Water Resources Audit Report

Mt. Nansen/*Enozhí Ddhäw*, Yukon

Water Resources Branch
July 12 – 14, 2021

This page is intentionally blank.

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

One of WRB's responsibilities is to conduct audits of various undertakings that use or deposit waste to water. Audits are undertaken to improve our knowledge and understanding of a project's effects on the receiving water environment, with the intention of identifying emerging issues and sharing enhanced understanding of existing water quality and quantity conditions to support technical advice and input into assessment, licensing, and post-licensing processes. The opinions and recommendations expressed in this report are based on relevant data, reports, field observations, and interpretation/analyses of scientific information available to WRB. However, we strive to recognize diverse ways of knowing and being and to create space to learn from both Indigenous and scientific perspectives side-by-side. Such opinions and recommendations are subject to evolve as further information becomes available.

While WRB provides support to inspectors on enforcement and compliance matters related to water licences, it is not WRB's role to determine or enforce compliance. As such, the findings of this report should not be considered as a determination of compliance with any existing permit or licence.

Executive Summary

WRB conducted an audit at the Mount Nansen/*Enozhí Ddhäw* property which is located approximately 45 km west of the Village of Carmacks from July 12 to July 14, 2021. Information and conclusions contained in this audit report are intended to support WRB in the review process of the Mount Nansen Adaptive Management Plan (AMP) and future water licensing renewal applications during closure and remediation of the site.

The primary objectives of this audit were to:

1) Investigate potential sampling locations upstream of placer influence on Victoria Creek, Back Creek and Pony Creek, and identify a viable location for long-term monitoring on Minnesota Creek;
2) Assess and investigate surface water in the upper reaches of Dome Creek, as well as the mill area in light of recent spikes in Zinc concentrations in that area; and
3) Complete a desktop investigation focusing on groundwater, the Brown-McDade pit, and the seep pond.

Surface water samples were collected at the Mount Nansen site at existing monthly monitoring stations as well as newly identified locations to allow for both temporal analysis as well as analysis of new or emergent groundwater seeps in the mill area. Field crews investigated upstream reaches of placer-impacted creeks on foot as well as with the use of a small aerial drone to locate potential un-impacted sampling locations.

Samples were analyzed for the suite of parameters analyzed as part of the existing monthly monitoring program, as well as stable water isotopes to improve understanding of surface and groundwater flow paths in the upper reaches of Dome Creek and the mill area. Analytical results from water quality samples were compared to Canadian Council of Ministers of Environment (CCME) guidelines for the protection of Freshwater Aquatic Life (FAL) and the current care and maintenance water license QZ19-055.

The key findings of the July 2021 audit are as follows:

1) Placer mining on Victoria Creek has been relatively inactive in the past 5 years and water quality on Victoria Creek is consistent between all sampled locations upstream of Back Creek,
2) Minnesota Creek exhibits distinct water quality compared to Victoria Creek, and has elevated background concentrations of several licensed parameters,
3) Pony Creek and Back Creek are impacted by placer activity into their headwaters, making background water quality sampling no longer achievable, and
4) Zinc concentrations were elevated and increasing in recent years at several locations in the mill area; however, zinc concentrations in Dome Creek are effectively attenuated before flows reach Victoria Creek.

Water Resources Branch recommends the following with respect to the Mount Nansen site:

1) Begin regular sampling of the Victoria Creek reference sampling location "VC-BG" in order to establish background water quality for Victoria Creek,
2) Continue regular sampling of Pony Creek and Back Creek and take potential placer impacts into consideration during analysis of sample data,
3) Continue regular sampling of Minnesota Creek location "MN" to develop a long-term record of background water quality on Minnesota Creek,
4) Continue monitoring the upper reaches of Dome Creek and seeps in the mill area to track elevated zinc concentrations in this area,
5) Consider the installation of multi-level monitoring wells in the mill area and upgradient of Dome Creek, and
6) Consider analyzing stable water isotopes in samples collected from the mill and upper Dome Creek areas.

Table of Contents

1 Introduction/Background

The Mount Nansen/*Enozhí Ddhäw* property is located on Little Salmon/Carmacks First Nation (LS/CFN) Traditional Territory approximately 45 km West of the Village of Carmacks. The Mount Nansen/*Enozhí Ddhäw* site itself is comprised of several quartz deposits and the area has seen mining activity since as early as the 1940's, including significant placer mining in adjacent and surrounding properties. In 1999, the Mount Nansen/Enozhí Ddhäw site was officially abandoned and the Government of Canada took over responsibility for the site. The Government of Yukon led remediation planning and was responsible for care and maintenance, including environmental monitoring, until September 2021, immediately following issuance of the care and maintenance water license (QZ19-055) in August 2021. In parallel, LS/CFN, Government of Canada, and Mount Nansen Remediation Limited Partnership (MNRLP) signed an agreement in 2019 to remediate and close the site and continue environmental monitoring.

All surface water leaving the Mount Nansen property flows via Dome Creek to Victoria Creek which travels to the Nisling River/*Nínlin Gé*, onto to the Donjek River/*Dänzhù̀r Chù'* and finally to the Yukon River/*Tàgé Cho*. The downstream-most sampling location monitored in Victoria Creek is VC-R, located approximately 5 km upstream of the confluence with the Nisling River/*Nínlin Gé*. This location captures influence from the Mount Nansen/*Enozhí Ddhäw* site as well as the extensive placer mining in the catchment.

2 Purpose and Objectives

In order to determine audit objectives WRB reached out to LS/CFN, Crown-Indigenous Relations and Northern Affairs Canada (CIRNAC), and Assessment and Abandoned Mines (AAM) to determine each group's interest and concerns with the site. These were the primary informers of audit objectives and WRB structured field sampling to address these interests and concerns and collect the most valuable and informative data during the site visit. These objectives are outlined below:

1) Identify potential sampling locations for background water quality on Pony Creek, Back Creek, and Victoria Creek upstream of placer mining influence, as well as a potential long-term sampling location on Minnesota Creek. Water samples were collected at the potential sampling locations to provide a basis for determining whether or not current background/reference samples on these creeks are representative or if sampling locations should be relocated to better quantify background conditions and placer impact.
2) Investigate and assess surface water in the mill area, specifically Dome Creek and any other seeps or surface water surrounding the mill and known adits. Any surface water located will be sampled to support investigations into the recent elevated zinc concentrations observed in samples collected in the mill area.
3) Evaluate existing site documents and reports surrounding groundwater, the Brown-McDade pit, and the seep pond within the context of monitoring upcoming closure activities. This will materialize in the form of a desktop investigation of all relevant and available groundwater data and reports.

3 Methods and Materials

3.1 Methods and Equipment for Sampling and Field Measurements

Sample collection was completed by WRB staff using best practices for water sampling and according to the specifications of the labs performing analysis. WRB staff adhered to standard sampling methods outlined by Environment and Climate Change Canada (ECCC) and Government of Yukon Department of Environment guidance documents. In-situ water quality field parameters were measured for each sample collected using YSI ProDSS Handheld Multimeters which were calibrated by WRB staff as per manufacturer specifications prior to entering the field.

Samples collected during the July 2021 site visit were analyzed for a host of analytical parameters as outlined in Table 1. These parameters were chosen to support site audit objectives as well as allow for comparison against site-specific effluent quality standards

as outlined in licence QZ19-055 and water quality guidelines outlined by the Canadian Council of Ministers of the Environment long-term Guidelines for Protection of Aquatic Life (CCME-PAL). Sampling locations have been indicated on **Error! Reference source not found.**. It should be noted that water license QZ19-055 was issued on August 19, 2021, which is after WRB fieldwork took place.

Bureau Veritas (BV) was contracted for water chemistry analysis for all parameters except for stable water isotopes, which were analyzed separately by the University of Waterloo Environmental Isotopes Laboratory. In situ field measurements for pH and specific conductivity were submitted with the unfiltered samples for analysis of stable water isotopes. Isotope ratios were measured using a Los Gatos Research Liquid Water Isotope Analyser, model T-LWIA-45-EP with a precision (2σ) of $\delta^2H = \pm 0.8$ ‰ and $\delta^{18}O = \pm 0.2$ ‰. The complete analytical results for BV analysis (Appendix A) and isotope analysis (Appendix B) are attached.

Table 1. Analysis performed for all samples collected during the July 2021 site audit.

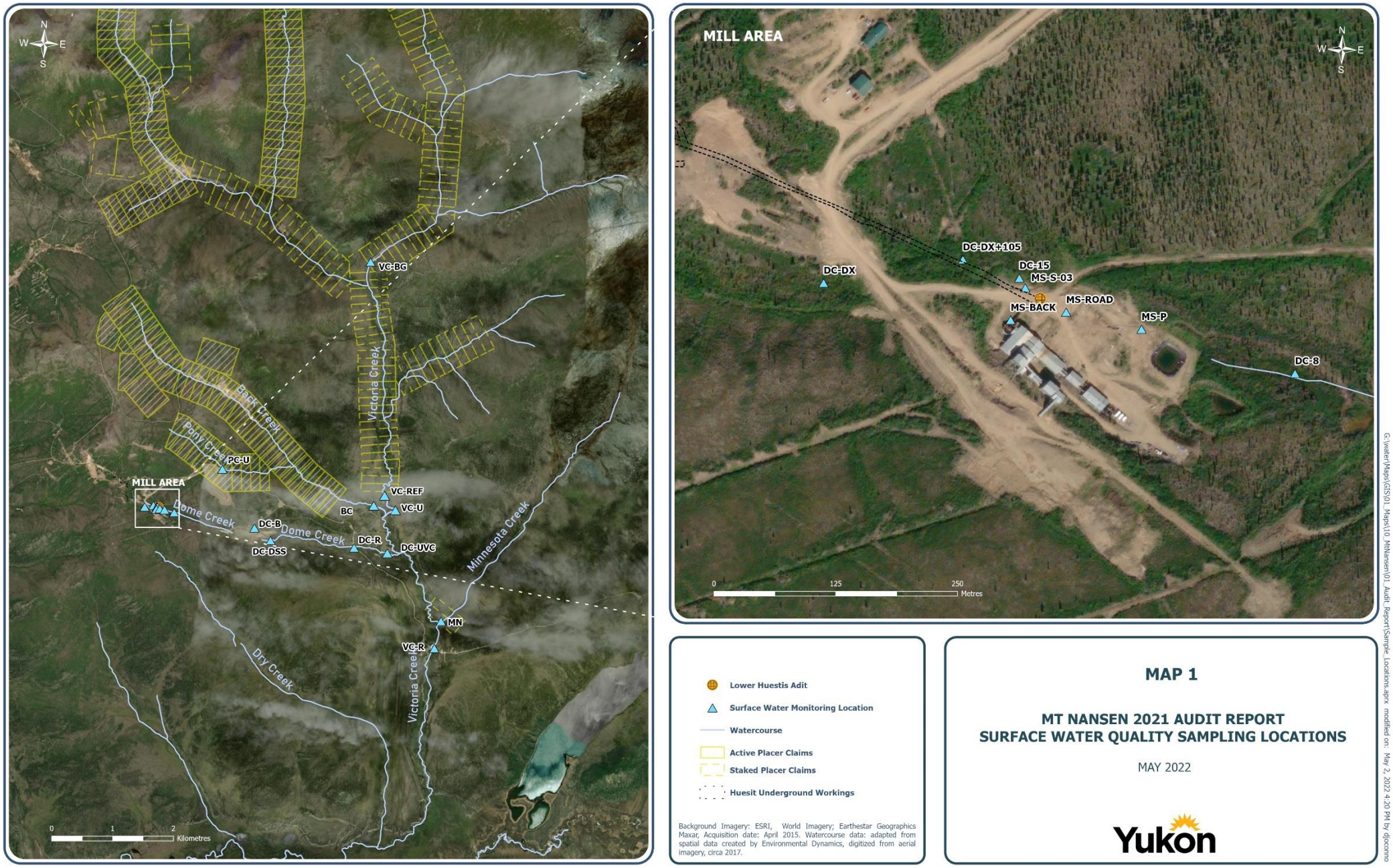
Parameter
- Total & Dissolved Metals
- General Elemental Chemistry
- Alkalinity
- Conductivity
- Hardness
- Chloride
- Sulphate & Sulphide
- Cyanate, Cyanide (SAD & WAD)
- Dissolved Organic Carbon
- Ammonia, Un-Ionized Ammonia
- Nitrogen, Nitrate & Nitrite
- Stable Isotopes in Water (Limited to Dome Creek, Pony Creek and mill area sites)

WRB staff collected eighteen surface water samples during the July 2021 site audit, outlined in Table 2 below. These sampling stations were selected in order to support audit objectives and existing sampling locations were sampled wherever possible. This included samples on Victoria Creek, Pony Creek, Back Creek, Dome Creek and surface water in the mill area. The exact sampling locations are depicted in Map 1.

Table 2. Surface water samples collected during the July 2021 site audit.

Station Code	Location	Date & Time Sampled	Coordinates		Rationale
			Lat	Long	
DC-DX	Dome Creek upstream of mill access road crossing	2021-07-14 9:05	-137.1475	62.04559	Most upstream sampling location on Dome Creek, represents background Dome Creek water quality
DC-DX+105	Dome Creek approximately 105 m downstream of mill access road crossing	2021-07-14 13:15	-137.14551	62.04579	Upstream sampling location on Dome Creek exhibiting increasing zinc concentrations between 2019 and 2021 sampling events
DC-15	Dome Creek emergent channel north of MS-S-03	2021-07-14 10:30	-137.144142	62.045765	Upstream sampling location on Dome Creek to provide further insight into increasing zinc on upper Dome Creek sites
MS-S-03	Seep collecting in ditch north of Mill	2021-07-14 9:55	-137.14371	62.04569	Monitoring mill seep with existing long term record
DC-8	Dome Creek down gradient of mill	2021-07-14 13:10	-137.138677	62.04494109	Sampling location downgradient of mill where flow becomes discontinuous, travelling to ground and emerging in several locations
MS-BACK*	Pooled water at north side of mill structure	2021-07-01 9:45	-137.132851	62.04753135	Mill site investigation
MS-ROAD*	Seep east of mill structure	2021-07-14 11:15	-137.14324	62.04553	Mill site investigation
MS-P*	Seep east and downgradient of mill structure	2021-07-14 13:30	-137.141727	62.045323	Mill site investigation

DC-B	Dome Creek at bridge	2021-07-14 10:45	-137.11398	62.04306	Dome Creek adjacent to tailings facility
DC-R	Dome Creek at road	2021-07-14 09:15	-137.08181	62.04078	Dome Creek downstream of tailings facility
PC-U	Pony Creek upstream	2021-07-14 09:45	-137.12396	62.05159	Pony Creek adjacent to Brown-McDade Pit, downstream of placer activity
DC-DSS	Dome Creek downstream of seep	2021-07-14 10:20	-137.139673	62.04598772	Dome Creek downstream of confluence with Seep Pond discharge
DC-UVC	Dome Creek upstream of Victoria Creek	2021-07-14 09:00	-137.06973	62.04043	Dome Creek at confluence with Victoria Creek
VC-REF*	Victoria Creek approximately 500 m upstream of VC-U	2021-07-13 11:45	-137.073869	62.048352	Potential sampling location for more accurate background on Victoria Creek
VC-BG*	Upstream most accessible sampling location by ground on Victoria Creek	2021-07-12 15:25	-137.079605	62.08279	Upstream most Victoria Creek sampling location accessible through placer operation, Potential sampling location for more accurate background on Victoria Creek
VC-U	Victoria Creek upstream of Back Creek	2021-07-13 10:50	-137.07188	62.04463	Current Victoria Creek background sampling location
VC-R	Victoria Creek at Road	2021-07-13 14:30	-137.05593	62.0263	Downstream most Victoria Creek sampling location
BC	Back Creek	2021-07-13 10:20	-137.0722	62.0449	Back Creek downstream of placer impact
MN	Minnesota Creek	2021-07-12 15:05	-137.05483	62.03001	Minnesota Creek upstream of VC-R
***Not regularly sampled**					



Map 1. Site and sampling overview. .

3.2 QA/QC

In addition to standard samples collected from site, WRB completed four Quality Assurance/Quality Control (QA/QC) samples to comply with sampling best practices referenced above. QA/QC samples collected have been outlined in Table 3 below.

Table 3. QA/QC samples completed during the July 2021 site audit.

QA/QC Sample Type Collected	Procedure	Purpose
Travel Blank	Lab that is providing sample bottle sets provides an additional set filled with lab grade deionized water and sealed. This sample is carried for the duration of the sampling event, returned to the lab and never opened until analysis.	Can help identify if any contaminants have been introduced into the sample during or as a result of the transportation process.
Field Blank	A sample bottle set is filled with lab grade deionized water in the field by sampling staff following all the standard protocols and procedures of a normal sample.	Can help identify if any contaminants have been introduced into the sample from the atmosphere at the sampling location or from sampling staff handling protocols and procedures.
Replicate (x2)	A regular sample is collected followed immediately by an identical replicate sample being collected adhering to all of the same standard protocols and procedures. One replicate is collected for every ten samples, rounded up to the nearest ten samples. Analytical results are compared and Relative Percent Difference (RPD) is calculated.	Can help identify precision of sampling technique and methods and provide an estimate of sampling error and analytical error.

3.3 Documents and reports reviewed

One of the objectives of this report is to review existing site documents and reports. The documents used in this study include:

- Water Licence QZ19-055 which authorizes the Care and Maintenance activities at the Mt Nansen site, issued August 19, 2021 and available on Waterline
- Mount Nansen Care and Maintenance Adaptive Management Plan, December 17, 2021 available on Waterline (report submitted on December 17, 2021)

- Monthly monitoring water quality data submitted by the Licencee (MNRLP)
- Mount Nansen 2021 Annual Report, available on Waterline (report submitted March 31, 2022)
- Archer, Cathro and Associates Assessment Report for B.Y.G. Natural Resources Inc. & Chevron Canada Resources Ltd (filed March 28, 1988)
- Tetra Tech Initial Site Characterization Report, Mount Nansen Webber Lease, Yukon, 2020
- MNRLP YESAA Project Proposal Hydrogeological Existing Conditions Report 2020

4 Results

4.1 QA/QC Samples

All QA/QC samples analyzed with July 2021 samples returned results within expected range as indicated in Table 4. These results confirm that both field sampling and laboratory analysis were sufficiently accurate and precise. Detailed analytical results for QA/QC samples can be found in Appendix B.

Table 4. Results from QA/QC sample analysis performed on July 2021 site audit samples.

