strontium, dissolved	< 0.0010	0.0010	mg/L							
Sulfur, dissolved	< 3.0	3.0	mg/L							
Tellurium, dissolved	< 0.00050	0.00050	mg/L							
Thallium, dissolved	< 0.000020	0.000020	mg/L							
Thorium, dissolved	< 0.00010	0.00010	mg/L							
Tin, dissolved	< 0.00020	0.00020	mg/L							
Titanium, dissolved	< 0.0050	0.0050	mg/L							
Tungsten, dissolved	< 0.0010	0.0010	mg/L							
Uranium, dissolved	< 0.000020	0.000020	mg/L							
Vanadium, dissolved	< 0.0010	0.0010	mg/L							
Zinc, dissolved	< 0.0040	0.0040	mg/L							
Zirconium, dissolved	< 0.00010	0.00010	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Dissolved Metals, Batch B9H2796, Continued										
Blank (B9H2796-BLK2)				Prepared: 2019-08-31, Analyzed: 2019-08-31						
Aluminum, dissolved	< 0.0050	0.0050	mg/L							
Antimony, dissolved	< 0.00020	0.00020	mg/L							
Arsenic, dissolved	< 0.00050	0.00050	mg/L							
Barium, dissolved	< 0.0050	0.0050	mg/L							
Beryllium, dissolved	< 0.00010	0.00010	mg/L							
Bismuth, dissolved	< 0.00010	0.00010	mg/L							
Boron, dissolved	< 0.0050	0.0050	mg/L							
Cadmium, dissolved	< 0.000010	0.000010	mg/L							
Calcium, dissolved	< 0.20	0.20	mg/L							
Chromium, dissolved	< 0.00050	0.00050	mg/L							
Cobalt, dissolved	< 0.00010	0.00010	mg/L							
Copper, dissolved	< 0.00040	0.00040	mg/L							
Iron, dissolved	< 0.010	0.010	mg/L							
Lead, dissolved	< 0.00020	0.00020	mg/L							
Lithium, dissolved	< 0.00010	0.00010	mg/L							
Magnesium, dissolved	< 0.010	0.010	mg/L							
Manganese, dissolved	< 0.00020	0.00020	mg/L							
Molybdenum, dissolved	< 0.00010	0.00010	mg/L							
Nickel, dissolved	< 0.00040	0.00040	mg/L							
Phosphorus, dissolved	< 0.050	0.050	mg/L							
Potassium, dissolved	< 0.10	0.10	mg/L							
Selenium, dissolved	< 0.00050	0.00050	mg/L							
Silicon, dissolved	< 1.0	1.0	mg/L							
Silver, dissolved	< 0.000050	0.000050	mg/L							
Sodium, dissolved	< 0.10	0.10	mg/L							
Strontium, dissolved	< 0.0010	0.0010	mg/L							
Sulfur, dissolved	< 3.0	3.0	mg/L							
Tellurium, dissolved	< 0.00050	0.00050	mg/L							
Thallium, dissolved	< 0.000020	0.000020	mg/L							
Thorium, dissolved	< 0.00010	0.00010	mg/L							
Tin, dissolved	< 0.00020	0.00020	mg/L							
Titanium, dissolved	< 0.0050	0.0050	mg/L							
Tungsten, dissolved	< 0.0010	0.0010	mg/L							
Uranium, dissolved	< 0.000020	0.000020	mg/L							
Vanadium, dissolved	< 0.0010	0.0010	mg/L							
Zinc, dissolved	< 0.0040	0.0040	mg/L							
Zirconium, dissolved	< 0.00010	0.00010	mg/L							
LCS (B9H2796-BS1)				Prepared: 2019-08-31, Analyzed: 2019-08-31						
Aluminum, dissolved	0.0201	0.0050	mg/L	0.0200		100	80-120			
Antimony, dissolved	0.0222	0.00020	mg/L	0.0200		111	80-120			
Arsenic, dissolved	0.0205	0.00050	mg/L	0.0200		103	80-120			
Barium, dissolved	0.0194	0.0050	mg/L	0.0200		97	80-120			
Beryllium, dissolved	0.0215	0.00010	mg/L	0.0200		108	80-120			
Bismuth, dissolved	0.0209	0.00010	mg/L	0.0200		105	80-120			
Boron, dissolved	0.0198	0.0050	mg/L	0.0200		99	80-120			
Cadmium, dissolved	0.0198	0.000010	mg/L	0.0200		99	80-120			
Calcium, dissolved	2.21	0.20	mg/L	2.02		110	80-120			
Chromium, dissolved	0.0199	0.00050	mg/L	0.0200		99	80-120			
Cobalt, dissolved	0.0199	0.00010	mg/L	0.0200		99	80-120			
Copper, dissolved	0.0219	0.00040	mg/L	0.0200		109	80-120			
Iron, dissolved	2.01	0.010	mg/L	2.02		100	80-120			
Lead, dissolved	0.0206	0.00020	mg/L	0.0200		103	80-120			
Lithium, dissolved	0.0211	0.00010	mg/L	0.0199		106	80-120			
Magnesium, dissolved	2.05	0.010	mg/L	2.02		101	80-120			
Manganese, dissolved	0.0195	0.00020	mg/L	0.0200		98	80-120			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO Yukon Government - Water Resources
PROJECT Brewery Creek

WORK ORDER 9082964
REPORTED 2019-09-23 18:38

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Dissolved Metals, Batch B9H2796, Continued										
LCS (B9H2796-BS1), Continued				Prepared: 2019-08-31, Analyzed: 2019-08-31						
Molybdenum, dissolved	0.0206	0.00010	mg/L	0.0200		103	80-120			
Nickel, dissolved	0.0198	0.00040	mg/L	0.0200		99	80-120			
Phosphorus, dissolved	2.13	0.050	mg/L	2.00		107	80-120			
Potassium, dissolved	1.98	0.10	mg/L	2.02		98	80-120			
Selenium, dissolved	0.0208	0.00050	mg/L	0.0200		104	80-120			
Silicon, dissolved	2.3	1.0	mg/L	2.00		114	80-120			
Silver, dissolved	0.0194	0.000050	mg/L	0.0200		97	80-120			
Sodium, dissolved	1.88	0.10	mg/L	2.02		93	80-120			
Strontium, dissolved	0.0197	0.0010	mg/L	0.0200		98	80-120			
Sulfur, dissolved	4.9	3.0	mg/L	5.00		98	80-120			
Tellurium, dissolved	0.0216	0.00050	mg/L	0.0200		108	80-120			
Thallium, dissolved	0.0208	0.000020	mg/L	0.0200		104	80-120			
Thorium, dissolved	0.0211	0.00010	mg/L	0.0200		106	80-120			
Tin, dissolved	0.0208	0.00020	mg/L	0.0200		104	80-120			
Titanium, dissolved	0.0215	0.0050	mg/L	0.0200		107	80-120			
Tungsten, dissolved	0.0213	0.0010	mg/L	0.0200		107	80-120			
Uranium, dissolved	0.0221	0.000020	mg/L	0.0200		111	80-120			
Vanadium, dissolved	0.0197	0.0010	mg/L	0.0200		98	80-120			
Zinc, dissolved	0.0239	0.0040	mg/L	0.0200		119	80-120			
Zirconium, dissolved	0.0240	0.00010	mg/L	0.0200		120	80-120			
Duplicate (B9H2796-DUP1)		**Source: 9082964-07**		Prepared: 2019-08-31, Analyzed: 2019-08-31						
Aluminum, dissolved	< 0.0050	0.0050	mg/L		< 0.0050				11	
Antimony, dissolved	< 0.00020	0.00020	mg/L		< 0.00020				20	
Arsenic, dissolved	< 0.00050	0.00050	mg/L		< 0.00050				8	
Barium, dissolved	< 0.0050	0.0050	mg/L		< 0.0050				7	
Beryllium, dissolved	< 0.00010	0.00010	mg/L		< 0.00010				14	
Bismuth, dissolved	< 0.00010	0.00010	mg/L		< 0.00010				20	
Boron, dissolved	0.0139	0.0050	mg/L		0.0100				13	
Cadmium, dissolved	< 0.000010	0.000010	mg/L		< 0.000010				20	
Calcium, dissolved	< 0.20	0.20	mg/L		< 0.20				8	
Chromium, dissolved	0.00052	0.00050	mg/L		< 0.00050				14	
Cobalt, dissolved	< 0.00010	0.00010	mg/L		< 0.00010				10	
Copper, dissolved	< 0.00040	0.00040	mg/L		< 0.00040				20	
Iron, dissolved	< 0.010	0.010	mg/L		< 0.010				14	
Lead, dissolved	< 0.00020	0.00020	mg/L		< 0.00020				20	
Lithium, dissolved	< 0.00010	0.00010	mg/L		< 0.00010				14	
Magnesium, dissolved	< 0.010	0.010	mg/L		< 0.010				6	
Manganese, dissolved	< 0.00020	0.00020	mg/L		< 0.00020				9	
Molybdenum, dissolved	< 0.00010	0.00010	mg/L		< 0.00010				19	
Nickel, dissolved	< 0.00040	0.00040	mg/L		< 0.00040				20	
Phosphorus, dissolved	< 0.050	0.050	mg/L		< 0.050				14	
Potassium, dissolved	< 0.10	0.10	mg/L		< 0.10				8	
Selenium, dissolved	< 0.00050	0.00050	mg/L		< 0.00050				20	
Silicon, dissolved	< 1.0	1.0	mg/L		< 1.0				12	
Silver, dissolved	< 0.000050	0.000050	mg/L		< 0.000050				20	
Sodium, dissolved	< 0.10	0.10	mg/L		< 0.10				6	
Strontium, dissolved	< 0.0010	0.0010	mg/L		< 0.0010				6	
Sulfur, dissolved	< 3.0	3.0	mg/L		< 3.0				20	
Tellurium, dissolved	< 0.00050	0.00050	mg/L		< 0.00050				20	
Thallium, dissolved	< 0.000020	0.000020	mg/L		< 0.000020				13	
Thorium, dissolved	< 0.00010	0.00010	mg/L		< 0.00010				20	
Tin, dissolved	< 0.00020	0.00020	mg/L		< 0.00020				20	
Titanium, dissolved	< 0.0050	0.0050	mg/L		< 0.0050				20	
Tungsten, dissolved	< 0.0010	0.0010	mg/L		< 0.0010				20	
Uranium, dissolved	< 0.000020	0.000020	mg/L		< 0.000020				14	

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Dissolved Metals, Batch B9H2796, Continued										
Duplicate (B9H2796-DUP1), Continued		**Source: 9082964-07**		Prepared: 2019-08-31, Analyzed: 2019-08-31						
Vanadium, dissolved	< 0.0010	0.0010	mg/L		< 0.0010				20	
Zinc, dissolved	< 0.0040	0.0040	mg/L		< 0.0040				11	
Zirconium, dissolved	< 0.00010	0.00010	mg/L		< 0.00010				20	
Reference (B9H2796-SRM1)				Prepared: 2019-08-31, Analyzed: 2019-08-31						
Aluminum, dissolved	0.226	0.0050	mg/L	0.235		96	79-114			
Antimony, dissolved	0.0467	0.00020	mg/L	0.0431		108	89-123			
Arsenic, dissolved	0.470	0.00050	mg/L	0.423		111	87-113			
Barium, dissolved	3.17	0.0050	mg/L	3.30		96	85-114			
Beryllium, dissolved	0.236	0.00010	mg/L	0.209		113	79-122			
Boron, dissolved	1.45	0.0050	mg/L	1.65		88	79-117			
Cadmium, dissolved	0.230	0.000010	mg/L	0.221		104	89-112			
Calcium, dissolved	7.50	0.20	mg/L	7.72		97	85-120			
Chromium, dissolved	0.460	0.00050	mg/L	0.434		106	87-113			
Cobalt, dissolved	0.133	0.00010	mg/L	0.124		107	90-117			
Copper, dissolved	0.880	0.00040	mg/L	0.815		108	90-115			
Iron, dissolved	1.30	0.010	mg/L	1.27		102	86-112			
Lead, dissolved	0.117	0.00020	mg/L	0.110		106	90-113			
Lithium, dissolved	0.109	0.00010	mg/L	0.100		109	77-127			
Magnesium, dissolved	6.71	0.010	mg/L	6.59		102	84-116			
Manganese, dissolved	0.340	0.00020	mg/L	0.342		99	85-113			
Molybdenum, dissolved	0.426	0.00010	mg/L	0.404		105	87-112			
Nickel, dissolved	0.891	0.00040	mg/L	0.835		107	90-114			
Phosphorus, dissolved	0.525	0.050	mg/L	0.499		105	74-119			
Potassium, dissolved	2.86	0.10	mg/L	2.88		99	78-119			
Selenium, dissolved	0.0357	0.00050	mg/L	0.0324		110	89-123			
Sodium, dissolved	17.9	0.10	mg/L	18.0		99	81-117			
Strontium, dissolved	0.957	0.0010	mg/L	0.935		102	82-111			
Thallium, dissolved	0.0419	0.000020	mg/L	0.0385		109	90-113			
Uranium, dissolved	0.262	0.000020	mg/L	0.258		102	87-113			
Vanadium, dissolved	0.895	0.0010	mg/L	0.873		103	85-110			
Zinc, dissolved	0.964	0.0040	mg/L	0.848		114	88-114			
Dissolved Metals, Batch B9I0115										
Blank (B9I0115-BLK1)				Prepared: 2019-09-03, Analyzed: 2019-09-04						
Mercury, dissolved	< 0.000010	0.000010	mg/L							
Blank (B9I0115-BLK2)				Prepared: 2019-09-03, Analyzed: 2019-09-04						
Mercury, dissolved	< 0.000010	0.000010	mg/L							
Reference (B9I0115-SRM1)				Prepared: 2019-09-03, Analyzed: 2019-09-04						
Mercury, dissolved	0.00456	0.000010	mg/L	0.00489		93	80-120			
Reference (B9I0115-SRM2)				Prepared: 2019-09-03, Analyzed: 2019-09-04						
Mercury, dissolved	0.00399	0.000010	mg/L	0.00489		81	80-120			
General Parameters, Batch B9I0033										
Blank (B9I0033-BLK1)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B9I0033, Continued										
Blank (B9I0033-BLK1), Continued				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Conductivity (EC)	< 2.0	2.0	µS/cm							
Blank (B9I0033-BLK2)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Conductivity (EC)	< 2.0	2.0	µS/cm							
Blank (B9I0033-BLK3)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Conductivity (EC)	< 2.0	2.0	µS/cm							
LCS (B9I0033-BS1)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Alkalinity, Total (as CaCO3)	99.3	1.0	mg/L	100		99	80-120			
LCS (B9I0033-BS2)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Alkalinity, Total (as CaCO3)	102	1.0	mg/L	100		102	80-120			
LCS (B9I0033-BS3)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Alkalinity, Total (as CaCO3)	101	1.0	mg/L	100		101	80-120			
LCS (B9I0033-BS4)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Conductivity (EC)	1410	2.0	µS/cm	1410		100	95-104			
LCS (B9I0033-BS5)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Conductivity (EC)	1420	2.0	µS/cm	1410		100	95-104			
LCS (B9I0033-BS6)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Conductivity (EC)	1430	2.0	µS/cm	1410		101	95-104			
Duplicate (B9I0033-DUP1)	**Source: 9082964-02**			Prepared: 2019-09-03, Analyzed: 2019-09-03						
Alkalinity, Total (as CaCO3)	208	1.0	mg/L		205			2	10	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L		< 1.0				10	
Alkalinity, Bicarbonate (as CaCO3)	208	1.0	mg/L		205			2	10	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L		< 1.0				10	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L		< 1.0				10	
Conductivity (EC)	643	2.0	µS/cm		636			1	5	
pH	7.96	0.10	pH units		7.96			< 1	4	
Reference (B9I0033-SRM1)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
pH	6.92	0.10	pH units	7.01		99	98-102			
Reference (B9I0033-SRM2)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
pH	6.94	0.10	pH units	7.01		99	98-102			
Reference (B9I0033-SRM3)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
pH	6.93	0.10	pH units	7.01		99	98-102			
General Parameters, Batch B9I0056										

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO Yukon Government - Water Resources
PROJECT Brewery Creek