<table>
<tr><th>QA/QC Sample</th><th colspan="5">Results</th></tr>
<tr><td>Travel Blank</td><td colspan="5">All parameters analyzed in Travel Blank resulted in values below detection limit. There are no suspected contaminants introduced into the samples during or as a result of the transportation process.</td></tr>
<tr><td>Field Blank</td><td colspan="5">All parameters analyzed in Field Blank resulted in values below detection limit. There are no suspected contaminants introduced into the samples from the atmosphere at the sampling location or from sampling staff handling protocols and procedures.</td></tr>
<tr><td rowspan="8">Replicate 1</td><td colspan="5">Surface Water Sample DC-DX+105</td></tr>
<tr><td colspan="5">Average RPD for all analysis was found to be 3.8%. Individual parameters with RPDs >10% have been listed below.</td></tr>
<tr><td>Parameter</td><td>Detection Limit (mg/L)</td><td>Parent (mg/L)</td><td>Replicate (mg/L)</td><td>RPD (%)</td></tr>
<tr><td>Dissolved Organic Carbon</td><td>0.2</td><td>1.5</td><td>1.2</td><td>22</td></tr>
<tr><td>Ammonium</td><td>0.005</td><td>0.028</td><td>0.018</td><td>43</td></tr>
<tr><td>Nitrate</td><td>0.002</td><td>0.0137</td><td>0.0121</td><td>12</td></tr>
<tr><td>Total Lead</td><td>0.00002</td><td>0.0000381</td><td>0.0000302</td><td>23</td></tr>
<tr><td>Total Selenium</td><td>0.000006</td><td>0.00006</td><td>0.000054</td><td>10</td></tr>
<tr><td rowspan="13">Replicate 2</td><td colspan="5">Surface water sample BC</td></tr>
<tr><td colspan="5">Average RPD for all analysis was found to be 6.9%. Individual parameters with RPDs >10% have been detailed below.</td></tr>
<tr><td>Parameter</td><td>Detection Limit (mg/L)</td><td>Parent (mg/L)</td><td>Replicate (mg/L)</td><td>RPD (%)</td></tr>
<tr><td>Total Cadmium</td><td>0.000002</td><td>0.0000859</td><td>0.0000717</td><td>18</td></tr>
<tr><td>Total Nickel</td><td>0.0001</td><td>0.000679</td><td>0.00077</td><td>12</td></tr>
<tr><td>Ammonium</td><td>0.005</td><td>0.0056</td><td>0.0081</td><td>36</td></tr>
<tr><td>Dissolved Lead</td><td>0.000001</td><td>0.0000163</td><td>0.0000191</td><td>15</td></tr>
<tr><td>Total Lead</td><td>0.00002</td><td>0.0000705</td><td>0.000098</td><td>32</td></tr>
<tr><td>Dissolved Phosphorus</td><td>0.001</td><td>0.0036</td><td>0.003</td><td>18</td></tr>
<tr><td>Total Phosphorus</td><td>0.002</td><td>0.0036</td><td>0.0081</td><td>79</td></tr>
<tr><td>Total Silicon</td><td>0.05</td><td>6.73</td><td>5.99</td><td>11</td></tr>
<tr><td>Total Suspended Solids</td><td>1</td><td>2</td><td>1.2</td><td>50</td></tr>
<tr><td>Total Zinc</td><td>0.001</td><td>0.00162</td><td>0.0013</td><td>22</td></tr>
<tr><td rowspan="5">Isotope Replicate</td><td colspan="5">Isotope sample DC-DX+105</td></tr>
<tr><td>Isotope</td><td>Result</td><td colspan="3">RPD (%)</td></tr>
<tr><td rowspan="2">$\delta^{18}O$</td><td>-22.44</td><td colspan="3" rowspan="2">0.40</td></tr>
<tr><td>-22.53</td></tr>
<tr><td rowspan="2">$\delta^{2}H$</td><td>-172.08</td><td colspan="3" rowspan="2">0.44</td></tr>
<tr><td>-172.85</td></tr>
</table>

Water Resources Branch analyzed samples for stable water isotopes (δ^2H and $\delta^{18}O$) to support interpretations of site water movement. All natural waters contain variable ratios of elemental isotopes of different masses. The principle element ratios of interest for isotope tracing are Oxygen ($^{18}O/^{16}O$, also referred to as $\delta^{18}O$) and Hydrogen ($^{1}H/^{2}H$, also referred to as $\delta^{2}H$), although isotopes of other elements are sometimes used. The ratio of the lighter isotopes to heavier isotopes provides information about the environment of formation or source of the containing waters. Water molecules enriched in heavier ^{18}O isotopes do not evaporate as readily from surface water bodies, causing surface waters that have stagnated for long periods of time to gradually become enriched in ^{18}O. Precipitation that condenses in warmer temperatures (rain) is generally more enriched in ^{18}O than lighter precipitation that condenses in colder temperatures (snow).

Figure 1 shows δ^2H and $\delta^{18}O$ ratios for surface water samples (solid circles) collected during the July 2021 monitoring event and precipitation (hollow circles) collected in Whitehorse from 1960-1990 via the Global Network of Isotopes in Precipitation (GNIP; IAEA 2021). Precipitation that fell between May and September is inferred to be rain (red hollow circles) whereas precipitation that fell between October and April is inferred to be snow (blue hollow circles). A local meteoric water line (LMWL) was generated based on the stable water isotope ratios for precipitation samples collected from the Whitehorse GNIP station. The LMWL is a line of best fit ($R^2 = 0.93$) that represents the site-specific long-term covariation of hydrogen and oxygen stable isotope ratios. The LWML may not be fully applicable to the Mount Nansen property but no closer GNIP stations exist.

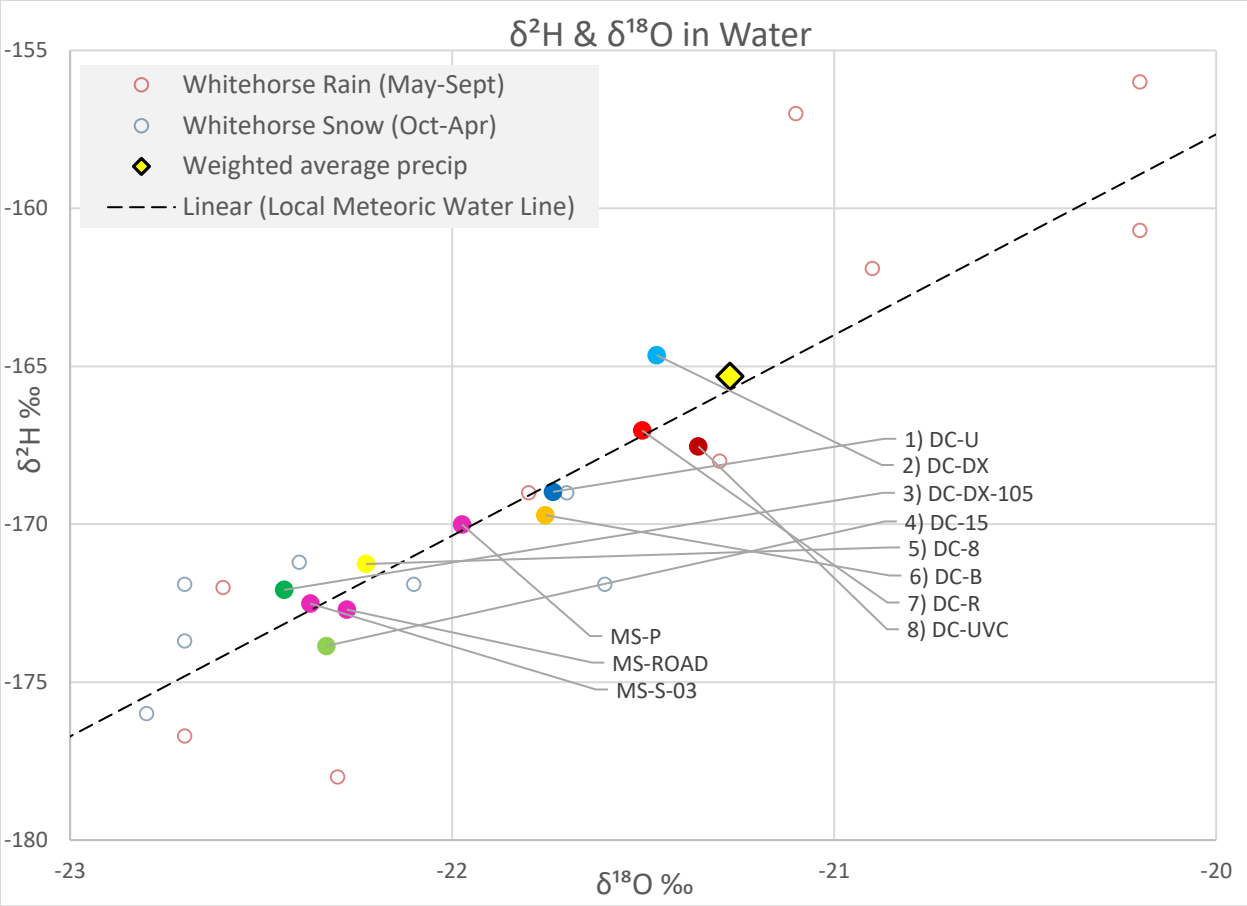


Figure 1. Stable water isotopes for samples collected on Dome Creek and in the mill area. Dome Creek sites are numbered from upstream to downstream.

4.2 Surface Water Quality Observations

4.2.1 Site-Wide Comparison with Standards and Guidelines

Licence QZ19-055 outlines the Effluent Quality Standards (EQS) for all discharge from the water treatment plant from grab samples collected at the monitoring station called "WTP". These standards apply only at this station and have been outlined in Table 5 below. Note that the water treatment plant was not yet installed at the time of licensing thus there are no associated GPS coordinates for this location. Additionally, the MNRLP 2022 Adaptive Management Plan outlines Water Quality Objectives (WQOs) for Dome Creek station DC-R, as well as the Victoria Creek station VC-UMN. During the July 2021 sampling event there were no WQO exceeded.

Table 5. Effluent quality standards for discharge leaving the water treatment plant site "WTP", outlined in license QZ19-055.

Parameter	Maximum Concentration
pH	6.0 to 9.5 *pH Units*
Total Suspended Solids	15 mg/L
Unionized Ammonia-N	1.00 mg/L
Arsenic (Total)	0.03 mg/L
Iron (Total)	0.5 mg/L
Manganese (Total)	3.1 mg/L
Zinc (Total)	0.06 mg/L
96-Hour Rainbow Trout LC50 at 100% Concentration	Non-toxic

Data from the July 2021 water sampling was compared to the CCME long-term Water Quality Guidelines for the Protection of Aquatic Life to provide additional basis of comparison (Table 6). These guidelines are intended to describe a generic threshold under which freshwater life is protected from anthropogenic stressors such as chemical inputs or changes to composition. These guidelines are numerical limits or narrative statements based on scientifically defensible toxicological data available at the time a particular guideline was developed. Guideline values are meant to protect all forms of aquatic life and all aspects of the aquatic life cycles, including the most sensitive life stage of the most sensitive species over the long term. Ambient water quality guidelines developed for the protection of aquatic life are meant to provide a science-based benchmark for a nationally consistent level of protection for aquatic life in Canada. It should be noted that several water quality guidelines are calculated using in-situ parameters such as pH or temperature and are therefore variable.

Table 6. CCME long-term Water Quality Guidelines for the Protection of Aquatic Life.

Parameter	Maximum Concentration
Aluminum (Total)	*Calculated, variable*
Ammonia (Total)	*Calculated, variable*
Arsenic (Total)	0.005 mg/L
Cadmium (Total)	*Calculated, variable*
Chromium (Total)	0.0089 mg/L
Copper (Total)	*Calculated, variable*
Cyanide (WAD)	0.005 mg/L
Iron (Total)	0.3 mg/L
Lead (Total)	*Calculated, variable*
Manganese (Total & Dissolved)	*Calculated, variable*
Mercury (Total)	0.000026 mg/L
Molybdenum (Total)	0.073 mg/L
Nickel (Total)	*Calculated, variable*
Nitrate	13 mg/L
pH	6.5 to 9.0 pH units
Selenium (Total)	0.001 mg/L
Silver (Total)	0.00025 mg/L
Thallium (Total)	0.0008 mg/L
Turbidity	*Calculated, variable*
Uranium (Total)	0.033 mg/L
Zinc (Total)	*Calculated, variable*

Water quality results have been compared to the EQS listed in water license QZ19-055 and to the long-term CCME guidelines for the protection of aquatic life. It should be noted that the EQS only apply at station WTP. Additionally, the EQS have been used in this study for comparison only and not for assessment of compliance. A number of samples were measured above the EQS as well as CCME guidelines as outlined in Table 7.

Table 7. Standard and guideline comparison of samples collected during the July 2021 site audit.

Purple: Concentrations measured above CCME guidelines.
Blue: Concentrations measured above QZ19-055 effluent quality standards for water treatment plant location "WTP".
Red: Exceeds both CCME and QZ19-055.

Station	Parameter	July 2021 Concentration
DC-15	Arsenic (Total)	0.00911 mg/L
	Cadmium (Total)	0.0154 mg/L
	Zinc (Dissolved)	2.96 mg/L
	Zinc (Total)	3.11 mg/L
DC-8	Arsenic (Total)	0.0816 mg/L
	Iron (Total)	11 mg/L
	Total Suspended Solids	93 mg/L
DC-B	Arsenic (Total)	0.0107 mg/L
	Iron (Total)	1.7 mg/L
DC-DX	Arsenic (Total)	0.0122 mg/L
	Iron (Total)	1.52 mg/L
DC-DX+105	Arsenic (Total)	0.0247 mg/L
	Cadmium (Total)	0.0385 mg/L
	Copper (Total)	0.00451 mg/L
	Zinc (Dissolved)	4.42 mg/L
	Zinc (Total)	4.5 mg/L
DC-R	Arsenic (Total)	0.00899 mg/L
	Iron (Total)	0.513 mg/L
DC-U	Arsenic (Total)	0.0152 mg/L
	Iron (Total)	1.38 mg/L
DC-UVC	Arsenic (Total)	0.0078 mg/L
MN	Iron (Total)	1.54 mg/L
MS-BACK	Arsenic (Total)	0.049 mg/L
MS-P	Arsenic (Total)	0.0404 mg/L
	Cadmium (Total)	0.0217 mg/L
	Copper (Total)	0.00843 mg/L
	Lead (Total)	0.00888 mg/L
	Zinc (Dissolved)	2.23 mg/L
	Zinc (Total)	2.07 mg/L
MS-ROAD	Arsenic (Total)	0.0379 mg/L
	Cadmium (Total)	0.0013 mg/L
	Zinc (Dissolved)	0.1 mg/L
	Zinc (Total)	0.101 mg/L
MS-S-03	Arsenic (Total)	0.101 mg/L
	Cadmium (Total)	0.0672 mg/L
	Copper (Total)	0.019 mg/L
	Iron (Total)	0.484 mg/L
	Zinc (Dissolved)	6.5 mg/L
	Zinc (Total)	6.73 mg/L
PC-U	Cadmium (Total)	0.0013 mg/L
	Copper (Total)	0.00524 mg/L
	Iron (Total)	0.783 mg/L
	Zinc (Total)	0.112 mg/L

4.2.2 Victoria Creek Assessment

The majority of Victoria Creek upstream of the Mount Nansen site has been staked for placer mining but there is no mining activity on the majority of these claims. There are three active placer mining water licenses on unnamed tributaries of Victoria Creek that have been relatively dormant in the past five years according to the regional Compliance, Monitoring and Inspections (CMI) officer: PM16-076, PM13-026 and PM17-085. These operations are located approximately 5 km north of the Mount Nansen property, and the current QZ19-055 background sampling location on Victoria Creek VC-U is located downstream of these operations (**Error! Reference source not found.**).

WRB collected two additional samples on Victoria Creek upstream of VC-U. The site VC-REF was chosen based on a historic sampling location found in WRB's database, and is located approximately 900 m upstream of the VC-R location. This existing sampling location at VC-REF had 58 sampling events on record in the WRB database between October 3, 2007 and January 14, 2014. VC-REF is however also located downstream of PM16-076, PM13026, and PM17-085. A new site "VC-BG" was sampled at the upstream-most location accessible on Victoria Creek, approximately 5 km upstream of the VC-U location as well as upstream of PM16-076, PM13026, and PM17-085. The sampling event on July 12, 2021 is the first and only data point for VC-BG that WRB has on record. The purpose of sampling this location was to assess background water quality on Victoria Creek as accurately as possible and to compare water quality upstream and downstream of the three placer mines between VC-BG and VC-REF. It should be noted though that there is an unnamed creek feeding into Victoria Creek between these two stations which may influence Victoria Creek water quality.

As depicted in Figure 2 and Figure 3, concentrations of the parameters listed in QZ19-055, namely Al, As, Cu, Fe, S, Mn, Zn and Sb, display stable concentrations between the three locations in Victoria Creek. Concentrations across all three locations were very low and do not exceed CCME guidelines. In addition to the samples collected in July 2021, the entire data record available for VC-REF was compared against records from the same dates for VC-U using box and whisker plots. As depicted in Figure 4 and Figure 5, the Al, As, Cu, Fe, Mn and Zn concentrations observed over time, between October 2007 and January 2014, are very similar at VC-REF and VC-U. Data for sulfur

and antimony for this period is sparse or unavailable and was not included in these figures.

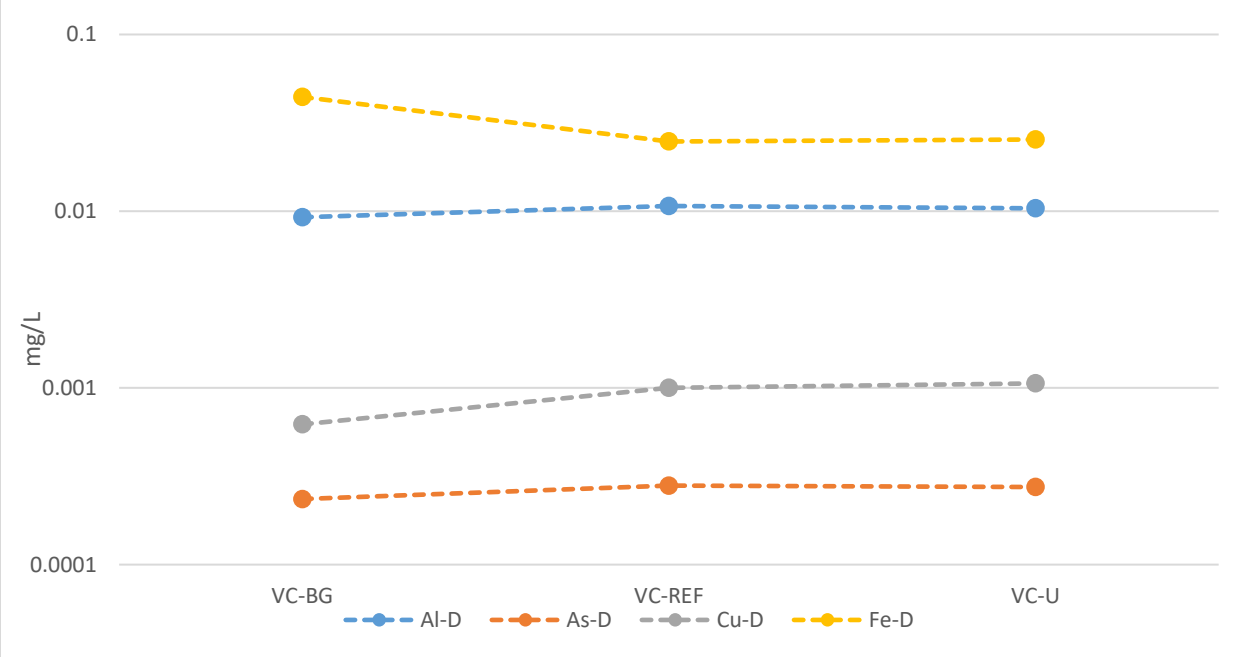


Figure 2. Dissolved Al, As, Cu and Fe concentrations at the sampling locations in the upper reach of Victoria Creek (from upstream to downstream). Note log-10 scale.

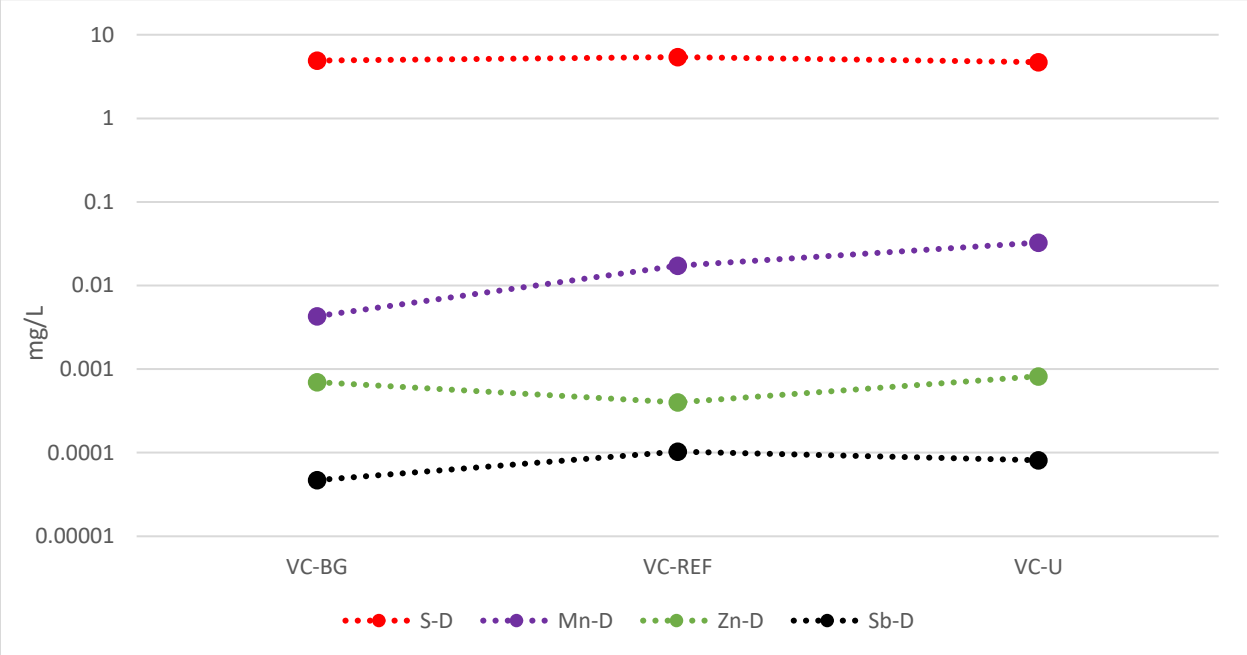


Figure 3. Dissolved S, Mn, Zn, and Sb concentrations at the sampling locations in the upper reach of Victoria Creek (from upstream to downstream). Note log-10 scale.

Note log-10 scale.

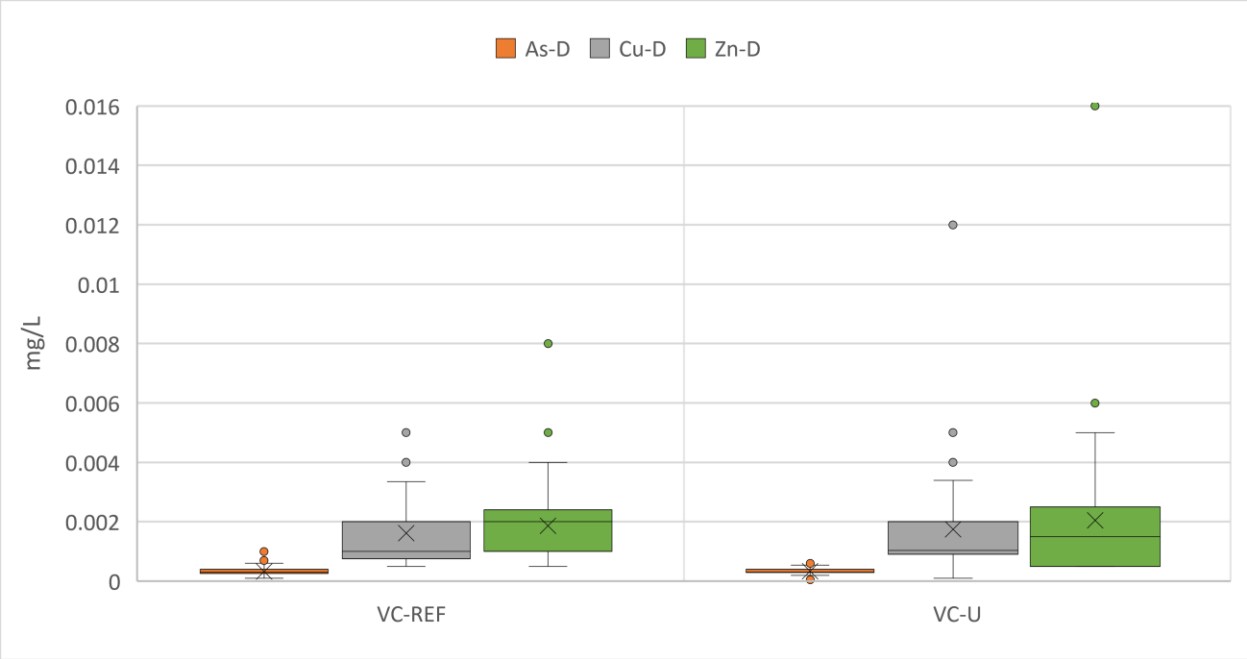


Figure 4. Dissolved As, Cu and Zn concentrations from sampling events where both VC-REF and VC-R were sampled between October 2007 and January 2014. Values below a method detection limit have been considered to be half of that method detection limit.

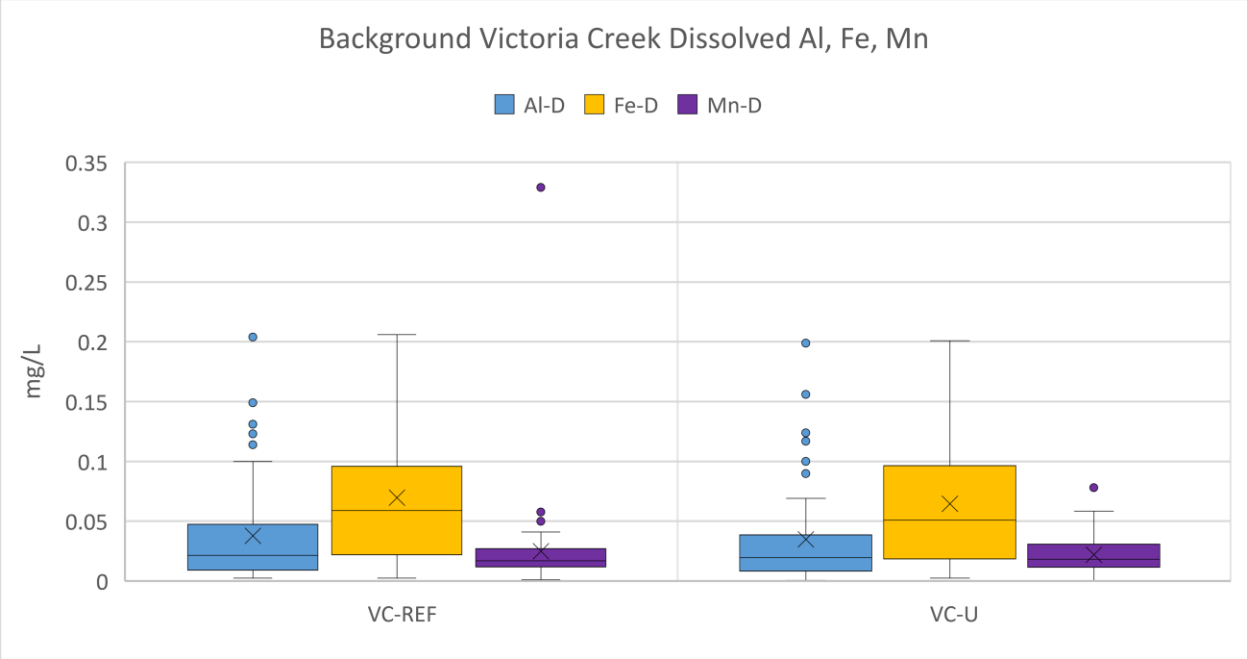


Figure 5. Dissolved Al, Fe and Mn concentrations from sampling events where both VC-REF and VC-R were sampled between October 2007 and January 2014. Values below a method detection limit have been considered to be half of that method detection limit.

4.2.3 Minnesota Creek Investigation

There are currently no placer mining water licenses, no known vehicle access routes, and no known active or historic placer mining on Minnesota Creek. There are two staked placer claims at the downstream-most extent, immediately upstream of the confluence with Victoria Creek. These claims are FIV 1 (grant number P 527362) and FIV 2 (grant number P 527363), both staked in 2021. Given this information, Minnesota Creek is considered un-impacted and therefore representative of background conditions for that creek.

Although Minnesota Creek station MN is not a regular license sampling location, WRB has 25 sampling events on record for that station spanning from November 17, 2011 to November 13, 2013, as well as three sample records in 2021. This entire available record of sample data for MN was compared against records from the same dates for upstream and downstream sites VC-UMN and VC-R respectively using box and whisker plots, though data for sulfur and antimony for this period is sparse or unavailable and was not included in these figures.

Figure 6 and Figure 8 below display upstream water quality at VC-UMN, and downstream water quality at VC-R after mixing with MN. MN exhibited mean concentrations greater than both VC-UMN and VC-R for all license parameters on record and appears to have a notable impact on downstream VC-R water quality. As displayed in Figure 6 and Figure 8, concentrations of arsenic, copper, zinc, aluminum, iron and manganese increase after mixing with MN. It seems that Minnesota Creek has elevated background concentrations for these parameters even though there is no past or current mining activity on that creek. Figure 7 and Figure 9 indicate that the concentrations observed in July 2021 samples confirm that MN exhibits background concentrations that are greater than those of the upstream Victoria Creek station VC-UMN. During the July sampling event, all three sites exhibited concentrations in the lower range of the historic values observed in the 2011 – 2013 record available to WRB.

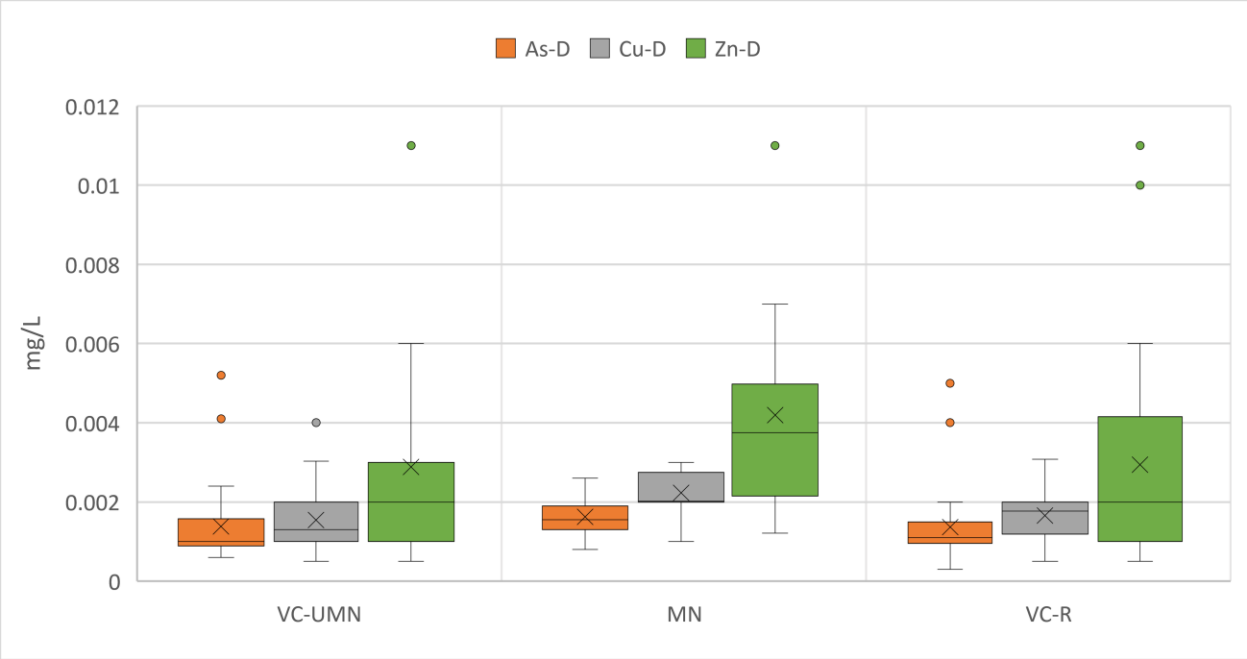


Figure 6. Dissolved As, Cu and Zn concentrations from sampling events where VC-UMN, MN and VC-R were sampled in 2011-2013. Values below a method detection limit have been considered to be half of that method detection limit.

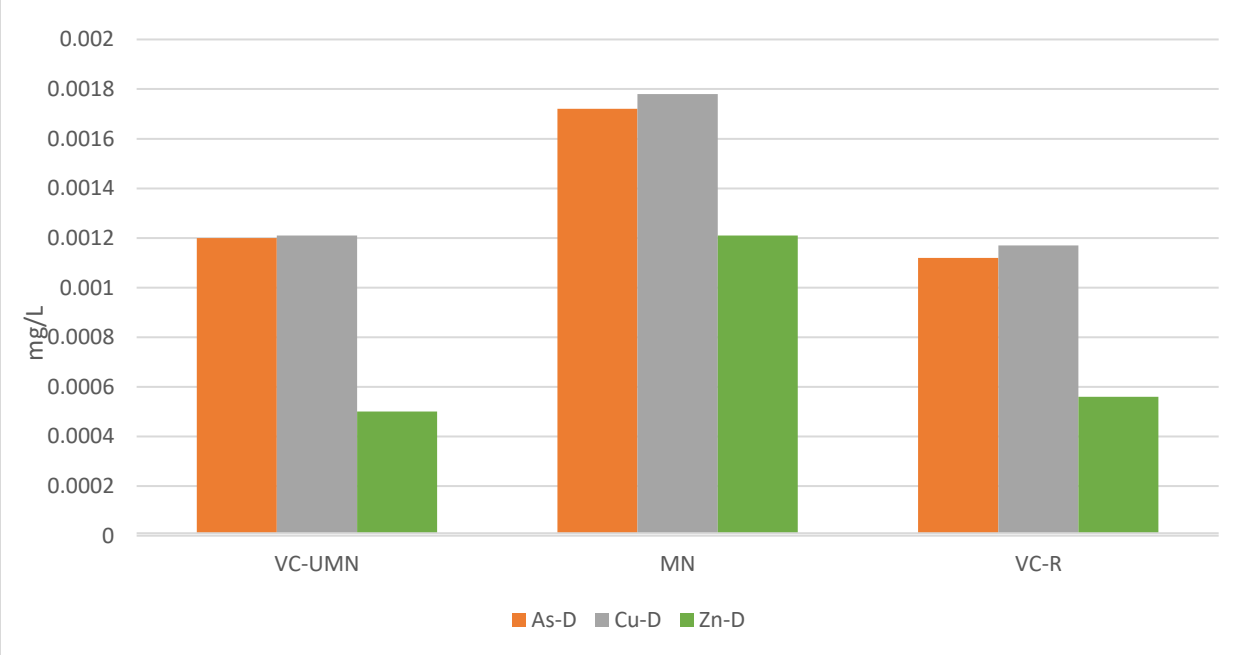


Figure 7.Dissolved As, Cu and Zn measured at VC-UMN, MN and VC-R during the July 2021 sampling event.

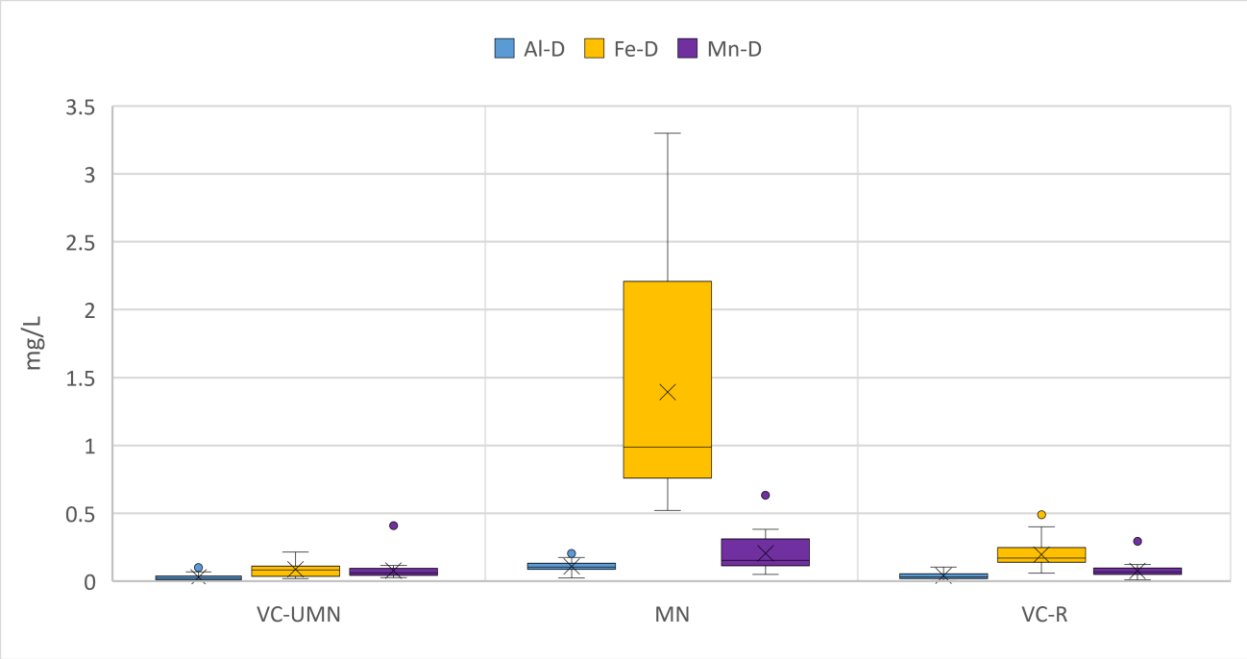


Figure 8. Dissolved Al, Fe and Mn concentrations from sampling events where VC-UMN, MN and VC-R were sampled in 2011-2013. Values below a method detection limit have been considered to be half of that method detection limit.