WORK ORDER 9082964
REPORTED 2019-09-23 18:38

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B9I0056, Continued										
Blank (B9I0056-BLK1)				Prepared: 2019-09-04, Analyzed: 2019-09-04						
Ammonia, Total (as N)	< 0.020	0.020	mg/L							
Blank (B9I0056-BLK2)				Prepared: 2019-09-04, Analyzed: 2019-09-04						
Ammonia, Total (as N)	< 0.020	0.020	mg/L							
Blank (B9I0056-BLK3)				Prepared: 2019-09-04, Analyzed: 2019-09-04						
Ammonia, Total (as N)	< 0.020	0.020	mg/L							
LCS (B9I0056-BS1)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Ammonia, Total (as N)	1.03	0.020	mg/L	1.00		103	90-115			
LCS (B9I0056-BS2)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Ammonia, Total (as N)	0.988	0.020	mg/L	1.00		99	90-115			
LCS (B9I0056-BS3)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Ammonia, Total (as N)	1.06	0.020	mg/L	1.00		106	90-115			
General Parameters, Batch B9I0083										
Blank (B9I0083-BLK1)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Cyanide, Total	< 0.0020	0.0020	mg/L							
LCS (B9I0083-BS1)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Cyanide, Total	0.0223	0.0020	mg/L	0.0200		111	82-120			
LCS Dup (B9I0083-BSD1)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Cyanide, Total	0.0220	0.0020	mg/L	0.0200		110	82-120	1	10	
General Parameters, Batch B9I0096										
Blank (B9I0096-BLK1)				Prepared: 2019-09-04, Analyzed: 2019-09-04						
Solids, Total Suspended	< 1.0	1.0	mg/L							
Blank (B9I0096-BLK2)				Prepared: 2019-09-04, Analyzed: 2019-09-04						
Solids, Total Suspended	< 1.0	1.0	mg/L							
LCS (B9I0096-BS1)				Prepared: 2019-09-04, Analyzed: 2019-09-04						
Solids, Total Suspended	94.0	10.0	mg/L	100		94	85-115			
LCS (B9I0096-BS2)				Prepared: 2019-09-04, Analyzed: 2019-09-04						
Solids, Total Suspended	102	10.0	mg/L	100		102	85-115			
General Parameters, Batch B9I0147										
Blank (B9I0147-BLK1)				Prepared: 2019-09-04, Analyzed: 2019-09-04						
Solids, Total Suspended	< 2.0	2.0	mg/L							
Blank (B9I0147-BLK2)				Prepared: 2019-09-04, Analyzed: 2019-09-04						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B9I0147-BS1)				Prepared: 2019-09-04, Analyzed: 2019-09-04						
Solids, Total Suspended	95.0	10.0	mg/L	100		95	85-115			
LCS (B9I0147-BS2)				Prepared: 2019-09-04, Analyzed: 2019-09-04						
Solids, Total Suspended	97.0	10.0	mg/L	100		97	85-115			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B9I0227										
Blank (B9I0227-BLK1)				Prepared: 2019-09-04, Analyzed: 2019-09-04						
Cyanide, Total	< 0.0020	0.0020	mg/L							
LCS (B9I0227-BS1)				Prepared: 2019-09-04, Analyzed: 2019-09-04						
Cyanide, Total	0.0211	0.0020	mg/L	0.0200		105	82-120			
LCS Dup (B9I0227-BSD1)				Prepared: 2019-09-04, Analyzed: 2019-09-04						
Cyanide, Total	0.0206	0.0020	mg/L	0.0200		103	82-120	2	10	
General Parameters, Batch B9I0314										
Blank (B9I0314-BLK1)				Prepared: 2019-09-05, Analyzed: 2019-09-05						
Cyanide, Weak Acid Dissociable	< 0.0020	0.0020	mg/L							
LCS (B9I0314-BS1)				Prepared: 2019-09-05, Analyzed: 2019-09-05						
Cyanide, Weak Acid Dissociable	0.0208	0.0020	mg/L	0.0200		104	85-115			
LCS Dup (B9I0314-BSD1)				Prepared: 2019-09-05, Analyzed: 2019-09-05						
Cyanide, Weak Acid Dissociable	0.0212	0.0020	mg/L	0.0200		106	85-115	2	10	
Total Metals, Batch B9H2777										
Blank (B9H2777-BLK1)				Prepared: 2019-08-30, Analyzed: 2019-08-31						
Aluminum, total	< 0.0050	0.0050	mg/L							
Antimony, total	< 0.00020	0.00020	mg/L							
Arsenic, total	< 0.00050	0.00050	mg/L							
Barium, total	< 0.0050	0.0050	mg/L							
Beryllium, total	< 0.00010	0.00010	mg/L							
Bismuth, total	< 0.00010	0.00010	mg/L							
Boron, total	< 0.0050	0.0050	mg/L							
Cadmium, total	< 0.000010	0.000010	mg/L							
Calcium, total	< 0.20	0.20	mg/L							
Chromium, total	< 0.00050	0.00050	mg/L							
Cobalt, total	< 0.00010	0.00010	mg/L							
Copper, total	< 0.00040	0.00040	mg/L							
Iron, total	< 0.010	0.010	mg/L							
Lead, total	< 0.00020	0.00020	mg/L							
Lithium, total	< 0.00010	0.00010	mg/L							
Magnesium, total	< 0.010	0.010	mg/L							
Manganese, total	< 0.00020	0.00020	mg/L							
Molybdenum, total	< 0.00010	0.00010	mg/L							
Nickel, total	< 0.00040	0.00040	mg/L							
Phosphorus, total	< 0.050	0.050	mg/L							
Potassium, total	< 0.10	0.10	mg/L							
Selenium, total	< 0.00050	0.00050	mg/L							
Silicon, total	< 1.0	1.0	mg/L							
Silver, total	< 0.000050	0.000050	mg/L							
Sodium, total	< 0.10	0.10	mg/L							
Strontium, total	< 0.0010	0.0010	mg/L							
Sulfur, total	< 3.0	3.0	mg/L							
Tellurium, total	< 0.00050	0.00050	mg/L							
Thallium, total	< 0.000020	0.000020	mg/L							
Thorium, total	< 0.00010	0.00010	mg/L							
Tin, total	< 0.00020	0.00020	mg/L							
Titanium, total	< 0.0050	0.0050	mg/L							
Tungsten, total	< 0.0010	0.0010	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO Yukon Government - Water Resources
PROJECT Brewery Creek

WORK ORDER 9082964
REPORTED 2019-09-23 18:38

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B9H2777, Continued										
Blank (B9H2777-BLK1), Continued				Prepared: 2019-08-30, Analyzed: 2019-08-31						
Uranium, total	< 0.000020	0.000020	mg/L							
Vanadium, total	< 0.0010	0.0010	mg/L							
Zinc, total	< 0.0040	0.0040	mg/L							
Zirconium, total	< 0.00010	0.00010	mg/L							
Blank (B9H2777-BLK2)				Prepared: 2019-08-30, Analyzed: 2019-08-31						
Aluminum, total	< 0.0050	0.0050	mg/L							
Antimony, total	< 0.00020	0.00020	mg/L							
Arsenic, total	< 0.00050	0.00050	mg/L							
Barium, total	< 0.0050	0.0050	mg/L							
Beryllium, total	< 0.00010	0.00010	mg/L							
Bismuth, total	< 0.00010	0.00010	mg/L							
Boron, total	< 0.0050	0.0050	mg/L							
Cadmium, total	< 0.000010	0.000010	mg/L							
Calcium, total	< 0.20	0.20	mg/L							
Chromium, total	< 0.00050	0.00050	mg/L							
Cobalt, total	< 0.00010	0.00010	mg/L							
Copper, total	< 0.00040	0.00040	mg/L							
Iron, total	< 0.010	0.010	mg/L							
Lead, total	< 0.00020	0.00020	mg/L							
Lithium, total	< 0.00010	0.00010	mg/L							
Magnesium, total	< 0.010	0.010	mg/L							
Manganese, total	< 0.00020	0.00020	mg/L							
Molybdenum, total	< 0.00010	0.00010	mg/L							
Nickel, total	< 0.00040	0.00040	mg/L							
Phosphorus, total	< 0.050	0.050	mg/L							
Potassium, total	< 0.10	0.10	mg/L							
Selenium, total	< 0.00050	0.00050	mg/L							
Silicon, total	< 1.0	1.0	mg/L							
Silver, total	< 0.000050	0.000050	mg/L							
Sodium, total	< 0.10	0.10	mg/L							
Strontium, total	< 0.0010	0.0010	mg/L							
Sulfur, total	< 3.0	3.0	mg/L							
Tellurium, total	< 0.00050	0.00050	mg/L							
Thallium, total	< 0.000020	0.000020	mg/L							
Thorium, total	< 0.00010	0.00010	mg/L							
Tin, total	< 0.00020	0.00020	mg/L							
Titanium, total	< 0.0050	0.0050	mg/L							
Tungsten, total	< 0.0010	0.0010	mg/L							
Uranium, total	< 0.000020	0.000020	mg/L							
Vanadium, total	< 0.0010	0.0010	mg/L							
Zinc, total	< 0.0040	0.0040	mg/L							
Zirconium, total	< 0.00010	0.00010	mg/L							
Blank (B9H2777-BLK3)				Prepared: 2019-08-30, Analyzed: 2019-08-31						
Aluminum, total	< 0.0050	0.0050	mg/L							
Antimony, total	< 0.00020	0.00020	mg/L							
Arsenic, total	< 0.00050	0.00050	mg/L							
Barium, total	< 0.0050	0.0050	mg/L							
Beryllium, total	< 0.00010	0.00010	mg/L							
Bismuth, total	< 0.00010	0.00010	mg/L							
Boron, total	< 0.0050	0.0050	mg/L							
Cadmium, total	< 0.000010	0.000010	mg/L							
Calcium, total	< 0.20	0.20	mg/L							
Chromium, total	< 0.00050	0.00050	mg/L							
Cobalt, total	< 0.00010	0.00010	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO Yukon Government - Water Resources
PROJECT Brewery Creek

WORK ORDER 9082964
REPORTED 2019-09-23 18:38

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B9H2777, Continued										
Blank (B9H2777-BLK3), Continued				Prepared: 2019-08-30, Analyzed: 2019-08-31						
Copper, total	< 0.00040	0.00040	mg/L							
Iron, total	< 0.010	0.010	mg/L							
Lead, total	< 0.00020	0.00020	mg/L							
Lithium, total	< 0.00010	0.00010	mg/L							
Magnesium, total	< 0.010	0.010	mg/L							
Manganese, total	< 0.00020	0.00020	mg/L							
Molybdenum, total	< 0.00010	0.00010	mg/L							
Nickel, total	< 0.00040	0.00040	mg/L							
Phosphorus, total	< 0.050	0.050	mg/L							
Potassium, total	< 0.10	0.10	mg/L							
Selenium, total	< 0.00050	0.00050	mg/L							
Silicon, total	< 1.0	1.0	mg/L							
Silver, total	< 0.000050	0.000050	mg/L							
Sodium, total	< 0.10	0.10	mg/L							
Strontium, total	< 0.0010	0.0010	mg/L							
Sulfur, total	< 3.0	3.0	mg/L							
Tellurium, total	< 0.00050	0.00050	mg/L							
Thallium, total	< 0.000020	0.000020	mg/L							
Thorium, total	< 0.00010	0.00010	mg/L							
Tin, total	< 0.00020	0.00020	mg/L							
Titanium, total	< 0.0050	0.0050	mg/L							
Tungsten, total	< 0.0010	0.0010	mg/L							
Uranium, total	< 0.000020	0.000020	mg/L							
Vanadium, total	< 0.0010	0.0010	mg/L							
Zinc, total	< 0.0040	0.0040	mg/L							
Zirconium, total	< 0.00010	0.00010	mg/L							
LCS (B9H2777-BS1)				Prepared: 2019-08-30, Analyzed: 2019-08-31						
Aluminum, total	0.0233	0.0050	mg/L	0.0200		117	80-120			
Antimony, total	0.0211	0.00020	mg/L	0.0200		105	80-120			
Arsenic, total	0.0196	0.00050	mg/L	0.0200		98	80-120			
Barium, total	0.0182	0.0050	mg/L	0.0200		91	80-120			
Beryllium, total	0.0200	0.00010	mg/L	0.0200		100	80-120			
Bismuth, total	0.0201	0.00010	mg/L	0.0200		100	80-120			
Boron, total	0.0223	0.0050	mg/L	0.0200		112	80-120			
Cadmium, total	0.0191	0.000010	mg/L	0.0200		96	80-120			
Calcium, total	2.29	0.20	mg/L	2.02		113	80-120			
Chromium, total	0.0194	0.00050	mg/L	0.0200		97	80-120			
Cobalt, total	0.0198	0.00010	mg/L	0.0200		99	80-120			
Copper, total	0.0217	0.00040	mg/L	0.0200		108	80-120			
Iron, total	1.91	0.010	mg/L	2.02		95	80-120			
Lead, total	0.0197	0.00020	mg/L	0.0200		99	80-120			
Lithium, total	0.0205	0.00010	mg/L	0.0199		103	80-120			
Magnesium, total	2.14	0.010	mg/L	2.02		106	80-120			
Manganese, total	0.0201	0.00020	mg/L	0.0200		100	80-120			
Molybdenum, total	0.0197	0.00010	mg/L	0.0200		98	80-120			
Nickel, total	0.0199	0.00040	mg/L	0.0200		99	80-120			
Phosphorus, total	2.06	0.050	mg/L	2.00		103	80-120			
Potassium, total	1.96	0.10	mg/L	2.02		97	80-120			
Selenium, total	0.0210	0.00050	mg/L	0.0200		105	80-120			
Silicon, total	2.3	1.0	mg/L	2.00		114	80-120			
Silver, total	0.0190	0.000050	mg/L	0.0200		95	80-120			
Sodium, total	2.26	0.10	mg/L	2.02		112	80-120			
Strontium, total	0.0186	0.0010	mg/L	0.0200		93	80-120			
Sulfur, total	4.5	3.0	mg/L	5.00		90	80-120			
Tellurium, total	0.0206	0.00050	mg/L	0.0200		103	80-120			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B9H2777, Continued										
LCS (B9H2777-BS1), Continued				Prepared: 2019-08-30, Analyzed: 2019-08-31						
Thallium, total	0.0197	0.000020	mg/L	0.0200		99	80-120			
Thorium, total	0.0199	0.00010	mg/L	0.0200		100	80-120			
Tin, total	0.0197	0.00020	mg/L	0.0200		98	80-120			
Titanium, total	0.0209	0.0050	mg/L	0.0200		104	80-120			
Tungsten, total	0.0204	0.0010	mg/L	0.0200		102	80-120			
Uranium, total	0.0227	0.000020	mg/L	0.0200		114	80-120			
Vanadium, total	0.0199	0.0010	mg/L	0.0200		100	80-120			
Zinc, total	0.0230	0.0040	mg/L	0.0200		115	80-120			
Zirconium, total	0.0223	0.00010	mg/L	0.0200		111	80-120			
Duplicate (B9H2777-DUP1)		**Source: 9082964-03**		Prepared: 2019-08-30, Analyzed: 2019-08-31						
Aluminum, total	0.0097	0.0050	mg/L		0.0096				20	
Antimony, total	2.10	0.00020	mg/L		2.08			< 1	20	
Arsenic, total	0.310	0.00050	mg/L		0.306			1	15	
Barium, total	0.0413	0.0050	mg/L		0.0402			2	9	
Beryllium, total	< 0.00010	0.00010	mg/L		< 0.00010				16	
Bismuth, total	< 0.00010	0.00010	mg/L		< 0.00010				20	
Boron, total	0.0264	0.0050	mg/L		0.0287			8	20	
Cadmium, total	0.000379	0.000010	mg/L		0.000378			< 1	20	
Calcium, total	391	0.20	mg/L		381			3	12	
Chromium, total	0.00098	0.00050	mg/L		0.00094				12	
Cobalt, total	0.793	0.00010	mg/L		0.795			< 1	13	
Copper, total	0.00191	0.00040	mg/L		0.00193				20	
Iron, total	0.241	0.010	mg/L		0.248			3	18	
Lead, total	< 0.00020	0.00020	mg/L		< 0.00020				20	
Lithium, total	0.00643	0.00010	mg/L		0.00641			< 1	19	
Magnesium, total	100	0.010	mg/L		102			1	10	
Manganese, total	0.0257	0.00020	mg/L		0.0259			< 1	13	
Molybdenum, total	0.0174	0.00010	mg/L		0.0173			< 1	20	
Nickel, total	0.0111	0.00040	mg/L		0.0110			< 1	20	
Phosphorus, total	0.080	0.050	mg/L		0.075				20	
Potassium, total	5.97	0.10	mg/L		5.94			< 1	13	
Selenium, total	0.189	0.00050	mg/L		0.188			< 1	20	
Silicon, total	5.4	1.0	mg/L		5.4			< 1	11	
Silver, total	< 0.000050	0.000050	mg/L		< 0.000050				18	
Sodium, total	510	0.10	mg/L		514			< 1	10	
Strontium, total	1.91	0.0010	mg/L		1.91			< 1	9	
Sulfur, total	352	3.0	mg/L		355			< 1	20	
Tellurium, total	< 0.00050	0.00050	mg/L		< 0.00050				20	
Thallium, total	0.000344	0.000020	mg/L		0.000348			1	20	
Thorium, total	< 0.00010	0.00010	mg/L		< 0.00010				18	
Tin, total	< 0.00020	0.00020	mg/L		< 0.00020				20	
Titanium, total	< 0.0050	0.0050	mg/L		< 0.0050				20	
Tungsten, total	< 0.0010	0.0010	mg/L		< 0.0010				20	
Uranium, total	0.0273	0.000020	mg/L		0.0280			2	14	
Vanadium, total	< 0.0010	0.0010	mg/L		< 0.0010				17	
Zinc, total	0.0172	0.0040	mg/L		0.0170				8	
Zirconium, total	< 0.00010	0.00010	mg/L		< 0.00010				20	
Reference (B9H2777-SRM1)				Prepared: 2019-08-30, Analyzed: 2019-08-31						
Aluminum, total	0.303	0.0050	mg/L	0.303		100	82-114			
Antimony, total	0.0498	0.00020	mg/L	0.0511		97	88-115			
Arsenic, total	0.124	0.00050	mg/L	0.118		105	88-111			
Barium, total	0.759	0.0050	mg/L	0.823		92	83-110			
Beryllium, total	0.0525	0.00010	mg/L	0.0496		106	80-119			
Boron, total	2.98	0.0050	mg/L	3.45		86	80-118			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082964
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:38