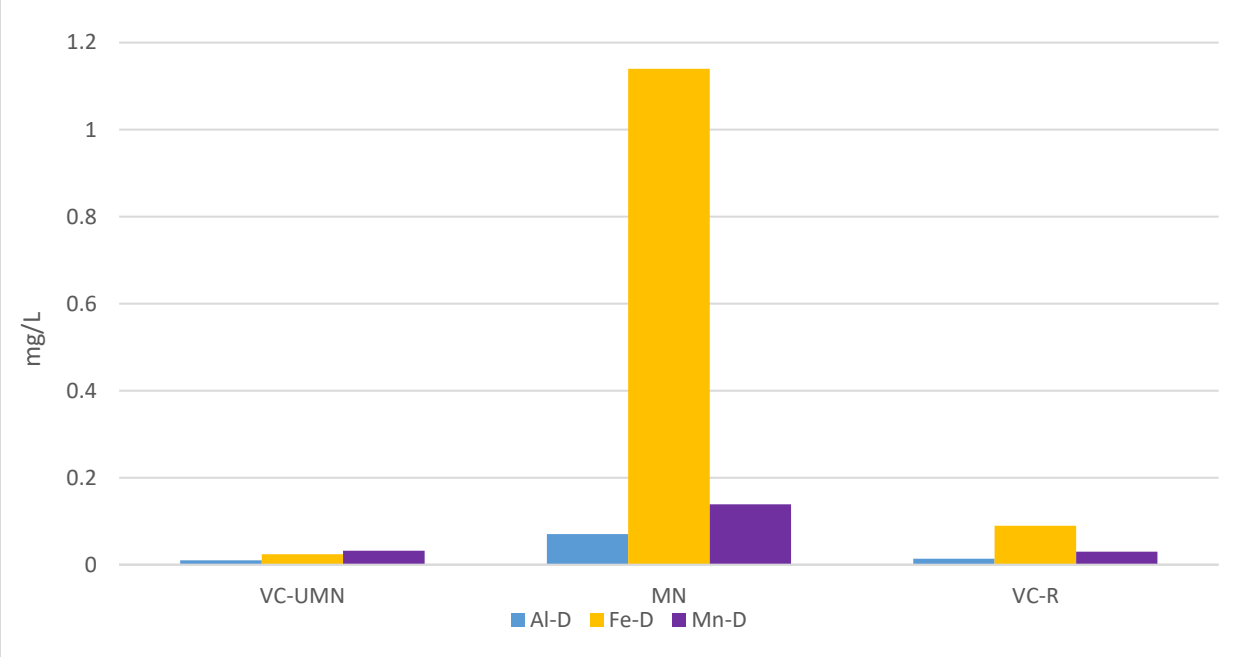


Figure 9. Dissolved Al, Fe and Mn measured at VC-UMN, MN and VC-R during the July 2021 sampling event.

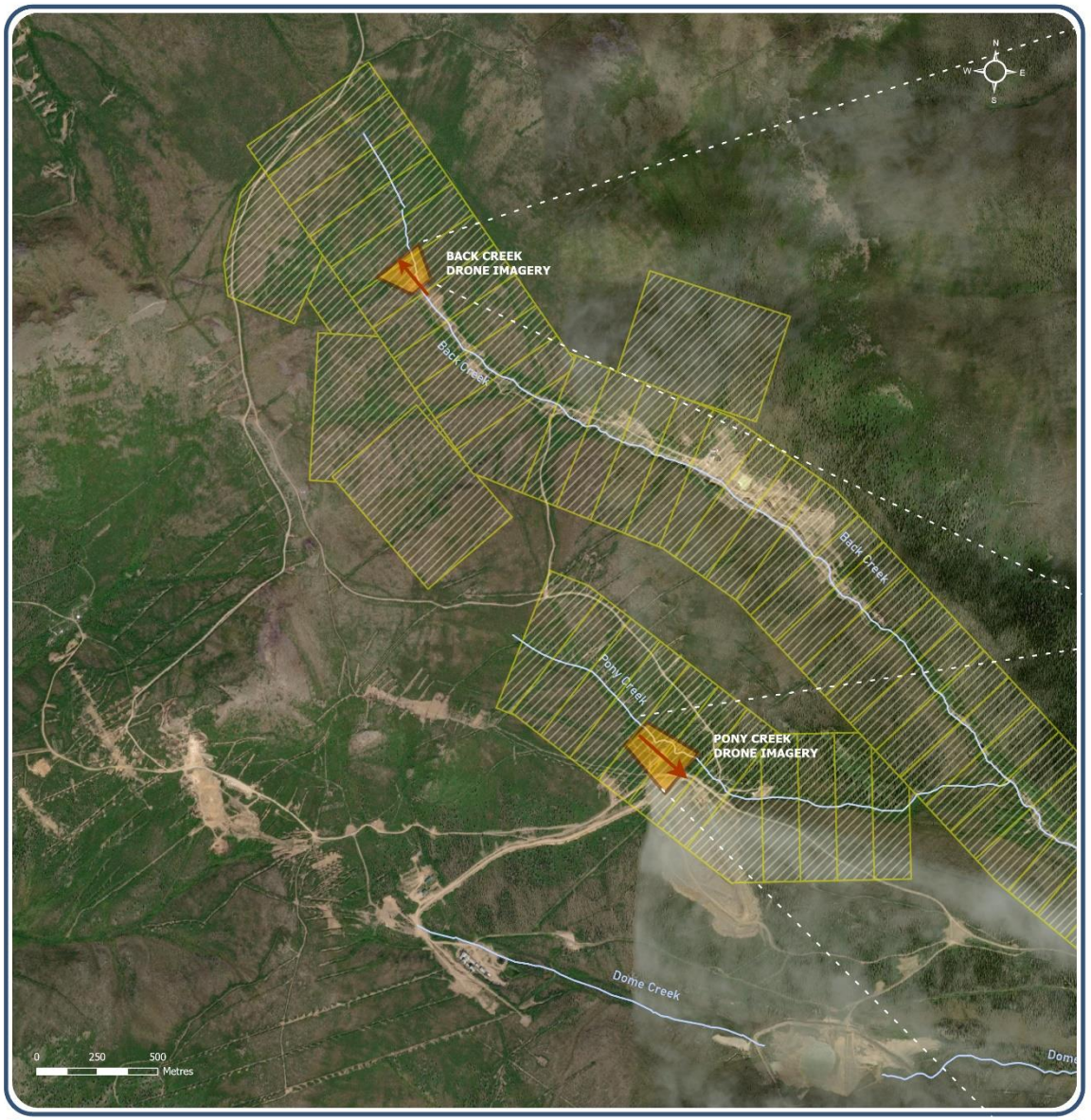
4.2.4 Pony Creek & Back Creek Investigation

There are currently active placer mining operations on Pony Creek (PM11-022) and Back Creek (PM19-056) which are in close proximity to the Mount Nansen property and flow into the same receiving watercourse: Victoria Creek. Mount Nansen monthly monitoring samples are currently collected downstream of these placer operations and WRB attempted to locate viable sampling locations on these creeks upstream of placer influence during the July 2021 visit.

On July 12, 2021 a field crew explored the upstream extents of both Pony Creek and Back Creek on foot to locate unimpacted surface water. The field crew also made use of a small aerial drone to photograph these areas from above (

Map 2). The upstream-most flowing headwater was found to be emerging from ground within the upstream extent of the placer operations, with flows estimated to be under 1L/s emerging from multiple heavy equipment scours or natural hollows, then pooling and accumulating in potholes and ditches within the placer operations. Standing pools of surface water were located upgradient of the placer operations. These pools were suspected to be remnant of precipitation or snowmelt from the late spring with no visible flow or connectivity to any prominent main channel. During the July 2021 site visit,

Pony Creek and Back Creek were exhibiting low flows in general. The crew could not locate suitable sampling locations upstream of the placer mines on these two creeks.



Yukon

Active Placer Claims
Watercourse

MAP 2
MT NANSEN 2021 AUDIT REPORT
DRONE IMAGERY AND APPROXIMATE FOOTPRINT

G:\water\Maps\GIS\01_Maps\10_MtNansen\01_Audit_Report\Drone_Views.aprx modified on: April 26, 2022 11:11 AM by dlpcomp

Map 2. Placer drone photo locations.

4.3 Desktop Study Results

4.3.1 General Hydrogeology

As a part of the 2019 Mt. Nansen Care and Maintenance Project Water License Application, an assessment of the existing hydrogeological conditions was carried out at the site (AMEC, 2017). The groundwater monitoring network consists of monitoring wells and piezometers, mostly installed during a 2013 field investigation. Few monitoring wells existed prior to this program, mostly in the vicinity of the Brown-McDade pit. The locations of all routine groundwater sampling locations incorporated in this study are presented in Figure 10 (MNRLP, 2019). The locations of all water level monitoring locations are presented in Figure 11.

The lowest groundwater levels on site are usually observed in April, consistent with the general trend of the Yukon's groundwater fluctuations. Groundwater contours and a hydrogeological conceptual model was developed for the site in 2017, presented in Figure 11 (MNRLP, 2019). All groundwater wells in the Pony Creek, Dome Creek and mill areas are depicted in **Error! Reference source not found.**.

388000 388500 389000 389500 390000

6881500 6881000 6880500

N

Ketza Yard
GLL07-01 Levellogger
MW09-15 Levellogger
PONY CREEK ADIT
Pony Creek
Pit Pond Datalogger
BROWN McDADE PIT
Extent of Inactive Claim Areas
CH-P-13-04/10
Access Road
Order in Council Boundary
GLL07-03 Levellogger Barologger
CH-P-13-05/50 VWP
CH-P-13-06/10,20,30,40,50 VWP
CAMP AREA
WASTE ROCK AREA
Ketza Road
"Shale" Borrow Area
Dome Creek
CH-P-13-01/10
CH-P-13-03/10 VWP
Power Line Road
MILL COMPLEX
CH-P-13-02/10,20,30,40,50 VWP
"Shale" Borrow Area
Historical Landfill
Former Explosive Storage Area
Access Road
Bridge
Sand Borrow Area
Dome Creek
TAILINGS FACILITY
Tailings Dam
Seepage Dam
Seepage Pond
Sand Borrow Area
MW09-04 Levellogger
MW09-03 Levellogger
Diversion Channel
MW09-21 Levellogger
MW09-23 Levellogger

Data Source:

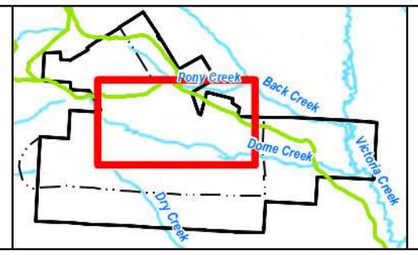
Roads, trails, streams, waterbodies, watercourses and infrastructure areas digitized using 2008 Quickbird imagery (courtesy of Yukon Geomatics) and spatial data provided by Yukon government.

Heli LIDAR Data Survey and Imagery, 2012

Datum: NAD 1983 CSRS UTM Zone 8N

Legend

- Order in Council Boundary
- Extent of Inactive Claim Areas
- Public Road
- Road
- Stream
- Diversion Channel
- Contour (20 m)
- Contour (5 m)
- Groundwater Monitoring Installations
- Historic Monitoring Wells
- Dataloggers
- Disturbed Area



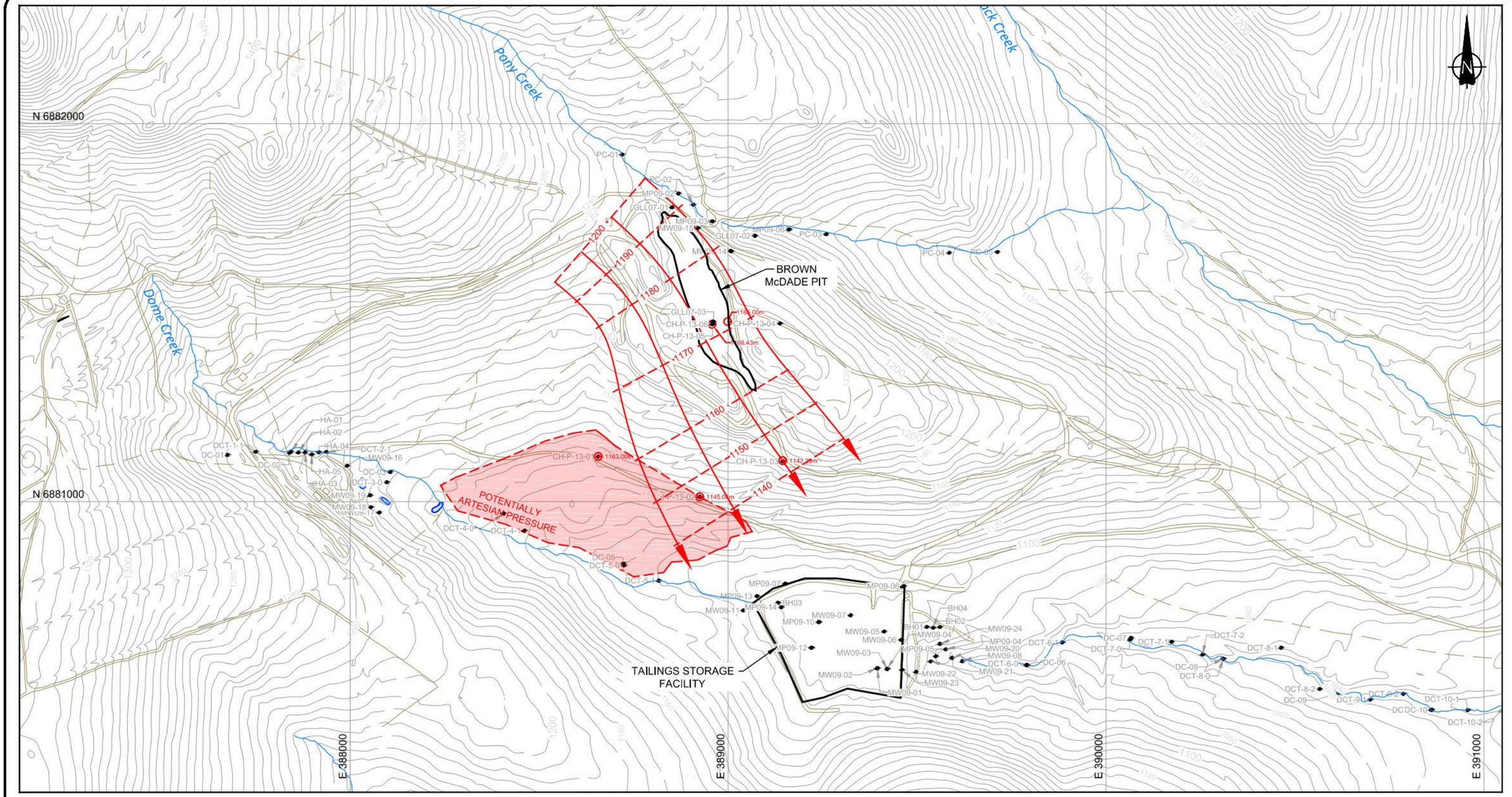
Yukon
Energy, Mines and Resources
Assessment and Abandoned Mines

MOUNT NANSEN SITE
FIGURE 5.0-1
CARE AND MAINTENANCE
PROJECT PROPOSAL
SITE DISTRIBUTION OF EXISTING
GROUNDWATER MONITORING LOCATIONS

Scale 1:6,500
Metres
0 130 260

February 22, 2017

Figure 10 - Groundwater monitoring locations (Mt. Nansen Remediation LP, 2017)



Data Source:
Datum: NAD 1983 CSRS UTM Zone 8N

Note: Groundwater and Ground Temperature data will be updated in 2014.