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B9H2777, Continued										
Reference (B9H2777-SRM1), Continued				Prepared: 2019-08-30, Analyzed: 2019-08-31						
Cadmium, total	0.0497	0.000010	mg/L	0.0495		100	90-110			
Calcium, total	10.5	0.20	mg/L	11.6		90	85-113			
Chromium, total	0.258	0.00050	mg/L	0.250		103	88-111			
Cobalt, total	0.0409	0.00010	mg/L	0.0377		109	90-114			
Copper, total	0.529	0.00040	mg/L	0.486		109	90-117			
Iron, total	0.489	0.010	mg/L	0.488		100	90-116			
Lead, total	0.206	0.00020	mg/L	0.204		101	90-110			
Lithium, total	0.432	0.00010	mg/L	0.403		107	79-118			
Magnesium, total	4.06	0.010	mg/L	3.79		107	88-116			
Manganese, total	0.110	0.00020	mg/L	0.109		101	88-108			
Molybdenum, total	0.199	0.00010	mg/L	0.198		100	88-110			
Nickel, total	0.262	0.00040	mg/L	0.249		105	90-112			
Phosphorus, total	0.245	0.050	mg/L	0.227		108	72-118			
Potassium, total	7.26	0.10	mg/L	7.21		101	87-116			
Selenium, total	0.136	0.00050	mg/L	0.121		112	90-122			
Sodium, total	8.04	0.10	mg/L	7.54		107	86-118			
Strontium, total	0.376	0.0010	mg/L	0.375		100	86-110			
Thallium, total	0.0824	0.000020	mg/L	0.0805		102	90-113			
Uranium, total	0.0303	0.000020	mg/L	0.0306		99	88-112			
Vanadium, total	0.400	0.0010	mg/L	0.386		104	87-110			
Zinc, total	2.61	0.0040	mg/L	2.49		105	90-113			
Total Metals, Batch B9I0077										
Blank (B9I0077-BLK1)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Mercury, total	< 0.000010	0.000010	mg/L							
Blank (B9I0077-BLK2)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Mercury, total	< 0.000010	0.000010	mg/L							
Reference (B9I0077-SRM1)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Mercury, total	0.00442	0.000010	mg/L	0.00489		90	80-120			
Reference (B9I0077-SRM2)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Mercury, total	0.00413	0.000010	mg/L	0.00489		85	80-120			
Total Metals, Batch B9I0176										
Blank (B9I0176-BLK1)				Prepared: 2019-09-04, Analyzed: 2019-09-04						
Mercury, total	< 0.000010	0.000010	mg/L							
Duplicate (B9I0176-DUP1)			**Source: 9082964-11**	Prepared: 2019-09-04, Analyzed: 2019-09-04						
Mercury, total	< 0.000010	0.000010	mg/L		< 0.000010				20	
Matrix Spike (B9I0176-MS1)			**Source: 9082964-12**	Prepared: 2019-09-04, Analyzed: 2019-09-04						
Mercury, total	0.000204	0.000010	mg/L	0.000250	< 0.000010	82	70-130			
Reference (B9I0176-SRM1)				Prepared: 2019-09-04, Analyzed: 2019-09-04						
Mercury, total	0.00410	0.000010	mg/L	0.00489		84	80-120			

CARO ANALYTICAL SERVICES
Caring About Results, Obviously.

#1 17 #1

90829648

8846
V6V 2K9
V1X 5C3
T5S 1H7
V5G 4X4

CARO BC COC, Rev 2019-01

CHAIN OF CUSTODY RECORD

COC# B 80855 PAGE 1 OF

RELINQUISHED BY:	DATE: AUG 28	RECEIVED BY:	DATE: 8/29
Nicole Novodvorsky	TIME: 12:00	Air North (3E)	TIME: 14:0

TURNAROUND TIME REQUESTED:
Routine: (5-7 Days) ☑
Rush: 1 Day* ☐ 2 Day* ☐ 3 Day* ☐
Other* ____
*Contact Lab To Confirm. Surcharge May Apply

REGULATORY APPLICATION: Show on Report
Canadian Drinking Water Quality ☐ BC WQG ☐ BC HWR
BC CSR Soil: WL ☐ AL ☐ PL ☐ RL-LD ☐ RL-HD ☐ CL ☐ IL
BC CSR Water: AW ☐ IW ☐ LW ☐ DW ☐
CCME: Other:

REPORT TO:
COMPANY: GOVERNMENT OF YUKON
ADDRESS: PO BOX 2703 (V-310) WHITEHORSE, YT
CONTACT: NICOLE NOVODVORSKY
TEL/FAX: 867-667-3233
DELIVERY METHOD: EMAIL ☒ ONLINE ☐ OTHER* ☐
DATA FORMAT: EXCEL ☒ WATERTRAX ☐ ESdat ☐ EQuIS ☐ BC EMS ☐ OTHER* ☐
EMAIL 1: nicole.novodvorsky@gov.yk.ca
EMAIL 2:
EMAIL 3:

INVOICE TO: SAME AS REPORT TO ☐
COMPANY: GOVERNMENT OF YUKON
ADDRESS: PO BOX 2703 (V-310) WHITEHORSE, YT
CONTACT: JOHN RYDER
TEL/FAX:
DELIVERY METHOD: EMAIL ☐ ONLINE ☐ OTHER* ☐
EMAIL 1: john.ryder@gov.yk.ca
EMAIL 2: nicole.novodvorsky@gov.yk.ca
EMAIL 3:
PO #:

PROJECT NUMBER / INFO: BREWERY CREEK - SW + GW

A: Biohazard B: Cyanide C: PCBs D: Asbestos E: Heavy Metals F: Flammable G: Strong Odour H: High Contamination I: Other (please specify*)

** If you would like to sign up for ClientConnect and/or EnviroChain, CARO's online service offerings, please check here: ☐

SAMPLED BY: NICOLE NOVODVORSKY

	CLIENT SAMPLE ID:	MATRIX: DRINKING WATER	OTHER WATER	SOIL	OTHER	CONTAINER QTY	SAMPLING: DATE YYYY-MM-DD	TIME HH:MM	COMMENTS: CHLORINATED	FILTERED	PRESERVED	(e.g. flow/volume media ID/notes)
1	2019T26-1 (BC-01)		X			7	2019-08-27	13:20		X	X	
2	2019T26-2 (BC-32)		X			8	2019-08-27	18:09		X	X	
3	2019T26-3 (BC-28a)		X			8	2019-08-28	7:43		X	X	
4	2019T26-4 (BC-19)		X			6	2019-08-27	10:00		X	X	
5	2019T26-5 (BC-66)		X			6	2019-08-27	12:30		X	X	
6	2019T26-6 (BC-21)		X			6	2019-08-27	14:45		X	X	
7	2019T26-7 (BC-03)		X			8	2019-08-28	9:15		X	X	Field Blank
8	2019T26-8 (BC-03)		X			8	2019-08-28	9:17		X	X	
9	2019T26-9 (BC-02)		X			8	2019-08-28	10:01		X	X	
10	2019T26-10 (LAURA150)		X			8	2019-08-28	10:31		X	X	
11	2019T26-11 (LAURA-US)		X			8	2019-08-28	11:33		X	X	
12	2019T26-12 (LAURA-US)		X			8	2019-08-28	11:33		X	X	REPLICATE

ANALYSES REQUESTED:

	BTEX	VPH	PHC F1	VOC	VPH	EPH	PHC F2-F4	PAH	L/HEPH	PHENOLS Chlorinated	Non-Chlor.	PCB	GLYCOLS	HAA	THM	PESTICIDES	ACID HERBICIDES	METALS - WATER TOTAL	Hg	METALS - WATER DISSOLVED	Hg	METALS - SOIL (SALM)	inc. pH	pH	EC	ALK	ANIONS	TSS	VSS	TDS	BOD	COD	TOG	MOG	TN	NH3	TKN	FECAL COLIFORMS	HPC	TOTAL COLIFORMS	E. coli	ESSENTIAL DRINKING WATER PACKAGE	ASBESTOS	Total + Unionized Ammonia	Nitrate / Nitrite	Sulphate + Anions	Cyanide - SAD + WAD	TDS	HOLD	POSSIBLE SAMPLE HAZARD CODE(S)
1	X	X																X		X				X			X	X														X	X	X	X	X		
2	X	X																X		X				X			X	X														X	X	X	X	X		
3	X	X																X		X				X			X	X														X	X	X	X	X		
4	X	X																		X				X																		X	X	X	X	X		
5	X	X																		X				X																		X	X	X	X	X		
6	X	X																		X				X																		X	X	X	X	X		
7	X	X																X		X				X			X	X														X	X	X	X	X		
8	X	X																X		X				X			X	X														X	X	X	X	X		
9	X	X																X		X				X			X	X														X	X	X	X	X		
10	X	X																X		X				X			X	X														X	X	X	X	X		
11	X	X																X		X				X			X	X														X	X	X	X	X		
12	X	X																X		X				X			X	X														X	X	X	X	X		

SHIPPING INSTRUCTIONS: Return Cooler(s) ☐
Supplies Needed:

SAMPLE RETENTION:
30 Days (default) ☐
60 Days ☐ 90 Days ☐
Other (surcharges will apply):

*** OTHER INSTRUCTIONS:**
NOTE: 2019T26-2 labelled as LAURA DG LA, when station ID actually BC-32.

If you would like to talk to a real live Scientist about your project requirements, please check here: ☐

SAMPLE RECEIPT CONDITION:
COOLER 1 (°C): 8 ICE: Y ☑ N ☐
COOLER 2 (°C): ____ ICE: Y ☐ N ☐
COOLER 3 (°C): ____ ICE: Y ☐ N ☐
CUSTODY SEALS INTACT: NA ☐ Y ☐ N ☐

CERTIFICATE OF ANALYSIS

REPORTED TO	Yukon Government - Water Resources Suite 210, 419 Range Road Whitehorse, YT Y1A 3V1		
ATTENTION	Nicole Novodvorsky	**WORK ORDER**	9082972
PO NUMBER		**RECEIVED / TEMP**	2019-08-30 08:33 / 2°C
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:43
PROJECT INFO	YK Water Resources - C00043458	**COC NUMBER**	B80853

Introduction:

CARO Analytical Services is a testing laboratory full of smart, engaged scientists driven to make the world a safer and healthier place. Through our clients' projects we become an essential element for a better world. We employ methods conducted in accordance with recognized professional standards using accepted testing methodologies and quality control efforts. CARO is accredited by the Canadian Association for Laboratories Accreditation (CALA) to ISO 17025:2005 for specific tests listed in the scope of accreditation approved by CALA.

Big Picture Sidekicks

You know that the sample you collected after snowshoeing to site, digging 5 meters, and racing to get it on a plane so you can submit it to the lab for time sensitive results needed to make important and expensive decisions (whew) is VERY important. We know that too.

We've Got Chemistry

It's simple. We figure the more you enjoy working with our fun and engaged team members; the more likely you are to give us continued opportunities to support you.

Ahead of the Curve

Through research, regulation knowledge, and instrumentation, we are your analytical centre for the technical knowledge you need, BEFORE you need it, so you can stay up to date and in the know.

If you have any questions or concerns, please contact me at bshaw@caro.ca

Authorized By:

Bryan Shaw, Ph.D., P.Chem.
Client Service Coordinator

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082972
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:43

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-13 (Lucky-DS) (9082972-01) | Matrix: Water | Sampled: 2019-08-28 14:25					
Anions					
Chloride	**0.14**	0.10	mg/L	2019-09-01	
Fluoride	**0.34**	0.10	mg/L	2019-09-01	
Nitrate+Nitrite (as N)	**0.0821**	0.0050	mg/L	2019-09-03	
Nitrite (as N)	< 0.0050	0.0050	mg/L	2019-08-30	
Sulfate	**274**	1.0	mg/L	2019-09-03	
Calculated Parameters					
Hardness, Total (as CaCO3)	**468**	0.500	mg/L	N/A	
Ammonia, Un-Ionized (as N)	**0.001**	0.001	mg/L	2019-09-09	
Nitrate (as N)	**0.0821**	0.0100	mg/L	N/A	
Solids, Total Dissolved	**553**	10	mg/L	2019-09-09	
Dissolved Metals					
Aluminum, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	
Antimony, dissolved	**0.00282**	0.00020	mg/L	2019-08-31	
Arsenic, dissolved	**0.00290**	0.00050	mg/L	2019-08-31	
Barium, dissolved	**0.0678**	0.0050	mg/L	2019-08-31	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, dissolved	**0.0304**	0.0050	mg/L	2019-08-31	
Cadmium, dissolved	**0.000123**	0.000010	mg/L	2019-08-31	
Calcium, dissolved	**106**	0.20	mg/L	2019-08-31	
Chromium, dissolved	**0.00068**	0.00050	mg/L	2019-08-31	
Cobalt, dissolved	**0.00046**	0.00010	mg/L	2019-08-31	
Copper, dissolved	< 0.00040	0.00040	mg/L	2019-08-31	
Iron, dissolved	**0.107**	0.010	mg/L	2019-08-31	
Lead, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, dissolved	**0.0116**	0.00010	mg/L	2019-08-31	
Magnesium, dissolved	**49.2**	0.010	mg/L	2019-08-31	
Manganese, dissolved	**0.168**	0.00020	mg/L	2019-08-31	
Mercury, dissolved	< 0.000010	0.000010	mg/L	2019-09-04	
Molybdenum, dissolved	**0.00352**	0.00010	mg/L	2019-08-31	
Nickel, dissolved	**0.00376**	0.00040	mg/L	2019-08-31	
Phosphorus, dissolved	< 0.050	0.050	mg/L	2019-08-31	
Potassium, dissolved	**1.57**	0.10	mg/L	2019-08-31	
Selenium, dissolved	**0.00292**	0.00050	mg/L	2019-08-31	
Silicon, dissolved	**4.0**	1.0	mg/L	2019-08-31	
Silver, dissolved	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, dissolved	**2.41**	0.10	mg/L	2019-08-31	
Strontium, dissolved	**0.696**	0.0010	mg/L	2019-08-31	
Sulfur, dissolved	**107**	3.0	mg/L	2019-08-31	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, dissolved	< 0.000020	0.000020	mg/L	2019-08-31	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082972
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:43

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-13 (Lucky-DS) (9082972-01) | Matrix: Water | Sampled: 2019-08-28 14:25, Continued					
Dissolved Metals, Continued					
Thorium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, dissolved	**0.00477**	0.000020	mg/L	2019-08-31	
Vanadium, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, dissolved	**0.0101**	0.0040	mg/L	2019-08-31	
Zirconium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
General Parameters					
Alkalinity, Total (as CaCO3)	**195**	1.0	mg/L	2019-09-03	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Bicarbonate (as CaCO3)	**195**	1.0	mg/L	2019-09-03	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Ammonia, Total (as N)	**0.029**	0.020	mg/L	2019-09-03	
Conductivity (EC)	**829**	2.0	µS/cm	2019-09-03	
pH	**7.98**	0.10	pH units	2019-09-03	HT2
Solids, Total Suspended	< 2.0	2.0	mg/L	2019-09-04	
Temperature, at pH	**22.4**		°C	2019-09-03	HT2
Total Metals					
Aluminum, total	**0.0072**	0.0050	mg/L	2019-08-31	
Antimony, total	**0.00267**	0.00020	mg/L	2019-08-31	
Arsenic, total	**0.00367**	0.00050	mg/L	2019-08-31	
Barium, total	**0.0642**	0.0050	mg/L	2019-08-31	
Beryllium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, total	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, total	**0.0170**	0.0050	mg/L	2019-08-31	
Cadmium, total	**0.000131**	0.000010	mg/L	2019-08-31	
Calcium, total	**104**	0.20	mg/L	2019-08-31	
Chromium, total	**0.00052**	0.00050	mg/L	2019-08-31	
Cobalt, total	**0.00048**	0.00010	mg/L	2019-08-31	
Copper, total	**0.00042**	0.00040	mg/L	2019-08-31	
Iron, total	**0.216**	0.010	mg/L	2019-08-31	
Lead, total	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, total	**0.0121**	0.00010	mg/L	2019-08-31	
Magnesium, total	**49.8**	0.010	mg/L	2019-08-31	
Manganese, total	**0.167**	0.00020	mg/L	2019-08-31	
Mercury, total	< 0.000010	0.000010	mg/L	2019-09-04	
Molybdenum, total	**0.00336**	0.00010	mg/L	2019-08-31	
Nickel, total	**0.00437**	0.00040	mg/L	2019-08-31	
Phosphorus, total	< 0.050	0.050	mg/L	2019-08-31	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082972
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:43

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-13 (Lucky-DS) (9082972-01) | Matrix: Water | Sampled: 2019-08-28 14:25, Continued					
Total Metals, Continued					
Potassium, total	**1.58**	0.10	mg/L	2019-08-31	
Selenium, total	**0.00283**	0.00050	mg/L	2019-08-31	
Silicon, total	**4.1**	1.0	mg/L	2019-08-31	
Silver, total	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, total	**2.80**	0.10	mg/L	2019-08-31	
Strontium, total	**0.666**	0.0010	mg/L	2019-08-31	
Sulfur, total	**102**	3.0	mg/L	2019-08-31	
Tellurium, total	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, total	< 0.000020	0.000020	mg/L	2019-08-31	
Thorium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, total	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, total	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, total	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, total	**0.00450**	0.000020	mg/L	2019-08-31	
Vanadium, total	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, total	**0.0099**	0.0040	mg/L	2019-08-31	
Zirconium, total	< 0.00010	0.00010	mg/L	2019-08-31	
2019T26-14 (Lucky-RD) (9082972-02) | Matrix: Water | Sampled: 2019-08-28 14:45					
Anions					
Chloride	**0.16**	0.10	mg/L	2019-09-01	
Fluoride	**0.34**	0.10	mg/L	2019-09-01	
Nitrate+Nitrite (as N)	**0.0888**	0.0050	mg/L	2019-09-03	
Nitrite (as N)	< 0.0050	0.0050	mg/L	2019-08-30	
Sulfate	**224**	1.0	mg/L	2019-09-03	
Calculated Parameters					
Hardness, Total (as CaCO3)	**400**	0.500	mg/L	N/A	
Ammonia, Un-Ionized (as N)	< 0.001	0.001	mg/L	2019-09-09	
Nitrate (as N)	**0.0888**	0.0100	mg/L	N/A	
Solids, Total Dissolved	**473**	10	mg/L	2019-09-09	
Dissolved Metals					
Aluminum, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	
Antimony, dissolved	**0.00274**	0.00020	mg/L	2019-08-31	
Arsenic, dissolved	**0.00496**	0.00050	mg/L	2019-08-31	
Barium, dissolved	**0.0699**	0.0050	mg/L	2019-08-31	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, dissolved	**0.0263**	0.0050	mg/L	2019-08-31	
Cadmium, dissolved	**0.000104**	0.000010	mg/L	2019-08-31	
Calcium, dissolved	**91.0**	0.20	mg/L	2019-08-31	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082972
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:43

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-14 (Lucky-RD) (9082972-02) | Matrix: Water | Sampled: 2019-08-28 14:45, Continued					
Dissolved Metals, Continued					
Chromium, dissolved	**0.00062**	0.00050	mg/L	2019-08-31	
Cobalt, dissolved	**0.00049**	0.00010	mg/L	2019-08-31	
Copper, dissolved	< 0.00040	0.00040	mg/L	2019-08-31	
Iron, dissolved	**0.267**	0.010	mg/L	2019-08-31	
Lead, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, dissolved	**0.0112**	0.00010	mg/L	2019-08-31	
Magnesium, dissolved	**41.8**	0.010	mg/L	2019-08-31	
Manganese, dissolved	**0.124**	0.00020	mg/L	2019-08-31	
Mercury, dissolved	< 0.000010	0.000010	mg/L	2019-09-04	
Molybdenum, dissolved	**0.00565**	0.00010	mg/L	2019-08-31	
Nickel, dissolved	**0.00382**	0.00040	mg/L	2019-08-31	
Phosphorus, dissolved	< 0.050	0.050	mg/L	2019-08-31	
Potassium, dissolved	**1.48**	0.10	mg/L	2019-08-31	
Selenium, dissolved	**0.00330**	0.00050	mg/L	2019-08-31	
Silicon, dissolved	**3.9**	1.0	mg/L	2019-08-31	
Silver, dissolved	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, dissolved	**2.57**	0.10	mg/L	2019-08-31	
Strontium, dissolved	**0.628**	0.0010	mg/L	2019-08-31	
Sulfur, dissolved	**84.8**	3.0	mg/L	2019-08-31	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, dissolved	< 0.000020	0.000020	mg/L	2019-08-31	
Thorium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, dissolved	**0.00430**	0.000020	mg/L	2019-08-31	
Vanadium, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, dissolved	**0.0098**	0.0040	mg/L	2019-08-31	
Zirconium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
General Parameters					
Alkalinity, Total (as CaCO3)	**183**	1.0	mg/L	2019-09-03	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Bicarbonate (as CaCO3)	**183**	1.0	mg/L	2019-09-03	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Ammonia, Total (as N)	**0.021**	0.020	mg/L	2019-09-03	
Conductivity (EC)	**729**	2.0	µS/cm	2019-09-03	
pH	**7.95**	0.10	pH units	2019-09-03	HT2
Solids, Total Suspended	< 2.0	2.0	mg/L	2019-09-04	
Temperature, at pH	**22.4**		°C	2019-09-03	HT2
Total Metals					

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082972
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:43

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-14 (Lucky-RD) (9082972-02) | Matrix: Water | Sampled: 2019-08-28 14:45, Continued					
Total Metals, Continued					
Aluminum, total	**0.0101**	0.0050	mg/L	2019-08-31	
Antimony, total	**0.00268**	0.00020	mg/L	2019-08-31	
Arsenic, total	**0.00540**	0.00050	mg/L	2019-08-31	
Barium, total	**0.0672**	0.0050	mg/L	2019-08-31	
Beryllium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, total	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, total	**0.0164**	0.0050	mg/L	2019-08-31	
Cadmium, total	**0.000115**	0.000010	mg/L	2019-08-31	
Calcium, total	**91.4**	0.20	mg/L	2019-08-31	
Chromium, total	**0.00052**	0.00050	mg/L	2019-08-31	
Cobalt, total	**0.00051**	0.00010	mg/L	2019-08-31	
Copper, total	**0.00095**	0.00040	mg/L	2019-08-31	
Iron, total	**0.340**	0.010	mg/L	2019-08-31	
Lead, total	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, total	**0.0120**	0.00010	mg/L	2019-08-31	
Magnesium, total	**43.9**	0.010	mg/L	2019-08-31	
Manganese, total	**0.128**	0.00020	mg/L	2019-08-31	
Mercury, total	< 0.000010	0.000010	mg/L	2019-09-04	
Molybdenum, total	**0.00529**	0.00010	mg/L	2019-08-31	
Nickel, total	**0.00451**	0.00040	mg/L	2019-08-31	
Phosphorus, total	< 0.050	0.050	mg/L	2019-08-31	
Potassium, total	**1.53**	0.10	mg/L	2019-08-31	
Selenium, total	**0.00334**	0.00050	mg/L	2019-08-31	
Silicon, total	**4.1**	1.0	mg/L	2019-08-31	
Silver, total	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, total	**2.94**	0.10	mg/L	2019-08-31	
Strontium, total	**0.619**	0.0010	mg/L	2019-08-31	
Sulfur, total	**84.0**	3.0	mg/L	2019-08-31	
Tellurium, total	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, total	< 0.000020	0.000020	mg/L	2019-08-31	
Thorium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, total	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, total	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, total	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, total	**0.00414**	0.000020	mg/L	2019-08-31	
Vanadium, total	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, total	**0.0099**	0.0040	mg/L	2019-08-31	
Zirconium, total	< 0.00010	0.00010	mg/L	2019-08-31	
2019T26-15 (Lucky-TRIB) (9082972-03) | Matrix: Water | Sampled: 2019-08-28 15:05					
Anions					

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082972
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:43

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-15 (Lucky-TRIB) (9082972-03) | Matrix: Water | Sampled: 2019-08-28 15:05, Continued					
Anions, Continued					
Chloride	< 0.10	0.10	mg/L	2019-09-01	
Fluoride	**0.22**	0.10	mg/L	2019-09-01	
Nitrate+Nitrite (as N)	**0.334**	0.0050	mg/L	2019-09-03	
Nitrite (as N)	< 0.0050	0.0050	mg/L	2019-08-30	
Sulfate	**71.6**	1.0	mg/L	2019-09-01	
Calculated Parameters					
Hardness, Total (as CaCO3)	**264**	0.500	mg/L	N/A	
Ammonia, Un-Ionized (as N)	**0.003**	0.001	mg/L	2019-09-09	
Nitrate (as N)	**0.334**	0.0100	mg/L	N/A	
Solids, Total Dissolved	**271**	10	mg/L	2019-09-09	
Dissolved Metals					
Aluminum, dissolved	< 0.0050	0.0050	mg/L	2019-09-03	
Antimony, dissolved	**0.0170**	0.00020	mg/L	2019-09-03	
Arsenic, dissolved	**0.00827**	0.00050	mg/L	2019-09-03	
Barium, dissolved	**0.0672**	0.0050	mg/L	2019-09-03	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2019-09-03	
Bismuth, dissolved	< 0.00010	0.00010	mg/L	2019-09-03	
Boron, dissolved	< 0.0050	0.0050	mg/L	2019-09-03	
Cadmium, dissolved	**0.000017**	0.000010	mg/L	2019-09-03	
Calcium, dissolved	**62.5**	0.20	mg/L	2019-09-03	
Chromium, dissolved	**0.00070**	0.00050	mg/L	2019-09-03	
Cobalt, dissolved	< 0.00010	0.00010	mg/L	2019-09-03	
Copper, dissolved	< 0.00040	0.00040	mg/L	2019-09-03	
Iron, dissolved	< 0.010	0.010	mg/L	2019-09-03	
Lead, dissolved	< 0.00020	0.00020	mg/L	2019-09-03	
Lithium, dissolved	**0.00248**	0.00010	mg/L	2019-09-03	
Magnesium, dissolved	**26.2**	0.010	mg/L	2019-09-03	
Manganese, dissolved	< 0.00020	0.00020	mg/L	2019-09-03	
Mercury, dissolved	< 0.000010	0.000010	mg/L	2019-09-04	
Molybdenum, dissolved	**0.00162**	0.00010	mg/L	2019-09-03	
Nickel, dissolved	< 0.00040	0.00040	mg/L	2019-09-03	
Phosphorus, dissolved	< 0.050	0.050	mg/L	2019-09-03	
Potassium, dissolved	**0.75**	0.10	mg/L	2019-09-03	
Selenium, dissolved	**0.00195**	0.00050	mg/L	2019-09-03	
Silicon, dissolved	**2.4**	1.0	mg/L	2019-09-03	
Silver, dissolved	< 0.000050	0.000050	mg/L	2019-09-03	
Sodium, dissolved	**1.03**	0.10	mg/L	2019-09-03	
Strontium, dissolved	**0.263**	0.0010	mg/L	2019-09-03	
Sulfur, dissolved	**27.0**	3.0	mg/L	2019-09-03	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2019-09-03	
Thallium, dissolved	< 0.000020	0.000020	mg/L	2019-09-03	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082972
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:43

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-15 (Lucky-TRIB) (9082972-03) | Matrix: Water | Sampled: 2019-08-28 15:05, Continued					
Dissolved Metals, Continued					
Thorium, dissolved	< 0.00010	0.00010	mg/L	2019-09-03	
Tin, dissolved	< 0.00020	0.00020	mg/L	2019-09-03	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2019-09-03	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2019-09-03	
Uranium, dissolved	**0.000910**	0.000020	mg/L	2019-09-03	
Vanadium, dissolved	< 0.0010	0.0010	mg/L	2019-09-03	
Zinc, dissolved	< 0.0040	0.0040	mg/L	2019-09-03	
Zirconium, dissolved	< 0.00010	0.00010	mg/L	2019-09-03	
General Parameters					
Alkalinity, Total (as CaCO3)	**175**	1.0	mg/L	2019-09-03	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Bicarbonate (as CaCO3)	**175**	1.0	mg/L	2019-09-03	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Ammonia, Total (as N)	**0.056**	0.020	mg/L	2019-09-03	
Conductivity (EC)	**451**	2.0	µS/cm	2019-09-03	
pH	**8.10**	0.10	pH units	2019-09-03	HT2
Solids, Total Suspended	**4.6**	2.0	mg/L	2019-09-04	
Temperature, at pH	**22.8**		°C	2019-09-03	HT2
Total Metals					
Aluminum, total	**0.0195**	0.0050	mg/L	2019-08-31	
Antimony, total	**0.0157**	0.00020	mg/L	2019-08-31	
Arsenic, total	**0.00921**	0.00050	mg/L	2019-08-31	
Barium, total	**0.0632**	0.0050	mg/L	2019-08-31	
Beryllium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, total	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, total	**0.0116**	0.0050	mg/L	2019-08-31	
Cadmium, total	**0.000033**	0.000010	mg/L	2019-08-31	
Calcium, total	**57.3**	0.20	mg/L	2019-08-31	
Chromium, total	**0.00066**	0.00050	mg/L	2019-08-31	
Cobalt, total	< 0.00010	0.00010	mg/L	2019-08-31	
Copper, total	**0.00055**	0.00040	mg/L	2019-08-31	
Iron, total	**0.031**	0.010	mg/L	2019-08-31	
Lead, total	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, total	**0.00251**	0.00010	mg/L	2019-08-31	
Magnesium, total	**24.6**	0.010	mg/L	2019-08-31	
Manganese, total	**0.00964**	0.00020	mg/L	2019-08-31	
Mercury, total	< 0.000010	0.000010	mg/L	2019-09-04	
Molybdenum, total	**0.00097**	0.00010	mg/L	2019-08-31	
Nickel, total	**0.00045**	0.00040	mg/L	2019-08-31	
Phosphorus, total	< 0.050	0.050	mg/L	2019-08-31	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082972
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:43

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-15 (Lucky-TRIB) (9082972-03) | Matrix: Water | Sampled: 2019-08-28 15:05, Continued					
Total Metals, Continued					
Potassium, total	**0.70**	0.10	mg/L	2019-08-31	
Selenium, total	**0.00188**	0.00050	mg/L	2019-08-31	
Silicon, total	**3.4**	1.0	mg/L	2019-08-31	
Silver, total	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, total	**1.05**	0.10	mg/L	2019-08-31	
Strontium, total	**0.252**	0.0010	mg/L	2019-08-31	
Sulfur, total	**26.4**	3.0	mg/L	2019-08-31	
Tellurium, total	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, total	< 0.000020	0.000020	mg/L	2019-08-31	
Thorium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, total	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, total	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, total	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, total	**0.000878**	0.000020	mg/L	2019-08-31	
Vanadium, total	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, total	< 0.0040	0.0040	mg/L	2019-08-31	
Zirconium, total	< 0.00010	0.00010	mg/L	2019-08-31	
2019T26-16 (Lucky-US) (9082972-04) | Matrix: Water | Sampled: 2019-08-28 15:33					
Anions					
Chloride	< 0.10	0.10	mg/L	2019-09-01	
Fluoride	**0.37**	0.10	mg/L	2019-09-01	
Nitrate+Nitrite (as N)	**0.200**	0.0050	mg/L	2019-09-03	
Nitrite (as N)	< 0.0050	0.0050	mg/L	2019-08-30	
Sulfate	**41.9**	1.0	mg/L	2019-09-01	
Calculated Parameters					
Hardness, Total (as CaCO3)	**190**	0.500	mg/L	N/A	
Ammonia, Un-Ionized (as N)	**0.003**	0.001	mg/L	2019-09-09	
Nitrate (as N)	**0.200**	0.0100	mg/L	N/A	
Solids, Total Dissolved	**190**	10	mg/L	2019-09-09	
Dissolved Metals					
Aluminum, dissolved	< 0.0050	0.0050	mg/L	2019-09-03	
Antimony, dissolved	**0.00764**	0.00020	mg/L	2019-09-03	
Arsenic, dissolved	**0.00394**	0.00050	mg/L	2019-09-03	
Barium, dissolved	**0.0856**	0.0050	mg/L	2019-09-03	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2019-09-03	
Bismuth, dissolved	< 0.00010	0.00010	mg/L	2019-09-03	
Boron, dissolved	**0.0051**	0.0050	mg/L	2019-09-03	
Cadmium, dissolved	**0.000319**	0.000010	mg/L	2019-09-03	
Calcium, dissolved	**43.5**	0.20	mg/L	2019-09-03	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082972
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:43