0m 100 200 300 400

1 : 10000

Yukon
Energy, Mines and Resources
Assessment and Abandoned Mines

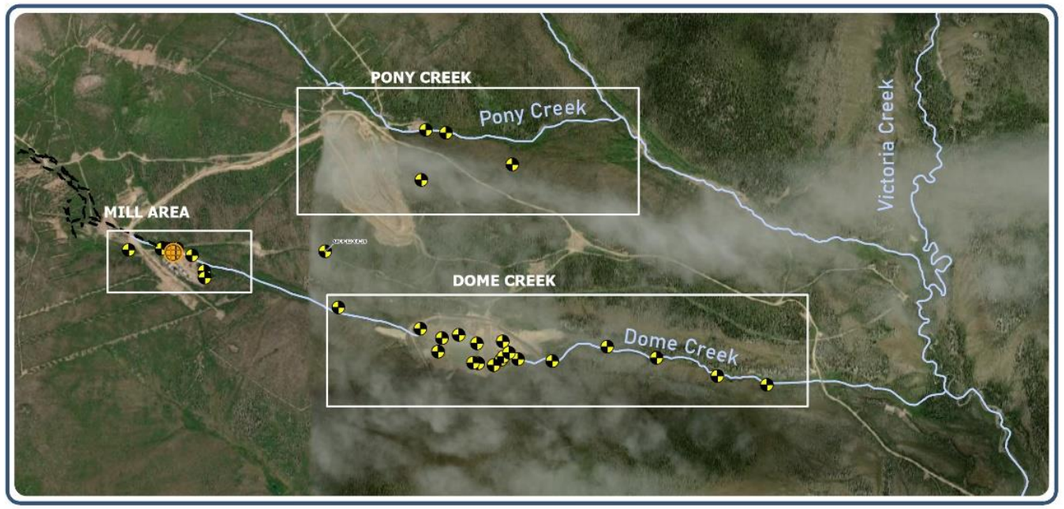
MOUNT NANSEN SITE
Figure 6.3-1

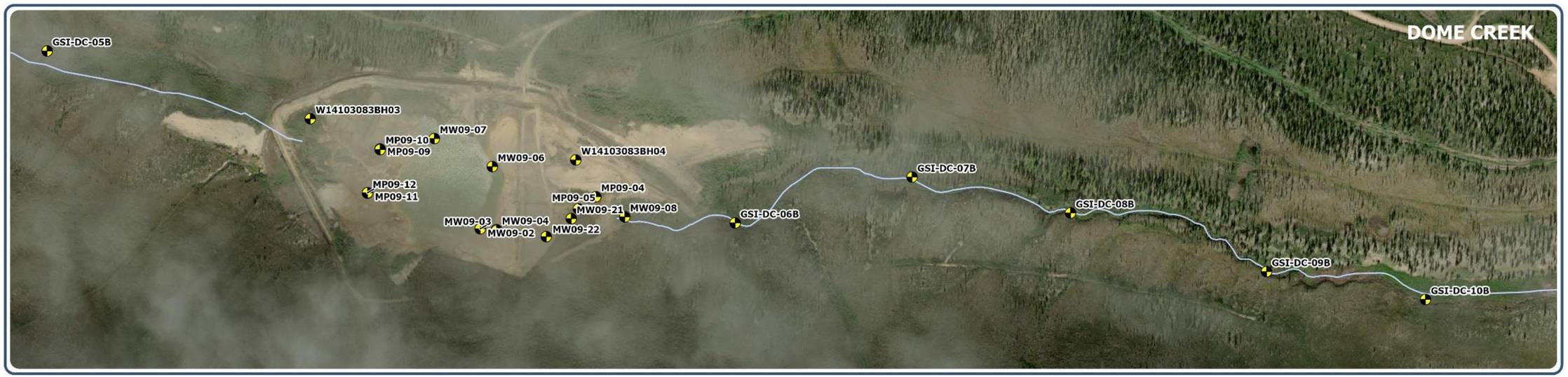
CARE AND MAINTENANCE PROJECT PROPOSAL

GROUNDWATER ELEVATIONS FOR REGIONAL FLOW

FEBRUARY 2017

Figure 11 - Groundwater contours for regional flow (Mt. Nansen Remediation LP, 2017)





Lower Huestis Adit

Groundwater Monitoring Location

Watercourse

AOI

Background Imagery: ESRI, World Imagery; Earthestar Geographics Maxar, Acquisition date: April 2015. Watercourse data: adapted from spatial data created by Environmental Dynamics, digitized from aerial imagery, circa 2017.

MAP 3

MT NANSEN 2021 AUDIT REPORT
GROUNDWATER MONITORING LOCATIONS

MAY 2022

Yukon

G:\water\Maps\GIS\01_Maps\10_MtNansen\01_Audit_Report\Sample_Locations.aprx modified on: May 2, 2022 4:20 PM by djsconno

Map 3. Groundwater wells overview

4.3.2 General Groundwater Geochemistry

A study carried out in 2017 by AMEC Foster-Wheeler (Burnaby, BC) assessed site-wide groundwater quality and elevations (AMEC Foster-Wheeler, 2017). Groundwater sampled from all piezometers and monitoring wells were found to be magnesium-calcium type, with sulfate and (to a lesser extent) carbonate alkalinity representing the dominant anionic species depending on location on site. This is consistent with expected compositions given the presence of local sulfidic ore minerals and the Yukon-wide commonality of carbonate minerals. Groundwater samples from the tailings management area were more varied in composition, with a higher percentage of carbonate alkalinity-dominant samples and a greater range in concentrations of sodium and potassium (AMEC Foster-Wheeler, 2017). Evaluation of trends in groundwater chemistry is restricted by a paucity of data, as groundwater monitoring only began in 2007 and consistent (roughly twice-yearly) monitoring was not implemented until 2009.

Parameters of interest for local groundwater determined through comparison of site data with applicable CCME and BC WQ guidelines include NH_4, NO_3^-, NO_2^{2-}, SO_4^{2-}, CN^-, Al, As, Cd, Co, Cu, Fe, Se, Sb, and Zn (AMEC Foster Wheeler, 2019). These parameters consistently exceeded guidelines at multiple sampling stations. Other parameters of interest have been identified from localized exceedances in certain regions, exceedances not temporally or geochemically consistent, or as detailed by the water use license.

4.3.3 Brown-McDade Pit Groundwater Exchange

Seeps have been observed in the lower sections of the Brown-McDade pit wall nearest to Pony Creek (AMEC, 2017). Hydraulic conductivity measured via packer testing of a well installed at the base of the Brown-McDade pit showed relatively low values for the fractured granite that composes the bottom of the pit. However, assessment of hydraulic gradients indicates that pit water drains consistently to groundwater year-round and flows roughly South-South East, consistent with the surrounding topography.

Monitoring wells, piezometers, and surface water quality sites in the Pony Creek drainage and Brown-McDade pit area are inspected and sampled as part of monthly monitoring events where possible. The geochemical trends observed in the samples taken from the pit area show relatively high conductivity (~400 to ~3250 µS/cm), and are calcium-magnesium-carbonate-sulfate type waters (AMEC, 2017). Some regions show higher degrees of sulfate dominance, indicative of the influence of reactive ore materials in or near the pit.

Pony Creek monitoring well GSI-PC-03B, approximately 200 m downstream of the pit, shows a much greater conductivity than the preceding stations. This increase in conductivity corresponds with an increase in sulfate concentration, which may indicate the influence of pit-associated reactive ore minerals on groundwater at this location. This well shows the highest concentrations of dissolved elements of concern. Concentrations are less (some below-guideline levels) at the furthest downstream station on Pony Creek (GSI-PC-05B).

The geochemical data indicate the potential influence of mine pit waters on Pony Creek somewhere between MP09-08 and GSI-PC-03B. Isotope analysis of pit waters and near-streambed water samples at this location in Pony Creek would confirm this hypothesis.

4.3.4 Zinc in Groundwater

Zn concentrations have been above the BC WQG hardness-dependent guideline (0.03 mg/L) since at least 2009 (between 3 and 10 mg/L) in the monitoring well MW09-16, which is located approximately 100 m northeast of the centre of the mill site (AMEC, 2017). Other sampled piezometers, including those in the GSI-HA series with intermittent sampling records from 2007 to 2016, showed frequent exceedances as well. These exceedances were all between 0.03 mg/L and 0.07 mg/l, and most other observations were less than 0.01 mg/L (Appendix E, pg. 30). From 2016 to 2021, similar concentrations were observed for these piezometers in the range of 0.001 mg/L to 1.63 mg/L, with the highest concentration observed at GSI-HA-04A during the August 25, 2021 sampling event carried out by Hemmera.

5 Analysis and Investigation of Dome Creek

5.1 Dome Creek and Groundwater Exchange

Dome Creek begins approximately 300 m West-North West of the current mill site and runs generally westward adjacent to the mill and the tailings pond. Dome Creek eventually discharges into Victoria Creek, the primary water discharge pathway for the Mt. Nansen mine site. A number of monitoring wells, piezometers, and surface water quality sites located in the headwaters, mill area, and lower reaches are inspected and sampled as part of monthly monitoring events.

Sampling data available to WRB for stations DC-DX, DC-DX+105 and MS-S-03 between August 2019 and July 2021 had some gaps; during which time a significant spike in zinc concentrations in the mill area occurred. As depicted in Figure 12, zinc concentration at reference location DC-DX is substantially below the QZ19-055 EQS standard (0.06 mg/L) in for the entire period of record, whereas zinc concentrations at the next two sites on the Dome Creek flow path (DC-DX+105 and MS-S-03) exceed the total zinc standard in the licence during almost all sampling events. Total zinc concentrations during the July 2021 sampling event at DC-DX+105 were 75 times the licence standard, and total zinc at MS-S-03 was over 100 times the licence standard. The spatial distribution of this zinc spike is depicted in Map 4. It is important to note that the comparison of these concentrations against the QZ19-055 zinc standard is for comparison only and does not represent an exceedance or non-compliance event.

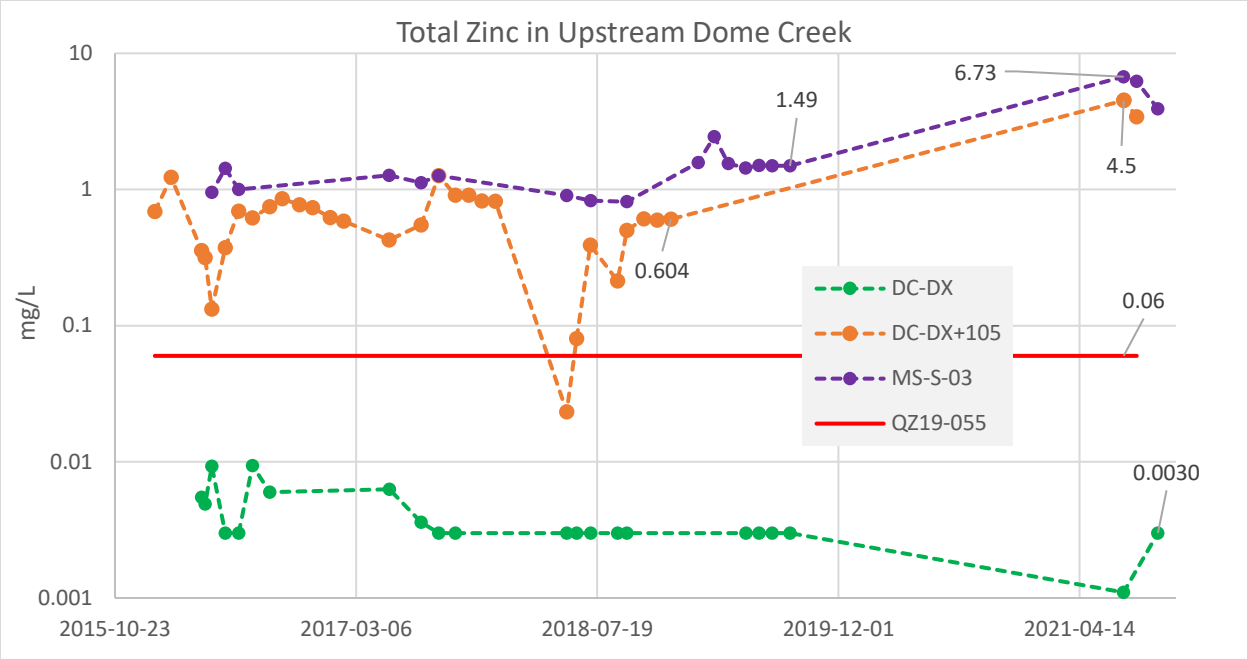
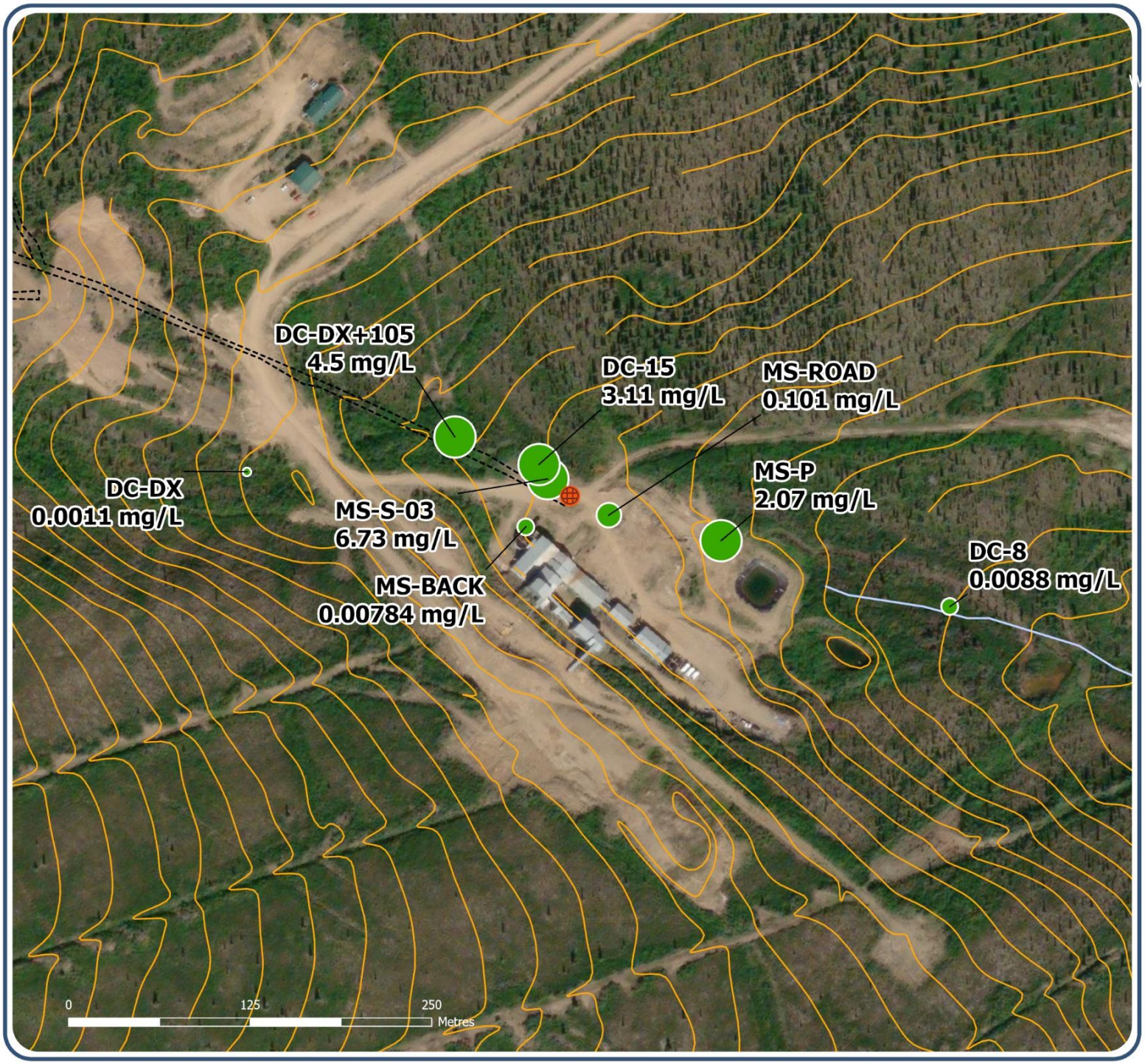


Figure 12. Total Zinc concentrations in Dome Creek stations in the mill area. Note log-10 scale.

As depicted in Figure 13 below, a historical image of the underground workings accessing the Huestis ore deposit was overlaid on a satellite image of the mill area using the locations of surface trenching visible in both images. Aligning the images indicates that DC-DX+105 and MS-S-03 are in close proximity to the location of the historic adit portal. This adit portal began full scale development in 1965, and samples collected at the lower Huestis adit in October of 1985 and June of 1986 indicate dissolved zinc concentrations were already elevated at that time at 1.10 mg/L and 1.34 mg/L, respectively. The zinc concentrations observed in 1985 and 1986 are over 18 times the current QZ19-055 dissolved zinc standard for effluent. For comparison, the mean concentration of total zinc at MS-S-03 during the past five years was 1.99 mg/L.



Lower Huestis Adit Historic Location

Huesit Underground Workings

Total Zinc in Surface Water Samples

- 0.000460 - 0.002375 mg/L
- 0.002376 - 0.030818 mg/L
- 0.030819 - 0.453344 mg/L
- 0.453345 - 6.730000 mg/L

Background Imagery: ESRI, World Imagery; Earthestar Geographics Maxar, Acquisition date: April 2015. Watercourse data: adapted from spatial data created by Environmental Dynamics, digitized from aerial imagery, circa 2017. Contour interval : 5 metre.

MAP 4

MT NANSEN 2021 AUDIT REPORT
MILL AREA TOTAL ZINC

MAY 2022

Yukon

Map 4. Zinc concentrations in mill area.

Figure 13. Approximate location of the Huestis adit workings, based on a digitized hand-drawn historical sketch.

All water samples taken from Dome Creek were sulfate-dominated with variable proportions of calcium and magnesium as the dominant cations. Based on the stable water isotope data, the uppermost section of Dome Creek (DC-DX) is principally fed by groundwater comprised of relatively shallow overburden flow characterized by greater $\delta^{18}O$ ratios (Figure 1). The geochemical data support this interpretation with generally lower dissolved minor ion concentrations than further downstream, and no CCME-Zn exceedances in the sampling record, although the major ion geochemistry is similar. At station DC-DX+105, the isotope signature closely resembles that of mill seep flow path MS-Road to MS-S-03, indicating the influence of a distinct groundwater flow path from the Dome Creek headwaters (Figure 1). The mill seeps show different minor but similar major ion geochemistry to the headwater region.

Gaining and losing reaches of Dome Creek were identified in AMEC Foster-Wheeler's 2017 report "Mt. Nansen Hydrogeological Existing Conditions Report" (AMEC, 2017). This study characterized vertical hydrogeological gradients, stream temperatures, and gaining or losing stream sections (net positive or net negative groundwater/stream flow interactions) for Dome Creek from headwaters to Victoria Creek. The vertical hydrogeological gradient was found to be upwards in the uppermost Dome Creek headwaters, accompanied by gaining seepage rates. Less than 100m downstream of the uppermost headwaters, the highest rate of losing seepage was observed. Another gaining section of stream was measured from ~100 m to ~300 m upstream of the tailings pond. Downstream of the TSF, all stream sections studied showed slightly gaining to slightly losing water budgets, indicative of a lesser influence of groundwater on these regions compared to the strongly losing and strongly gaining upper reaches.

Temperatures were consistently the warmest in the upper reaches of Dome Creek, in the range of 14°C to 16°C. The temperature assessment was carried out in September where the monthly mean air temperature was approximately 8.2°C, which may support the hypothesis of shallow, warmer groundwater flow more influenced by precipitation in the upper reaches of Dome Creek. Stream reaches after the TSF, believed to be less influenced by groundwater, showed colder temperatures ranging from 2°C to 16°C, skewed generally closer to colder temperatures.

This study also inferred groundwater contours by installing a series of piezometers in the headwaters of Dome Creek and the area suspected of containing the lower portal to the historical Huestis adit near the mill (GSI-HA-XX). These contours plotted above the local topographic gradient, further supporting the hypothesis that Dome Creek is groundwater-dominated in the upper reaches.