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-16 (Lucky-US) (9082972-04) | Matrix: Water | Sampled: 2019-08-28 15:33, Continued					
Dissolved Metals, Continued					
Chromium, dissolved	**0.00080**	0.00050	mg/L	2019-09-03	
Cobalt, dissolved	< 0.00010	0.00010	mg/L	2019-09-03	
Copper, dissolved	< 0.00040	0.00040	mg/L	2019-09-03	
Iron, dissolved	< 0.010	0.010	mg/L	2019-09-03	
Lead, dissolved	< 0.00020	0.00020	mg/L	2019-09-03	
Lithium, dissolved	**0.00332**	0.00010	mg/L	2019-09-03	
Magnesium, dissolved	**19.7**	0.010	mg/L	2019-09-03	
Manganese, dissolved	< 0.00020	0.00020	mg/L	2019-09-03	
Mercury, dissolved	< 0.000010	0.000010	mg/L	2019-09-04	
Molybdenum, dissolved	**0.00525**	0.00010	mg/L	2019-09-03	
Nickel, dissolved	**0.0107**	0.00040	mg/L	2019-09-03	
Phosphorus, dissolved	< 0.050	0.050	mg/L	2019-09-03	
Potassium, dissolved	**0.85**	0.10	mg/L	2019-09-03	
Selenium, dissolved	**0.0106**	0.00050	mg/L	2019-09-03	
Silicon, dissolved	**3.7**	1.0	mg/L	2019-09-03	
Silver, dissolved	< 0.000050	0.000050	mg/L	2019-09-03	
Sodium, dissolved	**0.65**	0.10	mg/L	2019-09-03	
Strontium, dissolved	**0.166**	0.0010	mg/L	2019-09-03	
Sulfur, dissolved	**14.7**	3.0	mg/L	2019-09-03	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2019-09-03	
Thallium, dissolved	< 0.000020	0.000020	mg/L	2019-09-03	
Thorium, dissolved	< 0.00010	0.00010	mg/L	2019-09-03	
Tin, dissolved	< 0.00020	0.00020	mg/L	2019-09-03	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2019-09-03	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2019-09-03	
Uranium, dissolved	**0.00131**	0.000020	mg/L	2019-09-03	
Vanadium, dissolved	**0.0149**	0.0010	mg/L	2019-09-03	
Zinc, dissolved	**0.0304**	0.0040	mg/L	2019-09-03	
Zirconium, dissolved	< 0.00010	0.00010	mg/L	2019-09-03	
General Parameters					
Alkalinity, Total (as CaCO3)	**135**	1.0	mg/L	2019-09-03	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Bicarbonate (as CaCO3)	**135**	1.0	mg/L	2019-09-03	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Ammonia, Total (as N)	**0.049**	0.020	mg/L	2019-09-03	
Conductivity (EC)	**338**	2.0	µS/cm	2019-09-03	
pH	**8.04**	0.10	pH units	2019-09-03	HT2
Solids, Total Suspended	**2.0**	2.0	mg/L	2019-09-04	
Temperature, at pH	**23.0**		°C	2019-09-03	HT2
Total Metals					

TEST RESULTS

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PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:43

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-16 (Lucky-US) (9082972-04) | Matrix: Water | Sampled: 2019-08-28 15:33, Continued					
Total Metals, Continued					
Aluminum, total	**0.0087**	0.0050	mg/L	2019-08-31	
Antimony, total	**0.00731**	0.00020	mg/L	2019-08-31	
Arsenic, total	**0.00406**	0.00050	mg/L	2019-08-31	
Barium, total	**0.0821**	0.0050	mg/L	2019-08-31	
Beryllium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, total	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, total	**0.0109**	0.0050	mg/L	2019-08-31	
Cadmium, total	**0.000328**	0.000010	mg/L	2019-08-31	
Calcium, total	**40.5**	0.20	mg/L	2019-08-31	
Chromium, total	**0.00088**	0.00050	mg/L	2019-08-31	
Cobalt, total	< 0.00010	0.00010	mg/L	2019-08-31	
Copper, total	**0.00043**	0.00040	mg/L	2019-08-31	
Iron, total	< 0.010	0.010	mg/L	2019-08-31	
Lead, total	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, total	**0.00331**	0.00010	mg/L	2019-08-31	
Magnesium, total	**18.9**	0.010	mg/L	2019-08-31	
Manganese, total	**0.00046**	0.00020	mg/L	2019-08-31	
Mercury, total	< 0.000010	0.000010	mg/L	2019-09-04	
Molybdenum, total	**0.00526**	0.00010	mg/L	2019-08-31	
Nickel, total	**0.00680**	0.00040	mg/L	2019-08-31	
Phosphorus, total	**0.079**	0.050	mg/L	2019-08-31	
Potassium, total	**0.80**	0.10	mg/L	2019-08-31	
Selenium, total	**0.0106**	0.00050	mg/L	2019-08-31	
Silicon, total	**4.9**	1.0	mg/L	2019-08-31	
Silver, total	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, total	**0.72**	0.10	mg/L	2019-08-31	
Strontium, total	**0.166**	0.0010	mg/L	2019-08-31	
Sulfur, total	**14.4**	3.0	mg/L	2019-08-31	
Tellurium, total	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, total	< 0.000020	0.000020	mg/L	2019-08-31	
Thorium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, total	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, total	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, total	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, total	**0.00125**	0.000020	mg/L	2019-08-31	
Vanadium, total	**0.0160**	0.0010	mg/L	2019-08-31	
Zinc, total	**0.0324**	0.0040	mg/L	2019-08-31	
Zirconium, total	< 0.00010	0.00010	mg/L	2019-08-31	
2019T26-17 (GOLDENSEEP) (9082972-05) | Matrix: Water | Sampled: 2019-08-28 15:53					
Anions					

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082972
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Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-17 (GOLDENSEEP) (9082972-05) | Matrix: Water | Sampled: 2019-08-28 15:53, Continued					
Anions, Continued					
Chloride	**0.21**	0.10	mg/L	2019-09-01	
Fluoride	**0.14**	0.10	mg/L	2019-09-01	
Nitrate+Nitrite (as N)	**0.759**	0.0050	mg/L	2019-09-03	
Nitrite (as N)	< 0.0050	0.0050	mg/L	2019-08-30	
Sulfate	**54.6**	1.0	mg/L	2019-09-01	
Calculated Parameters					
Hardness, Total (as CaCO3)	**202**	0.500	mg/L	N/A	
Ammonia, Un-Ionized (as N)	**0.001**	0.001	mg/L	2019-09-09	
Nitrate (as N)	**0.759**	0.0100	mg/L	N/A	
Solids, Total Dissolved	**216**	10	mg/L	2019-09-09	
Dissolved Metals					
Aluminum, dissolved	< 0.0050	0.0050	mg/L	2019-09-03	
Antimony, dissolved	**0.310**	0.00020	mg/L	2019-09-03	
Arsenic, dissolved	**0.0610**	0.00050	mg/L	2019-09-03	
Barium, dissolved	**0.124**	0.0050	mg/L	2019-09-03	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2019-09-03	
Bismuth, dissolved	< 0.00010	0.00010	mg/L	2019-09-03	
Boron, dissolved	< 0.0050	0.0050	mg/L	2019-09-03	
Cadmium, dissolved	**0.000044**	0.000010	mg/L	2019-09-03	
Calcium, dissolved	**52.6**	0.20	mg/L	2019-09-03	
Chromium, dissolved	**0.00065**	0.00050	mg/L	2019-09-03	
Cobalt, dissolved	< 0.00010	0.00010	mg/L	2019-09-03	
Copper, dissolved	< 0.00040	0.00040	mg/L	2019-09-03	
Iron, dissolved	< 0.010	0.010	mg/L	2019-09-03	
Lead, dissolved	< 0.00020	0.00020	mg/L	2019-09-03	
Lithium, dissolved	**0.00292**	0.00010	mg/L	2019-09-03	
Magnesium, dissolved	**17.1**	0.010	mg/L	2019-09-03	
Manganese, dissolved	**0.00255**	0.00020	mg/L	2019-09-03	
Mercury, dissolved	< 0.000010	0.000010	mg/L	2019-09-04	
Molybdenum, dissolved	**0.0101**	0.00010	mg/L	2019-09-03	
Nickel, dissolved	**0.00218**	0.00040	mg/L	2019-09-03	
Phosphorus, dissolved	< 0.050	0.050	mg/L	2019-09-03	
Potassium, dissolved	**0.84**	0.10	mg/L	2019-09-03	
Selenium, dissolved	**0.00877**	0.00050	mg/L	2019-09-03	
Silicon, dissolved	**3.8**	1.0	mg/L	2019-09-03	
Silver, dissolved	< 0.000050	0.000050	mg/L	2019-09-03	
Sodium, dissolved	**1.30**	0.10	mg/L	2019-09-03	
Strontium, dissolved	**0.300**	0.0010	mg/L	2019-09-03	
Sulfur, dissolved	**19.8**	3.0	mg/L	2019-09-03	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2019-09-03	
Thallium, dissolved	**0.000067**	0.000020	mg/L	2019-09-03	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082972
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:43

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-17 (GOLDENSEEP) (9082972-05) | Matrix: Water | Sampled: 2019-08-28 15:53, Continued					
Dissolved Metals, Continued					
Thorium, dissolved	< 0.00010	0.00010	mg/L	2019-09-03	
Tin, dissolved	< 0.00020	0.00020	mg/L	2019-09-03	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2019-09-03	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2019-09-03	
Uranium, dissolved	**0.00769**	0.000020	mg/L	2019-09-03	
Vanadium, dissolved	< 0.0010	0.0010	mg/L	2019-09-03	
Zinc, dissolved	**0.0213**	0.0040	mg/L	2019-09-03	
Zirconium, dissolved	< 0.00010	0.00010	mg/L	2019-09-03	
General Parameters					
Alkalinity, Total (as CaCO3)	**140**	1.0	mg/L	2019-09-03	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Bicarbonate (as CaCO3)	**140**	1.0	mg/L	2019-09-03	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Ammonia, Total (as N)	**0.029**	0.020	mg/L	2019-09-03	
Conductivity (EC)	**357**	2.0	µS/cm	2019-09-03	
pH	**7.89**	0.10	pH units	2019-09-03	HT2
Solids, Total Suspended	< 2.0	2.0	mg/L	2019-09-04	
Temperature, at pH	**22.9**		°C	2019-09-03	HT2
2019T26-18 (GOLDENPIT) (9082972-06) | Matrix: Water | Sampled: 2019-08-28 16:28					
Anions					
Chloride	**0.15**	0.10	mg/L	2019-09-01	
Fluoride	**0.23**	0.10	mg/L	2019-09-01	
Nitrate+Nitrite (as N)	< 0.0050	0.0050	mg/L	2019-09-03	
Nitrite (as N)	< 0.0050	0.0050	mg/L	2019-08-30	
Sulfate	**181**	1.0	mg/L	2019-09-03	
Calculated Parameters					
Hardness, Total (as CaCO3)	**351**	0.500	mg/L	N/A	
Ammonia, Un-Ionized (as N)	**0.004**	0.001	mg/L	2019-09-09	
Nitrate (as N)	< 0.0100	0.0100	mg/L	N/A	
Solids, Total Dissolved	**415**	10	mg/L	2019-09-09	
Dissolved Metals					
Aluminum, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	
Antimony, dissolved	**0.0366**	0.00020	mg/L	2019-08-31	
Arsenic, dissolved	**0.0345**	0.00050	mg/L	2019-08-31	
Barium, dissolved	**0.0315**	0.0050	mg/L	2019-08-31	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082972
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Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-18 (GOLDENPIT) (9082972-06) | Matrix: Water | Sampled: 2019-08-28 16:28, Continued					
Dissolved Metals, Continued					
Boron, dissolved	**0.0164**	0.0050	mg/L	2019-08-31	
Cadmium, dissolved	< 0.000010	0.000010	mg/L	2019-08-31	
Calcium, dissolved	**79.4**	0.20	mg/L	2019-08-31	
Chromium, dissolved	**0.00050**	0.00050	mg/L	2019-08-31	
Cobalt, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Copper, dissolved	< 0.00040	0.00040	mg/L	2019-08-31	
Iron, dissolved	< 0.010	0.010	mg/L	2019-08-31	
Lead, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, dissolved	**0.00968**	0.00010	mg/L	2019-08-31	
Magnesium, dissolved	**37.0**	0.010	mg/L	2019-08-31	
Manganese, dissolved	**0.00169**	0.00020	mg/L	2019-08-31	
Mercury, dissolved	< 0.000010	0.000010	mg/L	2019-09-04	
Molybdenum, dissolved	**0.00518**	0.00010	mg/L	2019-08-31	
Nickel, dissolved	< 0.00040	0.00040	mg/L	2019-08-31	
Phosphorus, dissolved	< 0.050	0.050	mg/L	2019-08-31	
Potassium, dissolved	**1.40**	0.10	mg/L	2019-08-31	
Selenium, dissolved	**0.00203**	0.00050	mg/L	2019-08-31	
Silicon, dissolved	**3.5**	1.0	mg/L	2019-08-31	
Silver, dissolved	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, dissolved	**1.18**	0.10	mg/L	2019-08-31	
Strontium, dissolved	**0.666**	0.0010	mg/L	2019-08-31	
Sulfur, dissolved	**65.3**	3.0	mg/L	2019-08-31	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, dissolved	**0.000087**	0.000020	mg/L	2019-08-31	
Thorium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, dissolved	**0.00947**	0.000020	mg/L	2019-08-31	
Vanadium, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, dissolved	< 0.0040	0.0040	mg/L	2019-08-31	
Zirconium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
General Parameters					
Alkalinity, Total (as CaCO3)	**188**	1.0	mg/L	2019-09-03	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Bicarbonate (as CaCO3)	**188**	1.0	mg/L	2019-09-03	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Ammonia, Total (as N)	**0.059**	0.020	mg/L	2019-09-03	
Conductivity (EC)	**668**	2.0	µS/cm	2019-09-03	
pH	**8.14**	0.10	pH units	2019-09-03	HT2
Solids, Total Suspended	< 2.0	2.0	mg/L	2019-09-04	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082972
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Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-18 (GOLDENPIT) (9082972-06) | Matrix: Water | Sampled: 2019-08-28 16:28, Continued					
General Parameters, Continued					
Temperature, at pH	**22.7**		°C	2019-09-03	HT2
Total Metals					
Aluminum, total	**0.0064**	0.0050	mg/L	2019-08-31	
Antimony, total	**0.0370**	0.00020	mg/L	2019-08-31	
Arsenic, total	**0.0360**	0.00050	mg/L	2019-08-31	
Barium, total	**0.0324**	0.0050	mg/L	2019-08-31	
Beryllium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, total	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, total	**0.0102**	0.0050	mg/L	2019-08-31	
Cadmium, total	**0.000011**	0.000010	mg/L	2019-08-31	
Calcium, total	**81.9**	0.20	mg/L	2019-08-31	
Chromium, total	**0.00051**	0.00050	mg/L	2019-08-31	
Cobalt, total	< 0.00010	0.00010	mg/L	2019-08-31	
Copper, total	< 0.00040	0.00040	mg/L	2019-08-31	
Iron, total	**0.011**	0.010	mg/L	2019-08-31	
Lead, total	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, total	**0.0107**	0.00010	mg/L	2019-08-31	
Magnesium, total	**40.8**	0.010	mg/L	2019-08-31	
Manganese, total	**0.00331**	0.00020	mg/L	2019-08-31	
Mercury, total	< 0.000010	0.000010	mg/L	2019-09-04	
Molybdenum, total	**0.00546**	0.00010	mg/L	2019-08-31	
Nickel, total	< 0.00040	0.00040	mg/L	2019-08-31	
Phosphorus, total	< 0.050	0.050	mg/L	2019-08-31	
Potassium, total	**1.52**	0.10	mg/L	2019-08-31	
Selenium, total	**0.00212**	0.00050	mg/L	2019-08-31	
Silicon, total	**3.9**	1.0	mg/L	2019-08-31	
Silver, total	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, total	**1.63**	0.10	mg/L	2019-08-31	
Strontium, total	**0.684**	0.0010	mg/L	2019-08-31	
Sulfur, total	**68.0**	3.0	mg/L	2019-08-31	
Tellurium, total	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, total	**0.000070**	0.000020	mg/L	2019-08-31	
Thorium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, total	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, total	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, total	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, total	**0.00947**	0.000020	mg/L	2019-08-31	
Vanadium, total	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, total	< 0.0040	0.0040	mg/L	2019-08-31	
Zirconium, total	< 0.00010	0.00010	mg/L	2019-08-31	

CARO ANALYTICAL SERVICES

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082972
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:43

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-19 (KOKANEEPIT) (9082972-07) | Matrix: Water | Sampled: 2019-08-28 16:46					
Anions					
Chloride	**0.16**	0.10	mg/L	2019-09-01	
Fluoride	**0.16**	0.10	mg/L	2019-09-01	
Nitrate+Nitrite (as N)	< 0.0050	0.0050	mg/L	2019-09-03	
Nitrite (as N)	< 0.0050	0.0050	mg/L	2019-08-30	
Sulfate	**83.4**	1.0	mg/L	2019-09-03	
Calculated Parameters					
Hardness, Total (as CaCO3)	**218**	0.500	mg/L	N/A	
Ammonia, Un-Ionized (as N)	**0.006**	0.001	mg/L	2019-09-09	
Nitrate (as N)	< 0.0100	0.0100	mg/L	N/A	
Solids, Total Dissolved	**244**	10	mg/L	2019-09-09	
Dissolved Metals					
Aluminum, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	
Antimony, dissolved	**0.110**	0.00020	mg/L	2019-08-31	
Arsenic, dissolved	**0.0210**	0.00050	mg/L	2019-08-31	
Barium, dissolved	**0.119**	0.0050	mg/L	2019-08-31	
Beryllium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, dissolved	**0.0137**	0.0050	mg/L	2019-08-31	
Cadmium, dissolved	**0.000027**	0.000010	mg/L	2019-08-31	
Calcium, dissolved	**50.8**	0.20	mg/L	2019-08-31	
Chromium, dissolved	**0.00070**	0.00050	mg/L	2019-08-31	
Cobalt, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Copper, dissolved	< 0.00040	0.00040	mg/L	2019-08-31	
Iron, dissolved	< 0.010	0.010	mg/L	2019-08-31	
Lead, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, dissolved	**0.00333**	0.00010	mg/L	2019-08-31	
Magnesium, dissolved	**22.2**	0.010	mg/L	2019-08-31	
Manganese, dissolved	**0.00269**	0.00020	mg/L	2019-08-31	
Mercury, dissolved	< 0.000010	0.000010	mg/L	2019-09-04	
Molybdenum, dissolved	**0.00468**	0.00010	mg/L	2019-08-31	
Nickel, dissolved	< 0.00040	0.00040	mg/L	2019-08-31	
Phosphorus, dissolved	< 0.050	0.050	mg/L	2019-08-31	
Potassium, dissolved	**1.76**	0.10	mg/L	2019-08-31	
Selenium, dissolved	**0.00481**	0.00050	mg/L	2019-08-31	
Silicon, dissolved	**2.8**	1.0	mg/L	2019-08-31	
Silver, dissolved	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, dissolved	**0.48**	0.10	mg/L	2019-08-31	
Strontium, dissolved	**0.457**	0.0010	mg/L	2019-08-31	
Sulfur, dissolved	**31.7**	3.0	mg/L	2019-08-31	
Tellurium, dissolved	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, dissolved	**0.000137**	0.000020	mg/L	2019-08-31	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082972
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Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-19 (KOKANEEPIT) (9082972-07) | Matrix: Water | Sampled: 2019-08-28 16:46, Continued					
Dissolved Metals, Continued					
Thorium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, dissolved	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, dissolved	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, dissolved	**0.00803**	0.000020	mg/L	2019-08-31	
Vanadium, dissolved	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, dissolved	< 0.0040	0.0040	mg/L	2019-08-31	
Zirconium, dissolved	< 0.00010	0.00010	mg/L	2019-08-31	
General Parameters					
Alkalinity, Total (as CaCO3)	**140**	1.0	mg/L	2019-09-03	
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Bicarbonate (as CaCO3)	**140**	1.0	mg/L	2019-09-03	
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L	2019-09-03	
Ammonia, Total (as N)	**0.103**	0.020	mg/L	2019-09-03	
Conductivity (EC)	**406**	2.0	µS/cm	2019-09-03	
pH	**8.11**	0.10	pH units	2019-09-03	HT2
Solids, Total Suspended	**5.8**	2.0	mg/L	2019-09-04	
Temperature, at pH	**22.7**		°C	2019-09-03	HT2
Total Metals					
Aluminum, total	**0.0555**	0.0050	mg/L	2019-08-31	
Antimony, total	**0.104**	0.00020	mg/L	2019-08-31	
Arsenic, total	**0.0220**	0.00050	mg/L	2019-08-31	
Barium, total	**0.117**	0.0050	mg/L	2019-08-31	
Beryllium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Bismuth, total	< 0.00010	0.00010	mg/L	2019-08-31	
Boron, total	**0.0082**	0.0050	mg/L	2019-08-31	
Cadmium, total	**0.000029**	0.000010	mg/L	2019-08-31	
Calcium, total	**49.6**	0.20	mg/L	2019-08-31	
Chromium, total	**0.00060**	0.00050	mg/L	2019-08-31	
Cobalt, total	< 0.00010	0.00010	mg/L	2019-08-31	
Copper, total	**0.00075**	0.00040	mg/L	2019-08-31	
Iron, total	**0.059**	0.010	mg/L	2019-08-31	
Lead, total	< 0.00020	0.00020	mg/L	2019-08-31	
Lithium, total	**0.00350**	0.00010	mg/L	2019-08-31	
Magnesium, total	**22.8**	0.010	mg/L	2019-08-31	
Manganese, total	**0.0107**	0.00020	mg/L	2019-08-31	
Mercury, total	< 0.000010	0.000010	mg/L	2019-09-04	
Molybdenum, total	**0.00418**	0.00010	mg/L	2019-08-31	
Nickel, total	**0.00077**	0.00040	mg/L	2019-08-31	
Phosphorus, total	< 0.050	0.050	mg/L	2019-08-31	

TEST RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082972
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:43

Analyte	Result	RL	Units	Analyzed	Qualifier
2019T26-19 (KOKANEEPIT) (9082972-07) | Matrix: Water | Sampled: 2019-08-28 16:46, Continued					
Total Metals, Continued					
Potassium, total	**1.79**	0.10	mg/L	2019-08-31	
Selenium, total	**0.00480**	0.00050	mg/L	2019-08-31	
Silicon, total	**3.1**	1.0	mg/L	2019-08-31	
Silver, total	< 0.000050	0.000050	mg/L	2019-08-31	
Sodium, total	**0.83**	0.10	mg/L	2019-08-31	
Strontium, total	**0.438**	0.0010	mg/L	2019-08-31	
Sulfur, total	**31.2**	3.0	mg/L	2019-08-31	
Tellurium, total	< 0.00050	0.00050	mg/L	2019-08-31	
Thallium, total	**0.000059**	0.000020	mg/L	2019-08-31	
Thorium, total	< 0.00010	0.00010	mg/L	2019-08-31	
Tin, total	< 0.00020	0.00020	mg/L	2019-08-31	
Titanium, total	< 0.0050	0.0050	mg/L	2019-08-31	
Tungsten, total	< 0.0010	0.0010	mg/L	2019-08-31	
Uranium, total	**0.00749**	0.000020	mg/L	2019-08-31	
Vanadium, total	< 0.0010	0.0010	mg/L	2019-08-31	
Zinc, total	< 0.0040	0.0040	mg/L	2019-08-31	
Zirconium, total	< 0.00010	0.00010	mg/L	2019-08-31	

Sample Qualifiers:

HT2 The 15 minute recommended holding time (from sampling to analysis) has been exceeded - field analysis is recommended.

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082972
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Analysis Description	Method Ref.	Technique	Location
Alkalinity in Water	SM 2320 B* (2017)	Titration with H2SO4	Kelowna
Ammonia, Total in Water	SM 4500-NH3 G* (2017)	Automated Colorimetry (Phenate)	Kelowna
Ammonia-N, Un-Ionized in Water	CCME WSER	CALC: Total NH3-N x 1/(1+10E((0.0902+(2730/(273.2+Temp)))-pH))	N/A
Anions in Water	SM 4110 B (2017)	Ion Chromatography	Kelowna
Conductivity in Water	SM 2510 B (2017)	Conductivity Meter	Kelowna
Dissolved Metals in Water	EPA 200.8 / EPA 6020B	0.45 µm Filtration / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	Richmond
Hardness in Water	SM 2340 B (2017)	Calculation: 2.497 [diss Ca] + 4.118 [diss Mg]	N/A
Mercury, dissolved in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	Richmond
Mercury, total in Water	EPA 245.7*	BrCl2 Oxidation / Cold Vapor Atomic Fluorescence Spectrometry (CVAFS)	Richmond
Nitrate+Nitrite in Water	SM 4500-NO3- F (2017)	Automated Colorimetry (Cadmium Reduction)	Kelowna
Nitrite in Water	SM 4500-NO2 B (2017)	Colorimetry	Richmond
pH in Water	SM 4500-H+ B (2017)	Electrometry	Kelowna
Solids, Total Dissolved in Water	SM 1030 E (2017)	SM 1030 E (2011)	N/A
Solids, Total Suspended in Water	SM 2540 D* (2017)	Gravimetry (Dried at 103-105C)	Kelowna
Total Metals in Water	EPA 200.2* / EPA 6020B	HNO3+HCl Hot Block Digestion / Inductively Coupled Plasma-Mass Spectroscopy (ICP-MS)	Richmond

Note: An asterisk in the Method Reference indicates that the CARO method has been modified from the reference method

Glossary of Terms:

RL	Reporting Limit (default)
<	Less than the specified Reporting Limit (RL) - the actual RL may be higher than the default RL due to various factors
°C	Degrees Celcius
mg/L	Milligrams per litre
pH units	pH < 7 = acidic, ph > 7 = basic
µS/cm	Microsiemens per centimetre
CCME	Canadian Council of Ministers of the Environment, Canada-wide Standard Reference Methods
EPA	United States Environmental Protection Agency Test Methods
SM	Standard Methods for the Examination of Water and Wastewater, American Public Health Association

APPENDIX 1: SUPPORTING INFORMATION

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082972
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:43

General Comments:

The results in this report apply to the samples analyzed in accordance with the Chain of Custody document. This analytical report must be reproduced in its entirety. CARO is not responsible for any loss or damage resulting directly or indirectly from error or omission in the conduct of testing. Liability is limited to the cost of analysis. Samples will be disposed of 30 days after the test report has been issued unless otherwise agreed to in writing.

Results in **Bold** indicate values that are above CARO's method reporting limits. Any results that are above regulatory limits are highlighted **red**. Please note that results will only be highlighted red if the regulatory limits are included on the CARO report. Any Bold and/or highlighted results do not take into account method uncertainty. If you would like method uncertainty or regulatory limits to be included on your report, please contact your Account Manager:bshaw@caro.ca

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082972
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The following section displays the quality control (QC) data that is associated with your sample data. Groups of samples are prepared in "batches" and analyzed in conjunction with QC samples that ensure your data is of the highest quality. Common QC types include:

- **Method Blank (Blk)**: A blank sample that undergoes sample processing identical to that carried out for the test samples. Method blank results are used to assess contamination from the laboratory environment and reagents.
- **Duplicate (Dup)**: An additional or second portion of a randomly selected sample in the analytical run carried through the entire analytical process. Duplicates provide a measure of the analytical method's precision (reproducibility).
- **Blank Spike (BS)**: A sample of known concentration which undergoes processing identical to that carried out for test samples, also referred to as a laboratory control sample (LCS). Blank spikes provide a measure of the analytical method's accuracy.
- **Matrix Spike (MS)**: A second aliquot of sample is fortified with with a known concentration of target analytes and carried through the entire analytical process. Matrix spikes evaluate potential matrix effects that may affect the analyte recovery.
- **Reference Material (SRM)**: A homogenous material of similar matrix to the samples, certified for the parameter(s) listed. Reference Materials ensure that the analytical process is adequate to achieve acceptable recoveries of the parameter(s) tested.

Each QC type is analyzed at a 5-10% frequency, i.e. one blank/duplicate/spike for every 10-20 samples. For all types of QC, the specified recovery (% Rec) and relative percent difference (RPD) limits are derived from long-term method performance averages and/or prescribed by the reference method.

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B9H2735										
Blank (B9H2735-BLK1)				Prepared: 2019-08-30, Analyzed: 2019-08-30						
Nitrite (as N)	< 0.0050	0.0050	mg/L							
LCS (B9H2735-BS1)				Prepared: 2019-08-30, Analyzed: 2019-08-30						
Nitrite (as N)	0.0459	0.0050	mg/L	0.0500		92	90-110			
Matrix Spike (B9H2735-MS1)		**Source: 9082972-01**		Prepared: 2019-08-30, Analyzed: 2019-08-30						
Nitrite (as N)	0.0492	0.0050	mg/L	0.0500	< 0.0050	97	80-120			
Anions, Batch B9H2817										
Blank (B9H2817-BLK1)				Prepared: 2019-09-01, Analyzed: 2019-09-01						
Chloride	< 0.10	0.10	mg/L							
Fluoride	< 0.10	0.10	mg/L							
Sulfate	< 1.0	1.0	mg/L							
Blank (B9H2817-BLK2)				Prepared: 2019-09-02, Analyzed: 2019-09-02						
Chloride	< 0.10	0.10	mg/L							
Fluoride	< 0.10	0.10	mg/L							
Sulfate	< 1.0	1.0	mg/L							
LCS (B9H2817-BS1)				Prepared: 2019-09-01, Analyzed: 2019-09-01						
Chloride	16.0	0.10	mg/L	16.0		100	90-110			
Fluoride	3.99	0.10	mg/L	4.00		100	88-108			
Sulfate	16.0	1.0	mg/L	16.0		100	90-110			
LCS (B9H2817-BS2)				Prepared: 2019-09-02, Analyzed: 2019-09-02						
Chloride	16.1	0.10	mg/L	16.0		100	90-110			
Fluoride	4.02	0.10	mg/L	4.00		100	88-108			
Sulfate	15.9	1.0	mg/L	16.0		99	90-110			
Duplicate (B9H2817-DUP1)		**Source: 9082972-04**		Prepared: 2019-09-03, Analyzed: 2019-09-03						
Chloride	< 0.10	0.10	mg/L		< 0.10				10	
Fluoride	0.35	0.10	mg/L		0.37				10	
Sulfate	41.0	1.0	mg/L		41.9			2	10	