Most samples collected from Dome Creek for the entire sampling record show similar major ion geochemistry, namely Ca-Mg and bicarbonate-sulfate type waters. The dominant cations and anions change slightly with distance from headwaters, with DC-DX having consistently the lowest degree of sulfate dominance as concentrations

increase near the mill site (Figure 14). Minor ion chemistry shows obvious differences between stations, in the historic sampling record and in the 2021 WRB audit. Dissolved iron and manganese have historically been at their highest at the points nearest downstream of the mill site, but are believed to precipitate out by the monitoring stations further downstream (Mt. Nansen Remediation Limited Partnership, 2020). Other parameters that show a similar trend, with generally lesser degrees of attenuation downstream, are arsenic, aluminum, cadmium, and zinc (Mt. Nansen Remediation Limited Partnership, 2020).

5.2 Site-Wide Isotopic and Geochemical Observations

Surface water samples collected by WRB during the 2021 Nansen audit are generally HCO_3^- and SO_4^{2-} / Ca^{2+} and Mg^{2+} type waters. The distribution of major cations and anions on a per-watershed basis is presented in Figure 15. Watercourses sourced primarily from groundwater inputs, such as Dome Creek, tend to be more SO_4^{2-} dominated with no observable trend in cation dominance. Conversely, watercourses sourced primarily from precipitation such as Victoria Creek are principally HCO_3^- dominated, also with no observable trend in cation dominance. Seeps in the mill area are SO_4^{2-} dominated, which, along with the higher concentrations of dissolved metals observed in these samples, indicate the contribution of mining-related contamination to Dome Creek.

A possible linear relationship between $\delta^{18}O$ and $\delta^{2}H$ ratios and sulfate concentrations may indicate increasing sulfate concentrations as $\delta^{18}O$ decreases. Elevated sulfate concentrations in groundwater, particularly in mining areas, generally indicates an influence of sulfate-containing primary reactive minerals and groundwater subject to longer residence times (Figure 16).

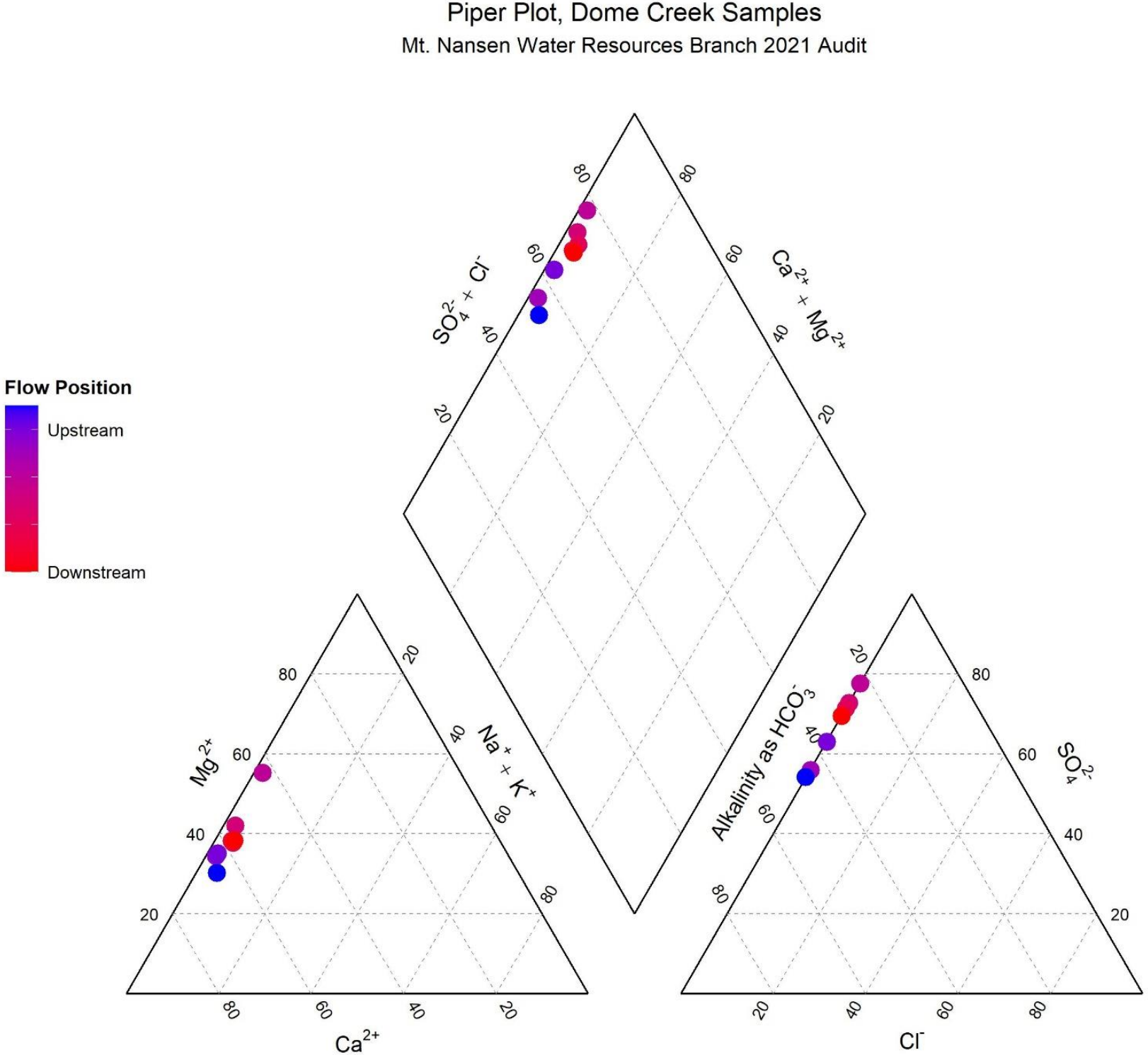


Figure 14 - Piper plot showing progression of major ion dominance along the Dome Creek flow path

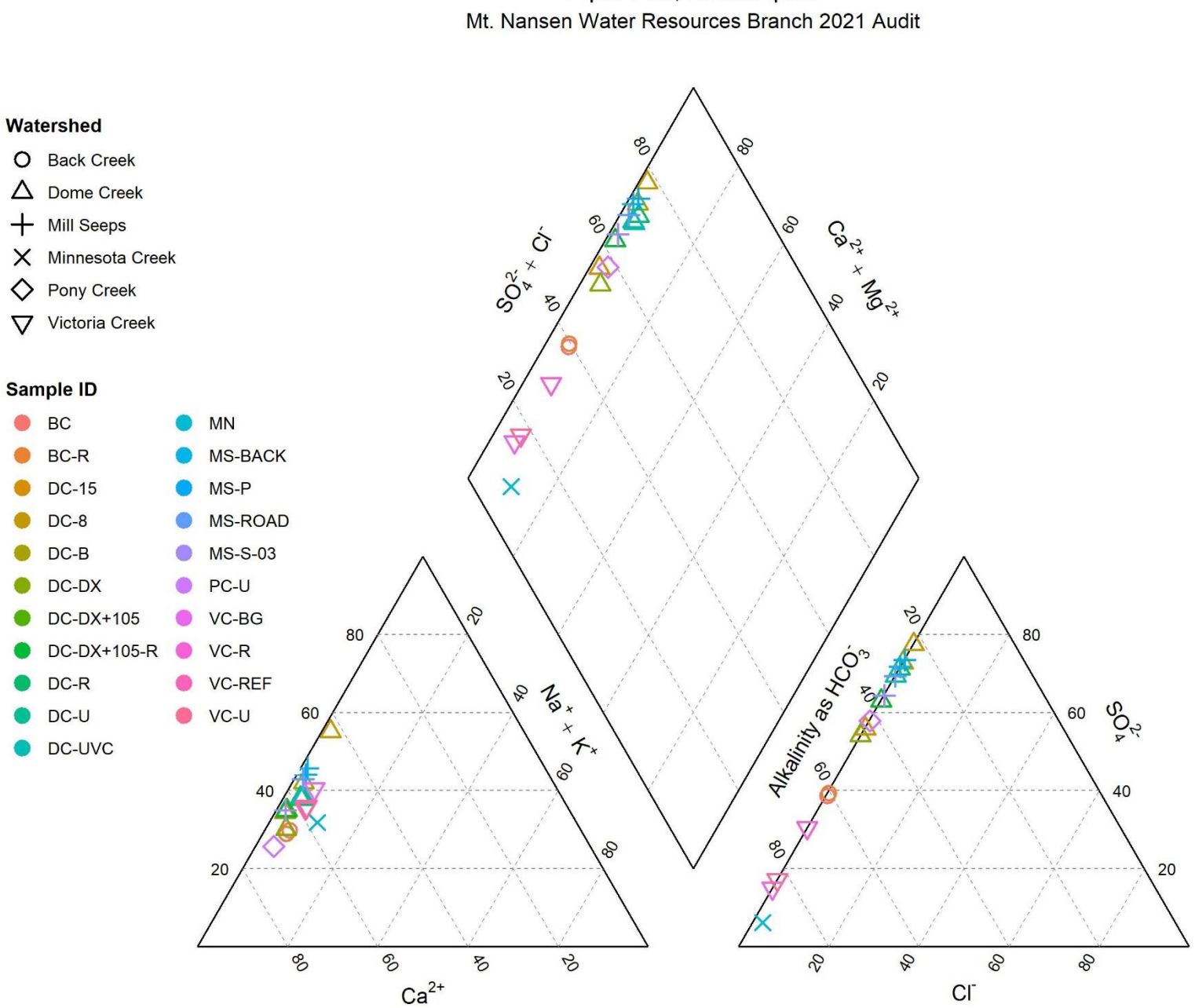


Figure 15 - Piper plot for all samples collected during the 2021 WRB audit

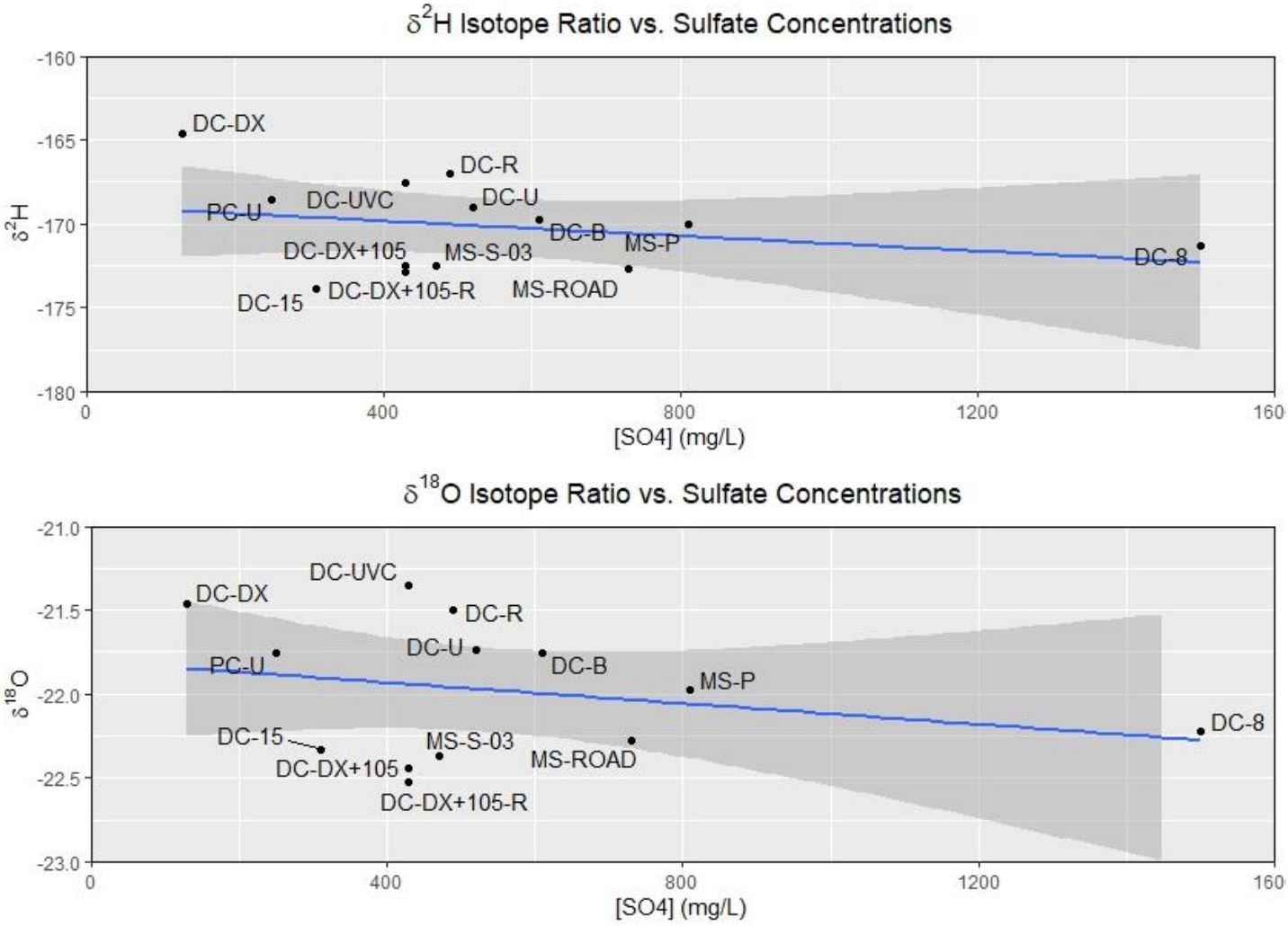


Figure 16. δ^2H and $\delta^{18}O$ ratios vs. sulfate concentrations

5.3 Groundwater Perspective on 2019 Zinc Spike

The increase in Zn concentrations observed in surface water sites in upper Dome Creek post-2019 was less readily apparent in piezometers local to the mill area. Although piezometer GSI-HA-04A showed its greatest (to date) dissolved Zn concentration in the August 2019 sampling event (1.63 mg/L), the other piezometers in the area did not show noteworthy changes in any major or minor geochemical parameters.

Steadily high Zn concentrations for the majority of the period of record for monitoring well MW-09-16 indicate that the spike in Zn concentrations observed in upper

Dome Creek as of 2019 are possibly indicative of a daylighting migrating contaminant front in local groundwater, or the influence of high groundwater levels resulting in dissolution of Zn-containing primary reactive minerals. Given the disturbed and uncharacterized nature of the subsurface mill area, this contaminant front could be migrating from an unidentified source near MW-09-16 (the mill area) or sourcing in part from a preferential groundwater flow pathway from the Huestis ore deposit through the Huestis adit to the mill area.

6 Conclusion and Recommendations

6.1 Additional Sampling Locations

Based on concerns expressed by LS/CFN, it is recommended that regular sampling of VC-BG be conducted to develop a record of background water quality on Victoria Creek upstream of all current placer mining activity. VC-BG is accessible by foot, ATV or UTV during most spring, summer and fall months and would be accessible by snowmobile during winter months. There may be a period during shoulder seasons where the site would be difficult or impossible to access due to poor road and snow conditions, however there are well established placer mining roads that can be used to access this site.

Sampling records for Minnesota Creek sampling location “MN” are sporadic or inconsistent and it is recommended that this site continues to be monitored monthly to further develop records and understanding of the unique background water quality on Minnesota Creek. Currently all quartz and placer mining impact in the Victoria Creek catchment is captured at VC-UMN, and Figure 6 and Figure 8 display that mean concentrations of license parameters on Minnesota Creek – which is unimpacted – are greater than the mean concentrations of all existing quartz and placer impact in the rest of the Victoria Creek catchment combined.

Based on the investigation during the July 2021 site visit, it is concluded that reference water quality on Back Creek and Pony Creek upstream of placer influence is

likely unattainable and may only be available during spring melt periods. As this spring melt would not effectively be representative of water quality in those creeks, Pony Creek and Back Creek should continue to be monitored downstream of these locations, however should not be considered background water quality.

6.2 Zinc Spikes in Mill Area

The source of zinc concentration spikes in upper Dome Creek is uncertain, and could be a result of mill pad construction activities or a preferential flow path along the Huestis adit, which used to access the Huestis ore deposit. Based on the low zinc concentrations in upper Dome Creek, and the elevated zinc concentrations in the mill area reaches of Dome Creek, it is unlikely that elevated zinc is a result of natural processes. However, zinc is almost completely attenuated by the time Dome Creek flows to DC-R. Based on this evidence and discussions with CIRNAC, it is recommended that Dome Creek monitoring remains unchanged and an adaptive management approach is taken to monitor if Dome Creek conditions change or worsen.

A lack of information regarding subsurface compositions and groundwater flow paths in the mill area could be rectified via installation of a multi-level monitoring well in the centre of the mill area or between DC-DX and DC-DX+105. This would help to delineate the depth of the contaminated substrate possibly contributing elevated concentrations of dissolved metals to Dome Creek. Another monitoring well installed upgradient of the mill site would establish background concentrations.

Isotope sampling of MS-Back and groundwater in the Huestis ore deposit area would enable comparison to isotopic data from the mill seeps sampled as a part of the present study, which would help differentiate the source of elevated dissolved metals between the Huestis adit groundwater flow path and the mill area itself. Sediment and/or precipitate sampling between DC-15 and DC-8 would inform conclusions regarding the degree of attenuation of these elements attributable to geochemical processes versus simple dilution. This analysis would help determine whether the attenuating factors are likely to persist, or if they may be overwhelmed as physical and geochemical parameters change.

7 Contact Information

Devon O'Connor (Audit Lead) – Water Quality Technologist
Devon.O'Connor@Yukon.ca

Cole Fischer – Groundwater Technologist
Cole.Fischer@Yukon.ca

Amelie Janin – Senior Scientist Water Quality
Amelie.Janin@Yukon.ca

Brendan Mulligan – Senior Scientist Groundwater
Brendan.Mulligan@Yukon.ca

Tyler Williams – Water Resources Scientist
Tyler.Williams@Yukon.ca

Marie Ducharme – Water Information Specialist
Marie.Ducharme@Yukon.ca

References

AMEC Foster-Wheeler. 2017. Mount Nansen Groundwater Quality Existing Conditions Report

Mt. Nansen Remediation Limited Partnership (MNRLP). 2019. Mount Nansen Care and Maintenance; Water License Application QZ19-055.

Government of Yukon, Assessment and Abandoned Mines (AAM). 2017. Mt. Nansen Care and Maintenance Application.

Appendix A: Water Quality Analytical Results

Appendix B: Environmental Isotope Results

Appendix C: Quartz License QZ19-055

Appendix D: July 2021 Photos

Your C.O.C. #: 640722-01-01

Attention: Devon O'Connor

Government of Yukon
Box 2703
Whitehorse, AB
Canada Y1A 2C6

Report Date: 2021/07/30
Report #: R3052836
Version: 2 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C150818
Received: 2021/07/14, 16:30

Sample Matrix: Water
Samples Received: 15

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH	15	N/A	2021/07/19	BBY6SOP-00026	SM 23 2320 B m
Low level chloride/sulphate by AC	15	N/A	2021/07/20	BBY6SOP-00011 / BBY6SOP-00017	SM23-4500-Cl/SO4-E m
Cyanide SAD (strong acid dissociable) (1)	2	N/A	2021/07/20	CAL SOP-00270	SM 23 4500-CN m
Cyanide SAD (strong acid dissociable) (1)	13	N/A	2021/07/21	CAL SOP-00270	SM 23 4500-CN m
Cyanide WAD (weak acid dissociable) (1)	2	N/A	2021/07/20	CAL SOP-00270	SM 23 4500-CN m
Cyanide WAD (weak acid dissociable) (1)	13	N/A	2021/07/21	CAL SOP-00270	SM 23 4500-CN m
Cyanate Calculation	15	N/A	2021/07/30	BBY WI-00033	Auto Calc
Carbon (DOC) (1, 3)	15	N/A	2021/07/23	AB SOP-00087	MMCW 119 1996 m
Conductivity @25C	15	N/A	2021/07/19	BBY6SOP-00026	SM 23 2510 B m
Sulphide (as H2S) (1)	5	N/A	2021/07/20		Auto Calc
Sulphide (as H2S) (1)	10	N/A	2021/07/21		Auto Calc
Hardness Total (calculated as CaCO3) (4)	7	N/A	2021/07/20	BBY WI-00033	Auto Calc
Hardness Total (calculated as CaCO3) (4)	8	N/A	2021/07/21	BBY WI-00033	Auto Calc
Hardness (calculated as CaCO3)	15	N/A	2021/07/20	BBY WI-00033	Auto Calc
Mercury (Dissolved) by CV (5)	5	2021/07/19	2021/07/19	AB SOP-00084	BCMOE BCLM Oct2013 m
Mercury (Dissolved) by CV (5)	10	2021/07/20	2021/07/20	AB SOP-00084	BCMOE BCLM Oct2013 m
Mercury (Total) by CV	3	2021/07/19	2021/07/19	AB SOP-00084	BCMOE BCLM Oct2013 m
Mercury (Total) by CV	2	2021/07/19	2021/07/20	AB SOP-00084	BCMOE BCLM Oct2013 m
Mercury (Total) by CV	10	2021/07/20	2021/07/20	AB SOP-00084	BCMOE BCLM Oct2013 m
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	15	N/A	2021/07/20	BBY WI-00033	Auto Calc
Elements by ICPMS Low Level (dissolved) (5)	15	N/A	2021/07/20	BBY7SOP-00002	EPA 6020b R2 m
Elements by ICPMS Digested LL (total)	8	2021/07/20	2021/07/21	BBY7SOP-00003 / BBY7SOP-00002	EPA 6020b R2 m
Na, K, Ca, Mg, S by CRC ICPMS (total)	7	N/A	2021/07/20	BBY WI-00033	Auto Calc
Na, K, Ca, Mg, S by CRC ICPMS (total)	8	N/A	2021/07/21	BBY WI-00033	Auto Calc
Elements by ICPMS Low Level (total)	7	N/A	2021/07/20	BBY7SOP-00002	EPA 6020b R2 m
Nitrogen (Total)	15	N/A	2021/07/21	BBY6SOP-00016	SM 23 4500-N C m
Un-ionized Ammonia as N @ 15 C	15	N/A	2021/07/21	BBY WI-00033	Auto Calc
Ammonia-N Low Level (Preserved) (1)	15	N/A	2021/07/21	AB SOP-00007	SM 23 4500 NH3 A G m
Nitrate+Nitrite (N) (low level)	15	N/A	2021/07/17	BBY6SOP-00010	SM 23 4500-NO3- I m
Nitrite (N) (low level)	15	N/A	2021/07/17	BBY6SOP-00010	SM 23 4500-NO3- I m

Your C.O.C. #: 640722-01-01

Attention: Devon O'Connor

Government of Yukon
Box 2703
Whitehorse, AB
Canada Y1A 2C6

Report Date: 2021/07/30
Report #: R3052836
Version: 2 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C150818
Received: 2021/07/14, 16:30

Sample Matrix: Water
Samples Received: 15

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Nitrogen - Nitrate (as N) Low Level Calc	15	N/A	2021/07/20	BBY WI-00033	Auto Calc
Filter and HNO3 Preserve for Metals	14	N/A	2021/07/16	BBY7 WI-00004	SM 23 3030B m
pH measured @ 15 C (2, 6)	15	N/A	2021/07/20	EENVSOP-00159	SM 23 4500 H+ B m
pH @25°C (6)	15	N/A	2021/07/19	BBY6SOP-00026	SM 23 4500-H+ B m
Total Sulphide (1)	5	N/A	2021/07/20	AB SOP-00080	SM 23 4500 S2-A D Fm
Total Sulphide (1)	10	N/A	2021/07/21	AB SOP-00080	SM 23 4500 S2-A D Fm
Total Dissolved Solids - Low Level (1)	15	2021/07/20	2021/07/21	AB SOP-00065	SM 23 2540 C m
Total Suspended Solids (NFR)	1	2021/07/19	2021/07/20	BBY6SOP-00034	SM 23 2540 D m
Total Suspended Solids (NFR)	4	2021/07/20	2021/07/21	BBY6SOP-00034	SM 23 2540 D m
Total Suspended Solids (NFR)	10	2021/07/21	2021/07/22	BBY6SOP-00034	SM 23 2540 D m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Bureau Veritas Calgary Environmental
(2) This test was performed by Bureau Veritas Edmonton Environmental

Your C.O.C. #: 640722-01-01

Attention: Devon O'Connor

Government of Yukon
Box 2703
Whitehorse, AB
Canada Y1A 2C6

Report Date: 2021/07/30
Report #: R3052836
Version: 2 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C150818

Received: 2021/07/14, 16:30

(3) DOC present in the sample should be considered as non-purgeable DOC. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(4) "Total Hardness" was calculated from Total Ca and Mg concentrations and may be biased high (Hardness, or Dissolved Hardness, calculated from Dissolved Ca and Mg, should be used for compliance if available).
(5) Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(6) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Bureau Veritas Laboratories endeavours to analyze samples as soon as possible after receipt.

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Customer Solutions, Western Canada Customer Experience Team
Email: customersolutionswest@bureauveritas.com
Phone# (604) 734 7276

==========

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

RESULTS OF CHEMICAL ANALYSES OF WATER

BV Labs ID		ABX350			ABX350			ABX351		
Sampling Date		2021/07/14 09:45			2021/07/14 09:45			2021/07/14 10:20		
COC Number		640722-01-01			640722-01-01			640722-01-01		
	UNITS	PC-U	RDL	QC Batch	PC-U Lab-Dup	RDL	QC Batch	DC-U	RDL	QC Batch
Calculated Parameters										
Filter and HNO3 Preservation	N/A	FIELD		ONSITE				FIELD		ONSITE
Nitrate (N)	mg/L	0.857	0.0020	A289022				0.596	0.0020	A289022
Sulphide (as H2S)	mg/L	<0.0020	0.0020	A288753				0.0059	0.0020	A288753
Un-Ionized Ammonia @ 15 °C	mg/L	0.00069	0.00050	A288748				0.0039	0.00050	A288748
Total Cyanate (CNO-)	mg/L	<0.050	0.050	A306006				<0.050	0.050	A306006
Misc. Inorganics										
Conductivity	uS/cm	800	2.0	A292092				1300	2.0	A292092
Strong Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	0.00050	A292997				0.00336	0.00050	A292997
Weak Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	0.00050	A293007				0.00063	0.00050	A293007
Dissolved Organic Carbon (C)	mg/L	5.7	0.20	A294868				7.9	0.20	A294868
pH	pH	8.08	N/A	A292089				8.22	N/A	A292089
Total Suspended Solids	mg/L	8.8	1.0	A293321				5.2	1.0	A293318
Anions										
Alkalinity (PP as CaCO3)	mg/L	<1.0	1.0	A292091				<1.0	1.0	A292091
Alkalinity (Total as CaCO3)	mg/L	190	1.0	A292091				240	1.0	A292091
Bicarbonate (HCO3)	mg/L	230	1.0	A292091				290	1.0	A292091
Carbonate (CO3)	mg/L	<1.0	1.0	A292091				<1.0	1.0	A292091
Hydroxide (OH)	mg/L	<1.0	1.0	A292091				<1.0	1.0	A292091
Total Sulphide	mg/L	<0.0018	0.0018	A292230				0.0055 (1)	0.0018	A292230
Dissolved Chloride (Cl)	mg/L	0.77	0.50	A291082				0.92	0.50	A291082
Dissolved Sulphate (SO4)	mg/L	250	5.0	A291082				520	5.0	A291082
Nutrients										
Total Ammonia (N)	mg/L	0.031	0.0050	A293243				0.17	0.0050	A293243
Nitrate plus Nitrite (N)	mg/L	0.862	0.0020	A289468				0.603	0.0020	A289468
Nitrite (N)	mg/L	0.0054	0.0020	A289470				0.0066	0.0020	A289470
Total Nitrogen (N)	mg/L	1.08	0.020	A292468	1.10	0.020	A292468	1.09	0.020	A292472
Physical Properties										
pH (15 C)	pH	7.91		A291896				7.93		A291896
Physical Properties										
Total Dissolved Solids	mg/L	578	1.0	A292143				1080	1.0	A292143

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Sample pH <9, preservation incomplete. Due to volatility of analyte, a low bias in the results is likely.

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

RESULTS OF CHEMICAL ANALYSES OF WATER

BV Labs ID		ABX352			ABX352			ABX353		
Sampling Date		2021/07/14 10:45			2021/07/14 10:45			2021/07/14 09:00		
COC Number		640722-01-01			640722-01-01			640722-01-01		
	UNITS	DC-B	RDL	QC Batch	DC-B Lab-Dup	RDL	QC Batch	DC-UVC	RDL	QC Batch
Calculated Parameters										
Filter and HNO3 Preservation	N/A	FIELD		ONSITE				FIELD		ONSITE
Nitrate (N)	mg/L	0.0786	0.0020	A289022				0.112	0.0020	A289022
Sulphide (as H2S)	mg/L	0.0032	0.0020	A288753				0.0022	0.0020	A288753
Un-Ionized Ammonia @ 15 °C	mg/L	0.0015	0.00050	A288748				<0.00050	0.00050	A288748
Total Cyanate (CNO-)	mg/L	<0.050	0.050	A306006				<0.050	0.050	A306006
Misc. Inorganics										
Conductivity	uS/cm	1400	2.0	A292092				1100	2.0	A292092
Strong Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	0.00050	A292997				0.00217	0.00050	A292997
Weak Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	0.00050	A293007				0.00068	0.00050	A293007
Dissolved Organic Carbon (C)	mg/L	5.4	0.20	A294868	5.2	0.20	A294868	11	0.20	A294868
pH	pH	8.23	N/A	A292089				8.19	N/A	A292089
Total Suspended Solids	mg/L	11	1.0	A293318				<1.0	1.0	A293318
Anions										
Alkalinity (PP as CaCO3)	mg/L	<1.0	1.0	A292091				<1.0	1.0	A292091
Alkalinity (Total as CaCO3)	mg/L	240	1.0	A292091				200	1.0	A292091
Bicarbonate (HCO3)	mg/L	290	1.0	A292091				240	1.0	A292091
Carbonate (CO3)	mg/L	<1.0	1.0	A292091				<1.0	1.0	A292091
Hydroxide (OH)	mg/L	<1.0	1.0	A292091				<1.0	1.0	A292091
Total Sulphide	mg/L	0.0030 (1)	0.0018	A292230				0.0020	0.0018	A292230
Dissolved Chloride (Cl)	mg/L	0.66	0.50	A291082				0.58	0.50	A291082
Dissolved Sulphate (SO4)	mg/L	610	5.0	A291082				430	5.0	A291082
Nutrients										
Total Ammonia (N)	mg/L	0.070	0.0050	A293243				0.0052	0.0050	A293243
Nitrate plus Nitrite (N)	mg/L	0.0809	0.0020	A289468				0.112	0.0020	A289468
Nitrite (N)	mg/L	0.0023	0.0020	A289470				<0.0020	0.0020	A289470
Total Nitrogen (N)	mg/L	0.403	0.020	A292472				0.603	0.020	A292472
Physical Properties										
pH (15 C)	pH	7.89		A291896				7.93		A291896
Physical Properties										
Total Dissolved Solids	mg/L	1150	1.0	A292143				900	1.0	A292143

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Sample pH <9, preservation incomplete. Due to volatility of analyte, a low bias in the results is likely.

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

BV Labs Job #: C150818
Report Date: 2021/07/30

Government of Yukon

RESULTS OF CHEMICAL ANALYSES OF WATER

BV Labs ID		ABX354			ABX354			ABX355		
Sampling Date		2021/07/14 09:15			2021/07/14 09:15			2021/07/13 10:50		
COC Number		640722-01-01			640722-01-01			640722-01-01		
	UNITS	DC-R	RDL	QC Batch	DC-R Lab-Dup	RDL	QC Batch	VC-U	RDL	QC Batch
Calculated Parameters										
Filter and HNO3 Preservation	N/A	FIELD		ONSITE				FIELD		ONSITE
Nitrate (N)	mg/L	0.197	0.0020	A289022				0.0588	0.0020	A289022
Sulphide (as H2S)	mg/L	0.021	0.0020	A288753				<0.0020	0.0020	A288753
Un-Ionized Ammonia @ 15 °C	mg/L	<0.00050	0.00050	A288748				<0.00050	0.00050	A288748
Total Cyanate (CNO-)	mg/L	0.14	0.050	A306006				<0.050	0.050	A306006
Misc. Inorganics										
Conductivity	uS/cm	1200	2.0	A292092				200	2.0	A292092
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.00297	0.00050	A292997				0.00101	0.00050	A290697
Weak Acid Dissoc. Cyanide (CN)	mg/L	0.00128	0.00050	A293007				0.00054	0.00050	A290700
Dissolved Organic Carbon (C)	mg/L	9.9	0.20	A294905	11	0.20	A294905	3.7	0.20	A294868
pH	pH	8.11	N/A	A292089				7.79	N/A	A292089
Total Suspended Solids	mg/L	3.2	1.0	A293318				<1.0	1.0	A291824
Anions										
Alkalinity (PP as CaCO3)	mg/L	<1.0	1.0	A292091				<1.0	1.0	A292091
Alkalinity (Total as CaCO3)	mg/L	210	1.0	A292091				89	1.0	A292091
Bicarbonate (HCO3)	mg/L	250	1.0	A292091				110	1.0	A292091
Carbonate (CO3)	mg/L	<1.0	1.0	A292091				<1.0	1.0	A292091
Hydroxide (OH)	mg/L	<1.0	1.0	A292091				<1.0	1.0	A292091
Total Sulphide	mg/L	0.020	0.0018	A292230				<0.0018	0.0018	A291874
Dissolved Chloride (Cl)	mg/L	0.85	0.50	A291082				<0.50	0.50	A291082
Dissolved Sulphate (SO4)	mg/L	490	5.0	A291082				18	0.50	A291082
Nutrients										
Total Ammonia (N)	mg/L	0.022	0.0050	A293243				<0.0050	0.0050	A293243
Nitrate plus Nitrite (N)	mg/L	0.197	0.0020	A289468				0.0588	0.0020	A289468
Nitrite (N)	mg/L	<0.0020	0.0020	A289470				<0.0020	0.0020	A289470
Total Nitrogen (N)	mg/L	0.657	0.020	A292484				0.207	0.020	A292484
Physical Properties										
pH (15 C)	pH	7.53		A291920	7.56		A291920	7.71		A291920
Physical Properties										
Total Dissolved Solids	mg/L	915	1.0	A292143				120	1.0	A292143

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

RESULTS OF CHEMICAL ANALYSES OF WATER

BV Labs ID		ABX356			ABX356			ABX357		
Sampling Date		2021/07/13 11:45			2021/07/13 11:45			2021/07/13 14:30		
COC Number		640722-01-01			640722-01-01			640722-01-01		
	UNITS	VC-REF	RDL	QC Batch	VC-REF Lab-Dup	RDL	QC Batch	VC-R	RDL	QC Batch
Calculated Parameters										
Filter and HNO3 Preservation	N/A	FIELD		ONSITE				FIELD		ONSITE
Nitrate (N)	mg/L	0.0610	0.0020	A289022				0.0481	0.0020	A289022
Sulphide (as H2S)	mg/L	<0.0020	0.0020	A288753				<0.0020	0.0020	A288753
Un-Ionized Ammonia @ 15 °C	mg/L	<0.00050	0.00050	A288748				<0.00050	0.00050	A288748
Total Cyanate (CNO-)	mg/L	<0.050	0.050	A306006				<0.050	0.050	A306006
Misc. Inorganics										
Conductivity	uS/cm	200	2.0	A292092				240	2.0	A292092
Strong Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	0.00050	A292997	<0.00050	0.00050	A292997	<0.00050	0.00050	A292997
Weak Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	0.00050	A293007	<0.00050	0.00050	A293007	<0.00050	0.00050	A293007
Dissolved Organic Carbon (C)	mg/L	3.8	0.20	A294868				5.2	0.20	A294868
pH	pH	7.71	N/A	A292089				7.73	N/A	A292089
Total Suspended Solids	mg/L	<1.0	1.0	A291841				<1.0	1.0	A291841
Anions										
Alkalinity (PP as CaCO3)	mg/L	<1.0	1.0	A292091				<1.0	1.0	A292091
Alkalinity (Total as CaCO3)	mg/L	89	1.0	A292091				89	1.0	A292091
Bicarbonate (HCO3)	mg/L	110	1.0	A292091				110	1.0	A292091
Carbonate (CO3)	mg/L	<1.0	1.0	A292091				<1.0	1.0	A292091
Hydroxide (OH)	mg/L	<1.0	1.0	A292091				<1.0	1.0	A292091
Total Sulphide	mg/L	<0.0018	0.0018	A291874				<0.0018	0.0018	A291874
Dissolved Chloride (Cl)	mg/L	<0.50	0.50	A291083				<0.50	0.50	A291083
Dissolved Sulphate (SO4)	mg/L	18	0.50	A291083				38	0.50	A291083
Nutrients										
Total Ammonia (N)	mg/L	<0.0050	0.0050	A293243				0.013	0.0050	A293243
Nitrate plus Nitrite (N)	mg/L	0.0610	0.0020	A289468				0.0481	0.0020	A289468
Nitrite (N)	mg/L	<0.0020	0.0020	A289470				<0.0020	0.0020	A289470
Total Nitrogen (N)	mg/L	0.198	0.020	A292484				0.213	0.020	A292484
Physical Properties										
pH (15 C)	pH	7.75		A291920				7.80		A291920
Physical Properties										
Total Dissolved Solids	mg/L	119	1.0	A292143				147	1.0	A292143