APPENDIX 2: QUALITY CONTROL RESULTS

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Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Anions, Batch B9H2817, Continued										
Matrix Spike (B9H2817-MS1)		**Source: 9082972-04**		Prepared: 2019-09-03, Analyzed: 2019-09-03						
Chloride	15.7	0.10	mg/L	16.0	< 0.10	98	75-125			
Fluoride	4.17	0.10	mg/L	4.00	0.37	95	75-125			
Sulfate	56.9	1.0	mg/L	16.0	41.9	94	75-125			
Anions, Batch B9I0036										
Blank (B9I0036-BLK1)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Nitrate+Nitrite (as N)	< 0.0050	0.0050	mg/L							
Blank (B9I0036-BLK2)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Nitrate+Nitrite (as N)	< 0.0050	0.0050	mg/L							
LCS (B9I0036-BS1)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Nitrate+Nitrite (as N)	0.538	0.0050	mg/L	0.500		108	91-108			
LCS (B9I0036-BS2)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Nitrate+Nitrite (as N)	0.496	0.0050	mg/L	0.500		99	91-108			
Duplicate (B9I0036-DUP2)		**Source: 9082972-07**		Prepared: 2019-09-03, Analyzed: 2019-09-03						
Nitrate+Nitrite (as N)	0.0050	0.0050	mg/L		< 0.0050				10	
Matrix Spike (B9I0036-MS2)		**Source: 9082972-07**		Prepared: 2019-09-03, Analyzed: 2019-09-03						
Nitrate+Nitrite (as N)	0.128	0.0050	mg/L	0.125	< 0.0050	98	80-120			
Dissolved Metals, Batch B9H2795										
Blank (B9H2795-BLK1)				Prepared: 2019-08-31, Analyzed: 2019-08-31						
Aluminum, dissolved	< 0.0050	0.0050	mg/L							
Antimony, dissolved	< 0.00020	0.00020	mg/L							
Arsenic, dissolved	< 0.00050	0.00050	mg/L							
Barium, dissolved	< 0.0050	0.0050	mg/L							
Beryllium, dissolved	< 0.00010	0.00010	mg/L							
Bismuth, dissolved	< 0.00010	0.00010	mg/L							
Boron, dissolved	< 0.0050	0.0050	mg/L							
Cadmium, dissolved	< 0.000010	0.000010	mg/L							
Calcium, dissolved	< 0.20	0.20	mg/L							
Chromium, dissolved	< 0.00050	0.00050	mg/L							
Cobalt, dissolved	< 0.00010	0.00010	mg/L							
Copper, dissolved	< 0.00040	0.00040	mg/L							
Iron, dissolved	< 0.010	0.010	mg/L							
Lead, dissolved	< 0.00020	0.00020	mg/L							
Lithium, dissolved	< 0.00010	0.00010	mg/L							
Magnesium, dissolved	< 0.010	0.010	mg/L							
Manganese, dissolved	< 0.00020	0.00020	mg/L							
Molybdenum, dissolved	< 0.00010	0.00010	mg/L							
Nickel, dissolved	< 0.00040	0.00040	mg/L							
Phosphorus, dissolved	< 0.050	0.050	mg/L							
Potassium, dissolved	< 0.10	0.10	mg/L							
Selenium, dissolved	< 0.00050	0.00050	mg/L							
Silicon, dissolved	< 1.0	1.0	mg/L							
Silver, dissolved	< 0.000050	0.000050	mg/L							
Sodium, dissolved	< 0.10	0.10	mg/L							
Strontium, dissolved	< 0.0010	0.0010	mg/L							
Sulfur, dissolved	< 3.0	3.0	mg/L							
Tellurium, dissolved	< 0.00050	0.00050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082972
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Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Dissolved Metals, Batch B9H2795, Continued										
Blank (B9H2795-BLK1), Continued				Prepared: 2019-08-31, Analyzed: 2019-08-31						
Thallium, dissolved	< 0.000020	0.000020	mg/L							
Thorium, dissolved	< 0.00010	0.00010	mg/L							
Tin, dissolved	< 0.00020	0.00020	mg/L							
Titanium, dissolved	< 0.0050	0.0050	mg/L							
Tungsten, dissolved	< 0.0010	0.0010	mg/L							
Uranium, dissolved	< 0.000020	0.000020	mg/L							
Vanadium, dissolved	< 0.0010	0.0010	mg/L							
Zinc, dissolved	< 0.0040	0.0040	mg/L							
Zirconium, dissolved	< 0.00010	0.00010	mg/L							
Blank (B9H2795-BLK2)				Prepared: 2019-08-31, Analyzed: 2019-08-31						
Copper, dissolved	< 0.00040	0.00040	mg/L							
LCS (B9H2795-BS1)				Prepared: 2019-08-31, Analyzed: 2019-08-31						
Aluminum, dissolved	0.0198	0.0050	mg/L	0.0200		99	80-120			
Antimony, dissolved	0.0215	0.00020	mg/L	0.0200		108	80-120			
Arsenic, dissolved	0.0204	0.00050	mg/L	0.0200		102	80-120			
Barium, dissolved	0.0189	0.0050	mg/L	0.0200		94	80-120			
Beryllium, dissolved	0.0214	0.00010	mg/L	0.0200		107	80-120			
Bismuth, dissolved	0.0207	0.00010	mg/L	0.0200		104	80-120			
Boron, dissolved	0.0230	0.0050	mg/L	0.0200		115	80-120			
Cadmium, dissolved	0.0198	0.000010	mg/L	0.0200		99	80-120			
Calcium, dissolved	2.22	0.20	mg/L	2.02		110	80-120			
Chromium, dissolved	0.0199	0.00050	mg/L	0.0200		100	80-120			
Cobalt, dissolved	0.0200	0.00010	mg/L	0.0200		100	80-120			
Copper, dissolved	0.0215	0.00040	mg/L	0.0200		108	80-120			
Iron, dissolved	1.99	0.010	mg/L	2.02		99	80-120			
Lead, dissolved	0.0205	0.00020	mg/L	0.0200		102	80-120			
Lithium, dissolved	0.0197	0.00010	mg/L	0.0199		99	80-120			
Magnesium, dissolved	2.02	0.010	mg/L	2.02		100	80-120			
Manganese, dissolved	0.0194	0.00020	mg/L	0.0200		97	80-120			
Molybdenum, dissolved	0.0202	0.00010	mg/L	0.0200		101	80-120			
Nickel, dissolved	0.0196	0.00040	mg/L	0.0200		98	80-120			
Phosphorus, dissolved	2.07	0.050	mg/L	2.00		103	80-120			
Potassium, dissolved	1.94	0.10	mg/L	2.02		96	80-120			
Selenium, dissolved	0.0214	0.00050	mg/L	0.0200		107	80-120			
Silicon, dissolved	2.2	1.0	mg/L	2.00		110	80-120			
Silver, dissolved	0.0193	0.000050	mg/L	0.0200		96	80-120			
Sodium, dissolved	1.88	0.10	mg/L	2.02		93	80-120			
Strontium, dissolved	0.0193	0.0010	mg/L	0.0200		96	80-120			
Sulfur, dissolved	4.4	3.0	mg/L	5.00		88	80-120			
Tellurium, dissolved	0.0213	0.00050	mg/L	0.0200		107	80-120			
Thallium, dissolved	0.0207	0.000020	mg/L	0.0200		104	80-120			
Thorium, dissolved	0.0207	0.00010	mg/L	0.0200		103	80-120			
Tin, dissolved	0.0206	0.00020	mg/L	0.0200		103	80-120			
Titanium, dissolved	0.0210	0.0050	mg/L	0.0200		105	80-120			
Tungsten, dissolved	0.0214	0.0010	mg/L	0.0200		107	80-120			
Uranium, dissolved	0.0238	0.000020	mg/L	0.0200		119	80-120			
Vanadium, dissolved	0.0195	0.0010	mg/L	0.0200		97	80-120			
Zinc, dissolved	0.0240	0.0040	mg/L	0.0200		120	80-120			
Zirconium, dissolved	0.0235	0.00010	mg/L	0.0200		118	80-120			
Duplicate (B9H2795-DUP1)		**Source: 9082972-03**		Prepared: 2019-09-03, Analyzed: 2019-09-03						
Aluminum, dissolved	< 0.0050	0.0050	mg/L		< 0.0050				11	
Antimony, dissolved	0.0161	0.00020	mg/L		0.0170			5	20	
Arsenic, dissolved	0.00803	0.00050	mg/L		0.00827			3	8	

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082972
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:43

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Dissolved Metals, Batch B9H2795, Continued										
Duplicate (B9H2795-DUP1), Continued		**Source: 9082972-03**		Prepared: 2019-09-03, Analyzed: 2019-09-03						
Barium, dissolved	0.0648	0.0050	mg/L		0.0672			4	7	
Beryllium, dissolved	< 0.00010	0.00010	mg/L		< 0.00010				14	
Bismuth, dissolved	< 0.00010	0.00010	mg/L		< 0.00010				20	
Boron, dissolved	< 0.0050	0.0050	mg/L		< 0.0050				13	
Cadmium, dissolved	0.000020	0.000010	mg/L		0.000017				20	
Calcium, dissolved	60.8	0.20	mg/L		62.5			3	8	
Chromium, dissolved	0.00067	0.00050	mg/L		0.00070				14	
Cobalt, dissolved	< 0.00010	0.00010	mg/L		< 0.00010				10	
Copper, dissolved	< 0.00040	0.00040	mg/L		< 0.00040				20	
Iron, dissolved	< 0.010	0.010	mg/L		< 0.010				14	
Lead, dissolved	< 0.00020	0.00020	mg/L		< 0.00020				20	
Lithium, dissolved	0.00233	0.00010	mg/L		0.00248			6	14	
Magnesium, dissolved	24.7	0.010	mg/L		26.2			6	6	
Manganese, dissolved	< 0.00020	0.00020	mg/L		< 0.00020				9	
Molybdenum, dissolved	0.00146	0.00010	mg/L		0.00162			10	19	
Nickel, dissolved	< 0.00040	0.00040	mg/L		< 0.00040				20	
Phosphorus, dissolved	< 0.050	0.050	mg/L		< 0.050				14	
Potassium, dissolved	0.73	0.10	mg/L		0.75			4	8	
Selenium, dissolved	0.00186	0.00050	mg/L		0.00195				20	
Silicon, dissolved	2.2	1.0	mg/L		2.4				12	
Silver, dissolved	< 0.000050	0.000050	mg/L		< 0.000050				20	
Sodium, dissolved	0.97	0.10	mg/L		1.03			6	6	
Strontium, dissolved	0.252	0.0010	mg/L		0.263			4	6	
Sulfur, dissolved	25.4	3.0	mg/L		27.0			6	20	
Tellurium, dissolved	< 0.00050	0.00050	mg/L		< 0.00050				20	
Thallium, dissolved	< 0.000020	0.000020	mg/L		< 0.000020				13	
Thorium, dissolved	< 0.00010	0.00010	mg/L		< 0.00010				20	
Tin, dissolved	< 0.00020	0.00020	mg/L		< 0.00020				20	
Titanium, dissolved	< 0.0050	0.0050	mg/L		< 0.0050				20	
Tungsten, dissolved	< 0.0010	0.0010	mg/L		< 0.0010				20	
Uranium, dissolved	0.000895	0.000020	mg/L		0.000910			2	14	
Vanadium, dissolved	< 0.0010	0.0010	mg/L		< 0.0010				20	
Zinc, dissolved	< 0.0040	0.0040	mg/L		< 0.0040				11	
Zirconium, dissolved	< 0.00010	0.00010	mg/L		< 0.00010				20	
Reference (B9H2795-SRM1)				Prepared: 2019-08-31, Analyzed: 2019-08-31						
Aluminum, dissolved	0.226	0.0050	mg/L	0.235		96	79-114			
Antimony, dissolved	0.0445	0.00020	mg/L	0.0431		103	89-123			
Arsenic, dissolved	0.455	0.00050	mg/L	0.423		108	87-113			
Barium, dissolved	3.05	0.0050	mg/L	3.30		92	85-114			
Beryllium, dissolved	0.227	0.00010	mg/L	0.209		109	79-122			
Boron, dissolved	1.53	0.0050	mg/L	1.65		93	79-117			
Cadmium, dissolved	0.223	0.000010	mg/L	0.221		101	89-112			
Calcium, dissolved	7.51	0.20	mg/L	7.72		97	85-120			
Chromium, dissolved	0.448	0.00050	mg/L	0.434		103	87-113			
Cobalt, dissolved	0.130	0.00010	mg/L	0.124		105	90-117			
Copper, dissolved	0.863	0.00040	mg/L	0.815		106	90-115			
Iron, dissolved	1.26	0.010	mg/L	1.27		99	86-112			
Lead, dissolved	0.113	0.00020	mg/L	0.110		103	90-113			
Lithium, dissolved	0.100	0.00010	mg/L	0.100		100	77-127			
Magnesium, dissolved	6.63	0.010	mg/L	6.59		101	84-116			
Manganese, dissolved	0.337	0.00020	mg/L	0.342		99	85-113			
Molybdenum, dissolved	0.410	0.00010	mg/L	0.404		101	87-112			
Nickel, dissolved	0.873	0.00040	mg/L	0.835		105	90-114			
Phosphorus, dissolved	0.513	0.050	mg/L	0.499		103	74-119			
Potassium, dissolved	2.85	0.10	mg/L	2.88		99	78-119			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082972
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:43

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Dissolved Metals, Batch B9H2795, Continued										
Reference (B9H2795-SRM1), Continued				Prepared: 2019-08-31, Analyzed: 2019-08-31						
Selenium, dissolved	0.0363	0.00050	mg/L	0.0324		112	89-123			
Sodium, dissolved	17.8	0.10	mg/L	18.0		99	81-117			
Strontium, dissolved	0.918	0.0010	mg/L	0.935		98	82-111			
Thallium, dissolved	0.0408	0.000020	mg/L	0.0385		106	90-113			
Uranium, dissolved	0.254	0.000020	mg/L	0.258		98	87-113			
Vanadium, dissolved	0.871	0.0010	mg/L	0.873		100	85-110			
Zinc, dissolved	0.942	0.0040	mg/L	0.848		111	88-114			
Dissolved Metals, Batch B9I0205										
Blank (B9I0205-BLK1)				Prepared: 2019-09-04, Analyzed: 2019-09-04						
Mercury, dissolved	< 0.000010	0.000010	mg/L							
Reference (B9I0205-SRM1)				Prepared: 2019-09-04, Analyzed: 2019-09-04						
Mercury, dissolved	0.00392	0.000010	mg/L	0.00489		80	80-120			
General Parameters, Batch B9I0033										
Blank (B9I0033-BLK1)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Conductivity (EC)	< 2.0	2.0	µS/cm							
Blank (B9I0033-BLK2)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Conductivity (EC)	< 2.0	2.0	µS/cm							
Blank (B9I0033-BLK3)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Alkalinity, Total (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Phenolphthalein (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Bicarbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Carbonate (as CaCO3)	< 1.0	1.0	mg/L							
Alkalinity, Hydroxide (as CaCO3)	< 1.0	1.0	mg/L							
Conductivity (EC)	< 2.0	2.0	µS/cm							
LCS (B9I0033-BS1)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Alkalinity, Total (as CaCO3)	99.3	1.0	mg/L	100		99	80-120			
LCS (B9I0033-BS2)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Alkalinity, Total (as CaCO3)	102	1.0	mg/L	100		102	80-120			
LCS (B9I0033-BS3)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Alkalinity, Total (as CaCO3)	101	1.0	mg/L	100		101	80-120			
LCS (B9I0033-BS4)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Conductivity (EC)	1410	2.0	µS/cm	1410		100	95-104			
LCS (B9I0033-BS5)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Conductivity (EC)	1420	2.0	µS/cm	1410		100	95-104			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082972
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:43

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
General Parameters, Batch B9I0033, Continued										
LCS (B9I0033-BS6)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Conductivity (EC)	1430	2.0	µS/cm	1410		101	95-104			
Reference (B9I0033-SRM1)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
pH	6.92	0.10	pH units	7.01		99	98-102			
Reference (B9I0033-SRM2)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
pH	6.94	0.10	pH units	7.01		99	98-102			
Reference (B9I0033-SRM3)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
pH	6.93	0.10	pH units	7.01		99	98-102			
General Parameters, Batch B9I0056										
Blank (B9I0056-BLK1)				Prepared: 2019-09-04, Analyzed: 2019-09-04						
Ammonia, Total (as N)	< 0.020	0.020	mg/L							
Blank (B9I0056-BLK2)				Prepared: 2019-09-04, Analyzed: 2019-09-04						
Ammonia, Total (as N)	< 0.020	0.020	mg/L							
Blank (B9I0056-BLK3)				Prepared: 2019-09-04, Analyzed: 2019-09-04						
Ammonia, Total (as N)	< 0.020	0.020	mg/L							
LCS (B9I0056-BS1)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Ammonia, Total (as N)	1.03	0.020	mg/L	1.00		103	90-115			
LCS (B9I0056-BS2)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Ammonia, Total (as N)	0.988	0.020	mg/L	1.00		99	90-115			
LCS (B9I0056-BS3)				Prepared: 2019-09-03, Analyzed: 2019-09-03						
Ammonia, Total (as N)	1.06	0.020	mg/L	1.00		106	90-115			
General Parameters, Batch B9I0147										
Blank (B9I0147-BLK1)				Prepared: 2019-09-04, Analyzed: 2019-09-04						
Solids, Total Suspended	< 2.0	2.0	mg/L							
Blank (B9I0147-BLK2)				Prepared: 2019-09-04, Analyzed: 2019-09-04						
Solids, Total Suspended	< 2.0	2.0	mg/L							
LCS (B9I0147-BS1)				Prepared: 2019-09-04, Analyzed: 2019-09-04						
Solids, Total Suspended	95.0	10.0	mg/L	100		95	85-115			
LCS (B9I0147-BS2)				Prepared: 2019-09-04, Analyzed: 2019-09-04						
Solids, Total Suspended	97.0	10.0	mg/L	100		97	85-115			
Total Metals, Batch B9H2777										
Blank (B9H2777-BLK1)				Prepared: 2019-08-30, Analyzed: 2019-08-31						
Aluminum, total	< 0.0050	0.0050	mg/L							
Antimony, total	< 0.00020	0.00020	mg/L							
Arsenic, total	< 0.00050	0.00050	mg/L							
Barium, total	< 0.0050	0.0050	mg/L							
Beryllium, total	< 0.00010	0.00010	mg/L							
Bismuth, total	< 0.00010	0.00010	mg/L							
Boron, total	< 0.0050	0.0050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082972
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:43

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B9H2777, Continued										
Blank (B9H2777-BLK1), Continued				Prepared: 2019-08-30, Analyzed: 2019-08-31						
Cadmium, total	< 0.000010	0.000010	mg/L							
Calcium, total	< 0.20	0.20	mg/L							
Chromium, total	< 0.00050	0.00050	mg/L							
Cobalt, total	< 0.00010	0.00010	mg/L							
Copper, total	< 0.00040	0.00040	mg/L							
Iron, total	< 0.010	0.010	mg/L							
Lead, total	< 0.00020	0.00020	mg/L							
Lithium, total	< 0.00010	0.00010	mg/L							
Magnesium, total	< 0.010	0.010	mg/L							
Manganese, total	< 0.00020	0.00020	mg/L							
Molybdenum, total	< 0.00010	0.00010	mg/L							
Nickel, total	< 0.00040	0.00040	mg/L							
Phosphorus, total	< 0.050	0.050	mg/L							
Potassium, total	< 0.10	0.10	mg/L							
Selenium, total	< 0.00050	0.00050	mg/L							
Silicon, total	< 1.0	1.0	mg/L							
Silver, total	< 0.000050	0.000050	mg/L							
Sodium, total	< 0.10	0.10	mg/L							
Strontium, total	< 0.0010	0.0010	mg/L							
Sulfur, total	< 3.0	3.0	mg/L							
Tellurium, total	< 0.00050	0.00050	mg/L							
Thallium, total	< 0.000020	0.000020	mg/L							
Thorium, total	< 0.00010	0.00010	mg/L							
Tin, total	< 0.00020	0.00020	mg/L							
Titanium, total	< 0.0050	0.0050	mg/L							
Tungsten, total	< 0.0010	0.0010	mg/L							
Uranium, total	< 0.000020	0.000020	mg/L							
Vanadium, total	< 0.0010	0.0010	mg/L							
Zinc, total	< 0.0040	0.0040	mg/L							
Zirconium, total	< 0.00010	0.00010	mg/L							
Blank (B9H2777-BLK2)				Prepared: 2019-08-30, Analyzed: 2019-08-31						
Aluminum, total	< 0.0050	0.0050	mg/L							
Antimony, total	< 0.00020	0.00020	mg/L							
Arsenic, total	< 0.00050	0.00050	mg/L							
Barium, total	< 0.0050	0.0050	mg/L							
Beryllium, total	< 0.00010	0.00010	mg/L							
Bismuth, total	< 0.00010	0.00010	mg/L							
Boron, total	< 0.0050	0.0050	mg/L							
Cadmium, total	< 0.000010	0.000010	mg/L							
Calcium, total	< 0.20	0.20	mg/L							
Chromium, total	< 0.00050	0.00050	mg/L							
Cobalt, total	< 0.00010	0.00010	mg/L							
Copper, total	< 0.00040	0.00040	mg/L							
Iron, total	< 0.010	0.010	mg/L							
Lead, total	< 0.00020	0.00020	mg/L							
Lithium, total	< 0.00010	0.00010	mg/L							
Magnesium, total	< 0.010	0.010	mg/L							
Manganese, total	< 0.00020	0.00020	mg/L							
Molybdenum, total	< 0.00010	0.00010	mg/L							
Nickel, total	< 0.00040	0.00040	mg/L							
Phosphorus, total	< 0.050	0.050	mg/L							
Potassium, total	< 0.10	0.10	mg/L							
Selenium, total	< 0.00050	0.00050	mg/L							
Silicon, total	< 1.0	1.0	mg/L							
Silver, total	< 0.000050	0.000050	mg/L							

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO Yukon Government - Water Resources
PROJECT Brewery Creek
WORK ORDER 9082972
REPORTED 2019-09-23 18:43

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B9H2777, Continued										
Blank (B9H2777-BLK2), Continued				Prepared: 2019-08-30, Analyzed: 2019-08-31						
Sodium, total	< 0.10	0.10	mg/L							
Strontium, total	< 0.0010	0.0010	mg/L							
Sulfur, total	< 3.0	3.0	mg/L							
Tellurium, total	< 0.00050	0.00050	mg/L							
Thallium, total	< 0.000020	0.000020	mg/L							
Thorium, total	< 0.00010	0.00010	mg/L							
Tin, total	< 0.00020	0.00020	mg/L							
Titanium, total	< 0.0050	0.0050	mg/L							
Tungsten, total	< 0.0010	0.0010	mg/L							
Uranium, total	< 0.000020	0.000020	mg/L							
Vanadium, total	< 0.0010	0.0010	mg/L							
Zinc, total	< 0.0040	0.0040	mg/L							
Zirconium, total	< 0.00010	0.00010	mg/L							
Blank (B9H2777-BLK3)				Prepared: 2019-08-30, Analyzed: 2019-08-31						
Aluminum, total	< 0.0050	0.0050	mg/L							
Antimony, total	< 0.00020	0.00020	mg/L							
Arsenic, total	< 0.00050	0.00050	mg/L							
Barium, total	< 0.0050	0.0050	mg/L							
Beryllium, total	< 0.00010	0.00010	mg/L							
Bismuth, total	< 0.00010	0.00010	mg/L							
Boron, total	< 0.0050	0.0050	mg/L							
Cadmium, total	< 0.000010	0.000010	mg/L							
Calcium, total	< 0.20	0.20	mg/L							
Chromium, total	< 0.00050	0.00050	mg/L							
Cobalt, total	< 0.00010	0.00010	mg/L							
Copper, total	< 0.00040	0.00040	mg/L							
Iron, total	< 0.010	0.010	mg/L							
Lead, total	< 0.00020	0.00020	mg/L							
Lithium, total	< 0.00010	0.00010	mg/L							
Magnesium, total	< 0.010	0.010	mg/L							
Manganese, total	< 0.00020	0.00020	mg/L							
Molybdenum, total	< 0.00010	0.00010	mg/L							
Nickel, total	< 0.00040	0.00040	mg/L							
Phosphorus, total	< 0.050	0.050	mg/L							
Potassium, total	< 0.10	0.10	mg/L							
Selenium, total	< 0.00050	0.00050	mg/L							
Silicon, total	< 1.0	1.0	mg/L							
Silver, total	< 0.000050	0.000050	mg/L							
Sodium, total	< 0.10	0.10	mg/L							
Strontium, total	< 0.0010	0.0010	mg/L							
Sulfur, total	< 3.0	3.0	mg/L							
Tellurium, total	< 0.00050	0.00050	mg/L							
Thallium, total	< 0.000020	0.000020	mg/L							
Thorium, total	< 0.00010	0.00010	mg/L							
Tin, total	< 0.00020	0.00020	mg/L							
Titanium, total	< 0.0050	0.0050	mg/L							
Tungsten, total	< 0.0010	0.0010	mg/L							
Uranium, total	< 0.000020	0.000020	mg/L							
Vanadium, total	< 0.0010	0.0010	mg/L							
Zinc, total	< 0.0040	0.0040	mg/L							
Zirconium, total	< 0.00010	0.00010	mg/L							
LCS (B9H2777-BS1)				Prepared: 2019-08-30, Analyzed: 2019-08-31						
Aluminum, total	0.0233	0.0050	mg/L	0.0200		117	80-120			
Antimony, total	0.0211	0.00020	mg/L	0.0200		105	80-120			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082972
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:43

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B9H2777, Continued										
LCS (B9H2777-BS1), Continued				Prepared: 2019-08-30, Analyzed: 2019-08-31						
Arsenic, total	0.0196	0.00050	mg/L	0.0200		98	80-120			
Barium, total	0.0182	0.0050	mg/L	0.0200		91	80-120			
Beryllium, total	0.0200	0.00010	mg/L	0.0200		100	80-120			
Bismuth, total	0.0201	0.00010	mg/L	0.0200		100	80-120			
Boron, total	0.0223	0.0050	mg/L	0.0200		112	80-120			
Cadmium, total	0.0191	0.000010	mg/L	0.0200		96	80-120			
Calcium, total	2.29	0.20	mg/L	2.02		113	80-120			
Chromium, total	0.0194	0.00050	mg/L	0.0200		97	80-120			
Cobalt, total	0.0198	0.00010	mg/L	0.0200		99	80-120			
Copper, total	0.0217	0.00040	mg/L	0.0200		108	80-120			
Iron, total	1.91	0.010	mg/L	2.02		95	80-120			
Lead, total	0.0197	0.00020	mg/L	0.0200		99	80-120			
Lithium, total	0.0205	0.00010	mg/L	0.0199		103	80-120			
Magnesium, total	2.14	0.010	mg/L	2.02		106	80-120			
Manganese, total	0.0201	0.00020	mg/L	0.0200		100	80-120			
Molybdenum, total	0.0197	0.00010	mg/L	0.0200		98	80-120			
Nickel, total	0.0199	0.00040	mg/L	0.0200		99	80-120			
Phosphorus, total	2.06	0.050	mg/L	2.00		103	80-120			
Potassium, total	1.96	0.10	mg/L	2.02		97	80-120			
Selenium, total	0.0210	0.00050	mg/L	0.0200		105	80-120			
Silicon, total	2.3	1.0	mg/L	2.00		114	80-120			
Silver, total	0.0190	0.000050	mg/L	0.0200		95	80-120			
Sodium, total	2.26	0.10	mg/L	2.02		112	80-120			
Strontium, total	0.0186	0.0010	mg/L	0.0200		93	80-120			
Sulfur, total	4.5	3.0	mg/L	5.00		90	80-120			
Tellurium, total	0.0206	0.00050	mg/L	0.0200		103	80-120			
Thallium, total	0.0197	0.000020	mg/L	0.0200		99	80-120			
Thorium, total	0.0199	0.00010	mg/L	0.0200		100	80-120			
Tin, total	0.0197	0.00020	mg/L	0.0200		98	80-120			
Titanium, total	0.0209	0.0050	mg/L	0.0200		104	80-120			
Tungsten, total	0.0204	0.0010	mg/L	0.0200		102	80-120			
Uranium, total	0.0227	0.000020	mg/L	0.0200		114	80-120			
Vanadium, total	0.0199	0.0010	mg/L	0.0200		100	80-120			
Zinc, total	0.0230	0.0040	mg/L	0.0200		115	80-120			
Zirconium, total	0.0223	0.00010	mg/L	0.0200		111	80-120			
Reference (B9H2777-SRM1)				Prepared: 2019-08-30, Analyzed: 2019-08-31						
Aluminum, total	0.303	0.0050	mg/L	0.303		100	82-114			
Antimony, total	0.0498	0.00020	mg/L	0.0511		97	88-115			
Arsenic, total	0.124	0.00050	mg/L	0.118		105	88-111			
Barium, total	0.759	0.0050	mg/L	0.823		92	83-110			
Beryllium, total	0.0525	0.00010	mg/L	0.0496		106	80-119			
Boron, total	2.98	0.0050	mg/L	3.45		86	80-118			
Cadmium, total	0.0497	0.000010	mg/L	0.0495		100	90-110			
Calcium, total	10.5	0.20	mg/L	11.6		90	85-113			
Chromium, total	0.258	0.00050	mg/L	0.250		103	88-111			
Cobalt, total	0.0409	0.00010	mg/L	0.0377		109	90-114			
Copper, total	0.529	0.00040	mg/L	0.486		109	90-117			
Iron, total	0.489	0.010	mg/L	0.488		100	90-116			
Lead, total	0.206	0.00020	mg/L	0.204		101	90-110			
Lithium, total	0.432	0.00010	mg/L	0.403		107	79-118			
Magnesium, total	4.06	0.010	mg/L	3.79		107	88-116			
Manganese, total	0.110	0.00020	mg/L	0.109		101	88-108			
Molybdenum, total	0.199	0.00010	mg/L	0.198		100	88-110			
Nickel, total	0.262	0.00040	mg/L	0.249		105	90-112			
Phosphorus, total	0.245	0.050	mg/L	0.227		108	72-118			

APPENDIX 2: QUALITY CONTROL RESULTS

REPORTED TO	Yukon Government - Water Resources	**WORK ORDER**	9082972
PROJECT	Brewery Creek	**REPORTED**	2019-09-23 18:43

Analyte	Result	RL	Units	Spike Level	Source Result	% REC	REC Limit	% RPD	RPD Limit	Qualifier
Total Metals, Batch B9H2777, Continued										
Reference (B9H2777-SRM1), Continued				Prepared: 2019-08-30, Analyzed: 2019-08-31						
Potassium, total	7.26	0.10	mg/L	7.21		101	87-116			
Selenium, total	0.136	0.00050	mg/L	0.121		112	90-122			
Sodium, total	8.04	0.10	mg/L	7.54		107	86-118			
Strontium, total	0.376	0.0010	mg/L	0.375		100	86-110			
Thallium, total	0.0824	0.000020	mg/L	0.0805		102	90-113			
Uranium, total	0.0303	0.000020	mg/L	0.0306		99	88-112			
Vanadium, total	0.400	0.0010	mg/L	0.386		104	87-110			
Zinc, total	2.61	0.0040	mg/L	2.49		105	90-113			
Total Metals, Batch B9I0176										
Blank (B9I0176-BLK1)				Prepared: 2019-09-04, Analyzed: 2019-09-04						
Mercury, total	< 0.000010	0.000010	mg/L							
Reference (B9I0176-SRM1)				Prepared: 2019-09-04, Analyzed: 2019-09-04						
Mercury, total	0.00410	0.000010	mg/L	0.00489		84	80-120			

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...rnaby, BC V5G 4X4

CARO BC COC, Rev 2019-01

CHAIN OF CUSTODY RECORD

COC# B 80853 PAGE 1 OF

RELINQUISHED BY:	DATE:	RECEIVED BY:	DATE:
Nicole Novodvorsky	Aug 29/19	[illegible]	08/30
	TIME: 14:00		TIME: 08:3

TURNAROUND TIME REQUESTED:
Routine: (5-7 Days) ☑
Rush: 1 Day* ☐ 2 Day* ☐ 3 Day* ☐
Other* ____
*Contact Lab To Confirm. Surcharge May Apply

REGULATORY APPLICATION: Show on Report
Canadian Drinking Water Quality ☐ BC WQG ☐ BC HWR ☐
BC CSR Soil: WL ☐ AL ☐ PL ☐ RL-LD ☐ RL-HD ☐ CL ☐ IL ☐
BC CSR Water: AW ☐ IW ☐ LW ☐ DW ☐
CCME: ____ Other: ____

PROJECT NUMBER / INFO: Brewery Creek

A: Biohazard B: Cyanide C: PCBs D: Asbestos E: Heavy Metals F: Flammable G: Strong Odour H: High Contamination I: Other (please specify*)

REPORT TO:

COMPANY: Government of Yukon
ADDRESS: PO Box 2703
WHITEHORSE, YT
CONTACT: NICOLE NOVODVORSKY
TEL/FAX: 867-689-1426
DELIVERY METHOD: EMAIL ☒ ONLINE ☐ OTHER* ☐
DATA FORMAT: EXCEL ☒ WATERTRAX ☐ ESdat ☐ EQuIS ☐ BC EMS ☐ OTHER* ☐
EMAIL 1: nicole.novodvorsky@gov.yk.ca
EMAIL 2:
EMAIL 3:

COPY OF REPORT TO: ☐ SAME AS REPORT TO ☐

COMPANY: Government of Yukon
ADDRESS: PO Box 2703
WHITEHORSE, YT
CONTACT: JOHN RYDER
TEL/FAX:
DELIVERY METHOD: EMAIL ☒ ONLINE ☐ OTHER* ☐
EMAIL 1: john.ryder@gov.yk.ca
EMAIL 2: nicole.novodvorsky@gov.yk.ca
EMAIL 3:
PO #:

** If you would like to sign up for ClientConnect and/or EnviroChain, CARO's online service offerings, please check here: ☐

SAMPLED BY:

	CLIENT SAMPLE ID:	MATRIX: DRINKING WATER	OTHER WATER	SOIL	OTHER	CONTAINER QTY	SAMPLING: DATE YYYY-MM-DD	TIME HH:MM	COMMENTS: CHLORINATED	FILTERED	PRESERVED	(e.g. flow/volume media ID/notes)
1	2019T26-13 (LUCKY-DS)		X			8	20190828	14:25		X	X	
2	2019T26-14 (LUCKY-RD)		X			8	20190828	14:45		X	X	
3	2019T26-15 (LUCKY-TRIB)		X			8	20190828	15:05		X	X	
4	2019T26-16 (LUCKY-US)		X			8	20190828	15:33		X	X	
5	2019T26-17 (GOLDENSTEP)		X			8	20190828	15:53		X	X	
6	2019T26-18 (GOLDEN PIT)		X			8	20190828	16:28		X	X	
7	2019T26-19 (KOKANEE PIT)		X			8	20190828	16:46		X	X	

ANALYSES REQUESTED:

	BTEX ☐	VPH ☐	PHC F1 ☐	VOC ☐	VPH ☐	EPH ☐	PHC F2-F4 ☐	PAH ☐	L/HEPH ☐	PHENOLS Chlorinated ☐	Non-Chlor. ☐	PCB ☐	GLYCOLS ☐	HAA ☐	THM ☐	PESTICIDES ☐	ACID HERBICIDES ☐	METALS - WATER TOTAL	Hg ☑	METALS - WATER DISSOLVED	Hg ☑	METALS - SOIL (SALM) ☐	inc. pH ☐	pH ☑	EC ☑	ALK ☑	ANIONS ☑	TSS ☑	VSS ☐	TDS ☑	BOD ☐	COD ☐	TOG ☐	MOG ☐	TN ☐	TKN ☐	NH3 ☐	FECAL COLIFORMS ☐	HPC ☐	TOTAL COLIFORMS ☐	E. coli ☐	ESSENTIAL DRINKING WATER PACKAGE	ASBESTOS	Nitrate, Nitrite	Total + unionized Ammonia	Sulphate				HOLD	POSSIBLE SAMPLE HAZARD CODE(S)
1																		X		X				X			X	X															X	X	X					
2																		X		X				X			X	X															X	X	X					
3																		X		X				X			X	X															X	X	X					
4																		X		X				X			X	X															X	X	X					
5																				X				X			X	X															X	X	X					
6																		X		X				X			X	X															X	X	X					
7																		X		X				X			X	X															X	X	X					

SHIPPING INSTRUCTIONS: Return Cooler(s) ☐
Supplies Needed:

SAMPLE RETENTION:
30 Days (default) ☐
60 Days ☐ 90 Days ☐
Other (surcharges will apply): ____

*** OTHER INSTRUCTIONS:**

If you would like to talk to a real live Scientist about your project requirements, please check here: ☐

SAMPLE RECEIPT CONDITION:
COOLER 1 (°C): 1.6 ICE: Y ☑ N ☐
COOLER 2 (°C): ____ ICE: Y ☐ N ☐
COOLER 3 (°C): ____ ICE: Y ☐ N ☐
CUSTODY SEALS INTACT: NA ☐ Y ☐ N ☐