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

RESULTS OF CHEMICAL ANALYSES OF WATER

BV Labs ID		ABX357			ABX358		ABX359		
Sampling Date		2021/07/13 14:30			2021/07/12 15:25		2021/07/13 10:20		
COC Number		640722-01-01			640722-01-01		640722-01-01		
	UNITS	VC-R Lab-Dup	RDL	QC Batch	VC-BG	QC Batch	BC	RDL	QC Batch
Calculated Parameters									
Filter and HNO3 Preservation	N/A				FIELD	ONSITE	FIELD		ONSITE
Nitrate (N)	mg/L				0.0284	A289022	0.0847	0.0020	A289022
Sulphide (as H2S)	mg/L				<0.0020	A288753	<0.0020	0.0020	A288753
Un-Ionized Ammonia @ 15 °C	mg/L				<0.00050	A288748	<0.00050	0.00050	A288748
Total Cyanate (CNO-)	mg/L				<0.050	A306006	<0.050	0.050	A306006
Misc. Inorganics									
Conductivity	uS/cm	240	2.0	A292092	230	A292092	370	2.0	A292092
Strong Acid Dissoc. Cyanide (CN)	mg/L				<0.00050	A292997	<0.00050	0.00050	A292997
Weak Acid Dissoc. Cyanide (CN)	mg/L				0.00056	A293007	<0.00050	0.00050	A293007
Dissolved Organic Carbon (C)	mg/L				4.7	A294868	5.7	0.20	A294868
pH	pH	7.71	N/A	A292089	7.89	A292089	7.97	N/A	A292089
Total Suspended Solids	mg/L				2.0	A290755	2.0	1.0	A291841
Anions									
Alkalinity (PP as CaCO3)	mg/L	<1.0	1.0	A292091	<1.0	A292091	<1.0	1.0	A292091
Alkalinity (Total as CaCO3)	mg/L	87	1.0	A292091	110	A292091	120	1.0	A292091
Bicarbonate (HCO3)	mg/L	110	1.0	A292091	130	A292091	150	1.0	A292091
Carbonate (CO3)	mg/L	<1.0	1.0	A292091	<1.0	A292091	<1.0	1.0	A292091
Hydroxide (OH)	mg/L	<1.0	1.0	A292091	<1.0	A292091	<1.0	1.0	A292091
Total Sulphide	mg/L				<0.0018	A291874	<0.0018	0.0018	A291874
Dissolved Chloride (Cl)	mg/L	<0.50	0.50	A291083	<0.50	A291083	0.56	0.50	A291083
Dissolved Sulphate (SO4)	mg/L	39	0.50	A291083	18	A291083	75	0.50	A291083
Nutrients									
Total Ammonia (N)	mg/L				<0.0050	A293243	0.0056	0.0050	A293243
Nitrate plus Nitrite (N)	mg/L				0.0284	A289468	0.0847	0.0020	A289468
Nitrite (N)	mg/L				<0.0020	A289470	<0.0020	0.0020	A289470
Total Nitrogen (N)	mg/L				0.199	A292484	0.294	0.020	A292484
Physical Properties									
pH (15 C)	pH				7.88	A291920	7.74		A291920
Physical Properties									
Total Dissolved Solids	mg/L				136	A292143	238	1.0	A292143

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

BV Labs Job #: C150818
Report Date: 2021/07/30

Government of Yukon

RESULTS OF CHEMICAL ANALYSES OF WATER

BV Labs ID		ABX585			ABX585			ABX586		
Sampling Date		2021/07/14 09:45			2021/07/14 09:45			2021/07/14 09:45		
COC Number		640722-01-01			640722-01-01			640722-01-01		
	UNITS	BC-R	RDL	QC Batch	BC-R Lab-Dup	RDL	QC Batch	MN	RDL	QC Batch
Calculated Parameters										
Filter and HNO3 Preservation	N/A	FIELD		ONSITE				FIELD		ONSITE
Nitrate (N)	mg/L	0.0834	0.0020	A289022				0.0227	0.0020	A289022
Sulphide (as H2S)	mg/L	0.0027	0.0020	A288753				0.0038	0.0020	A288753
Un-Ionized Ammonia @ 15 °C	mg/L	<0.00050	0.00050	A288748				<0.00050	0.00050	A288748
Total Cyanate (CNO-)	mg/L	<0.050	0.050	A306006				0.099	0.050	A306006
Misc. Inorganics										
Conductivity	uS/cm	360	2.0	A292085	360	2.0	A292085	97	2.0	A292085
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.00060	0.00050	A293012				0.00079	0.00050	A293012
Weak Acid Dissoc. Cyanide (CN)	mg/L	0.00054	0.00050	A293013				<0.00050	0.00050	A293013
Dissolved Organic Carbon (C)	mg/L	5.5	0.20	A294868				17	0.20	A294868
pH	pH	7.85	N/A	A292082	7.95	N/A	A292082	7.22	N/A	A292082
Total Suspended Solids	mg/L	1.2	1.0	A293321				2.4	1.0	A293318
Anions										
Alkalinity (PP as CaCO3)	mg/L	<1.0	1.0	A292084	<1.0	1.0	A292084	<1.0	1.0	A292084
Alkalinity (Total as CaCO3)	mg/L	120	1.0	A292084	120	1.0	A292084	44	1.0	A292084
Bicarbonate (HCO3)	mg/L	150	1.0	A292084	150	1.0	A292084	54	1.0	A292084
Carbonate (CO3)	mg/L	<1.0	1.0	A292084	<1.0	1.0	A292084	<1.0	1.0	A292084
Hydroxide (OH)	mg/L	<1.0	1.0	A292084	<1.0	1.0	A292084	<1.0	1.0	A292084
Total Sulphide	mg/L	0.0025	0.0018	A292230				0.0035	0.0018	A292230
Dissolved Chloride (Cl)	mg/L	0.55	0.50	A291082	0.61	0.50	A291082	0.76	0.50	A291082
Dissolved Sulphate (SO4)	mg/L	77	0.50	A291082	74	0.50	A291082	2.9	0.50	A291082
Nutrients										
Total Ammonia (N)	mg/L	0.0081	0.0050	A293243				0.024	0.0050	A293243
Nitrate plus Nitrite (N)	mg/L	0.0834	0.0020	A289468	0.0852	0.0020	A289468	0.0227	0.0020	A289468
Nitrite (N)	mg/L	<0.0020	0.0020	A289470	<0.0020	0.0020	A289470	<0.0020	0.0020	A289470
Total Nitrogen (N)	mg/L	0.308	0.020	A292484				0.487	0.020	A292484
Physical Properties										
pH (15 C)	pH	7.75		A291920				7.52		A291920
Physical Properties										
Total Dissolved Solids	mg/L	235	1.0	A292143				97.2	1.0	A292143

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

RESULTS OF CHEMICAL ANALYSES OF WATER

BV Labs ID		ABX586			ABX587			ABX588		
Sampling Date		2021/07/14 09:45			2021/07/14 09:45			2021/07/14 09:45		
COC Number		640722-01-01			640722-01-01			640722-01-01		
	UNITS	MN Lab-Dup	RDL	QC Batch	MS BACK	RDL	QC Batch	FIELD BLANK	RDL	QC Batch
Calculated Parameters										
Filter and HNO3 Preservation	N/A				FIELD		ONSITE	FIELD		ONSITE
Nitrate (N)	mg/L				0.0131	0.0020	A289022	<0.0020	0.0020	A289022
Sulphide (as H2S)	mg/L				<0.0020	0.0020	A288753	<0.0020	0.0020	A288753
Un-Ionized Ammonia @ 15 °C	mg/L				<0.00050	0.00050	A288748	<0.00050	0.00050	A288748
Total Cyanate (CNO-)	mg/L				<0.050	0.050	A306006	<0.050	0.050	A306006
Misc. Inorganics										
Conductivity	uS/cm				2300	2.0	A292092	<2.0	2.0	A292092
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.00079	0.00050	A293012	<0.00050	0.00050	A293012	<0.00050	0.00050	A290697
Weak Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	0.00050	A293013	<0.00050	0.00050	A293013	0.00054	0.00050	A290700
Dissolved Organic Carbon (C)	mg/L				2.7	0.20	A294868	<0.20	0.20	A294868
pH	pH				7.88	N/A	A292089	6.75	N/A	A292089
Total Suspended Solids	mg/L				7.2	1.0	A293318	<1.0	1.0	A293321
Anions										
Alkalinity (PP as CaCO3)	mg/L				<1.0	1.0	A292091	<1.0	1.0	A292091
Alkalinity (Total as CaCO3)	mg/L				450	1.0	A292091	1.8	1.0	A292091
Bicarbonate (HCO3)	mg/L				550	1.0	A292091	2.2	1.0	A292091
Carbonate (CO3)	mg/L				<1.0	1.0	A292091	<1.0	1.0	A292091
Hydroxide (OH)	mg/L				<1.0	1.0	A292091	<1.0	1.0	A292091
Total Sulphide	mg/L				<0.0018 (1)	0.0018	A292230	<0.0018	0.0018	A292230
Dissolved Chloride (Cl)	mg/L				<0.50	0.50	A291082	<0.50	0.50	A291082
Dissolved Sulphate (SO4)	mg/L				1100	5.0	A291082	<0.50	0.50	A291082
Nutrients										
Total Ammonia (N)	mg/L				<0.0050	0.0050	A293243	<0.0050	0.0050	A293243
Nitrate plus Nitrite (N)	mg/L				0.0131	0.0020	A289468	<0.0020	0.0020	A289468
Nitrite (N)	mg/L				<0.0020	0.0020	A289470	<0.0020	0.0020	A289470
Total Nitrogen (N)	mg/L				0.116	0.020	A292484	0.026	0.020	A292468
Physical Properties										
pH (15 C)	pH				7.12		A291920	6.67		A291920
Physical Properties										
Total Dissolved Solids	mg/L				2050	1.0	A292143	<1.0	1.0	A292143

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Sample pH <9, preservation incomplete. Due to volatility of analyte, a low bias in the results is likely.

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

RESULTS OF CHEMICAL ANALYSES OF WATER

BV Labs ID		ABX588			ABX589			ABX589		
Sampling Date		2021/07/14 09:45			2021/07/14 09:45			2021/07/14 09:45		
COC Number		640722-01-01			640722-01-01			640722-01-01		
	UNITS	FIELD BLANK Lab-Dup	RDL	QC Batch	TRIP BLANK	RDL	QC Batch	TRIP BLANK Lab-Dup	RDL	QC Batch
Calculated Parameters										
Nitrate (N)	mg/L				<0.0020	0.0020	A289022			
Sulphide (as H2S)	mg/L				<0.0020	0.0020	A288753			
Un-Ionized Ammonia @ 15 °C	mg/L				<0.00050	0.00050	A288748			
Total Cyanate (CNO-)	mg/L				<0.050	0.050	A306006			
Misc. Inorganics										
Conductivity	uS/cm				<2.0	2.0	A292092			
Strong Acid Dissoc. Cyanide (CN)	mg/L				<0.00050	0.00050	A292997			
Weak Acid Dissoc. Cyanide (CN)	mg/L				<0.00050	0.00050	A293007			
Dissolved Organic Carbon (C)	mg/L				<0.20	0.20	A294868			
pH	pH				5.78	N/A	A292089			
Total Suspended Solids	mg/L	<1.0	1.0	A293321	<1.0	1.0	A293321			
Anions										
Alkalinity (PP as CaCO3)	mg/L				<1.0	1.0	A292091			
Alkalinity (Total as CaCO3)	mg/L				<1.0	1.0	A292091			
Bicarbonate (HCO3)	mg/L				<1.0	1.0	A292091			
Carbonate (CO3)	mg/L				<1.0	1.0	A292091			
Hydroxide (OH)	mg/L				<1.0	1.0	A292091			
Total Sulphide	mg/L				<0.0018	0.0018	A292230			
Dissolved Chloride (Cl)	mg/L				<0.50	0.50	A291082			
Dissolved Sulphate (SO4)	mg/L				<0.50	0.50	A291082			
Nutrients										
Total Ammonia (N)	mg/L	<0.0050	0.0050	A293243	<0.0050	0.0050	A293247	<0.0050	0.0050	A293247
Nitrate plus Nitrite (N)	mg/L				<0.0020	0.0020	A289468			
Nitrite (N)	mg/L				<0.0020	0.0020	A289470			
Total Nitrogen (N)	mg/L				0.031	0.020	A292468			
Physical Properties										
pH (15 C)	pH				6.25		A291920			
Physical Properties										
Total Dissolved Solids	mg/L				<1.0	1.0	A292143			

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

BV Labs ID		ABX350			ABX350			ABX351		
Sampling Date		2021/07/14 09:45			2021/07/14 09:45			2021/07/14 10:20		
COC Number		640722-01-01			640722-01-01			640722-01-01		
	UNITS	PC-U	RDL	QC Batch	PC-U Lab-Dup	RDL	QC Batch	DC-U	RDL	QC Batch
Calculated Parameters										
Dissolved Hardness (CaCO3)	mg/L	410	0.50	A288355				746	0.50	A288355
Elements										
Dissolved Mercury (Hg)	ug/L	<0.0019	0.0019	A292164				<0.0019	0.0019	A292164
Dissolved Metals by ICPMS										
Dissolved Aluminum (Al)	ug/L	5.30	0.50	A290604	5.30	0.50	A290604	6.89	0.50	A290604
Dissolved Antimony (Sb)	ug/L	1.45	0.020	A290604	1.47	0.020	A290604	1.51	0.020	A290604
Dissolved Arsenic (As)	ug/L	3.86	0.020	A290604	3.88	0.020	A290604	10.6	0.020	A290604
Dissolved Barium (Ba)	ug/L	40.3	0.020	A290604	40.3	0.020	A290604	43.9	0.020	A290604
Dissolved Beryllium (Be)	ug/L	<0.010	0.010	A290604	<0.010	0.010	A290604	<0.010	0.010	A290604
Dissolved Bismuth (Bi)	ug/L	<0.0050	0.0050	A290604	<0.0050	0.0050	A290604	<0.0050	0.0050	A290604
Dissolved Boron (B)	ug/L	<10	10	A290604	<10	10	A290604	21	10	A290604
Dissolved Cadmium (Cd)	ug/L	0.627	0.0050	A290604	0.627	0.0050	A290604	0.0289	0.0050	A290604
Dissolved Chromium (Cr)	ug/L	<0.10	0.10	A290604	<0.10	0.10	A290604	0.13	0.10	A290604
Dissolved Cobalt (Co)	ug/L	0.275	0.0050	A290604	0.282	0.0050	A290604	1.03	0.0050	A290604
Dissolved Copper (Cu)	ug/L	1.90	0.050	A290604	1.90	0.050	A290604	0.624	0.050	A290604
Dissolved Iron (Fe)	ug/L	24.0	1.0	A290604	23.3	1.0	A290604	250	1.0	A290604
Dissolved Lead (Pb)	ug/L	0.0831	0.0050	A290604	0.0891	0.0050	A290604	0.0062	0.0050	A290604
Dissolved Lithium (Li)	ug/L	2.58	0.50	A290604	2.61	0.50	A290604	3.95	0.50	A290604
Dissolved Manganese (Mn)	ug/L	375	0.050	A290604	374	0.050	A290604	926	0.050	A290604
Dissolved Molybdenum (Mo)	ug/L	0.338	0.050	A290604	0.346	0.050	A290604	0.410	0.050	A290604
Dissolved Nickel (Ni)	ug/L	0.581	0.020	A290604	0.584	0.020	A290604	0.843	0.020	A290604
Dissolved Phosphorus (P)	ug/L	3.1	2.0	A290604	2.5	2.0	A290604	6.3	2.0	A290604
Dissolved Selenium (Se)	ug/L	0.064	0.040	A290604	0.057	0.040	A290604	0.105	0.040	A290604
Dissolved Silicon (Si)	ug/L	5110	50	A290604	5100	50	A290604	5330	50	A290604
Dissolved Silver (Ag)	ug/L	<0.0050	0.0050	A290604	<0.0050	0.0050	A290604	<0.0050	0.0050	A290604
Dissolved Strontium (Sr)	ug/L	703	0.050	A290604	704	0.050	A290604	656	0.050	A290604
Dissolved Thallium (Tl)	ug/L	0.0115	0.0020	A290604	0.0102	0.0020	A290604	0.0043	0.0020	A290604
Dissolved Tin (Sn)	ug/L	<0.20	0.20	A290604	<0.20	0.20	A290604	<0.20	0.20	A290604
Dissolved Titanium (Ti)	ug/L	<0.50	0.50	A290604	<0.50	0.50	A290604	<0.50	0.50	A290604
Dissolved Uranium (U)	ug/L	3.53	0.0020	A290604	3.57	0.0020	A290604	2.43	0.0020	A290604
Dissolved Vanadium (V)	ug/L	<0.20	0.20	A290604	<0.20	0.20	A290604	0.23	0.20	A290604
Dissolved Zinc (Zn)	ug/L	57.9	0.10	A290604	57.4	0.10	A290604	13.9	0.10	A290604

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

BV Labs ID		ABX350			ABX350			ABX351		
Sampling Date		2021/07/14 09:45			2021/07/14 09:45			2021/07/14 10:20		
COC Number		640722-01-01			640722-01-01			640722-01-01		
	UNITS	PC-U	RDL	QC Batch	PC-U Lab-Dup	RDL	QC Batch	DC-U	RDL	QC Batch
Dissolved Zirconium (Zr)	ug/L	<0.10	0.10	A290604	<0.10	0.10	A290604	0.14	0.10	A290604
Dissolved Calcium (Ca)	mg/L	120	0.050	A288626				180	0.050	A288626
Dissolved Magnesium (Mg)	mg/L	26.7	0.050	A288626				71.8	0.050	A288626
Dissolved Potassium (K)	mg/L	1.52	0.050	A288626				3.26	0.050	A288626
Dissolved Sodium (Na)	mg/L	7.08	0.050	A288626				11.6	0.050	A288626
Dissolved Sulphur (S)	mg/L	83.6	3.0	A288626				185	3.0	A288626

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

BV Labs ID		ABX352	ABX353	ABX354	ABX355	ABX356	ABX357		
Sampling Date		2021/07/14 10:45	2021/07/14 09:00	2021/07/14 09:15	2021/07/13 10:50	2021/07/13 11:45	2021/07/13 14:30		
COC Number		640722-01-01	640722-01-01	640722-01-01	640722-01-01	640722-01-01	640722-01-01		
	UNITS	DC-B	DC-UVC	DC-R	VC-U	VC-REF	VC-R	RDL	QC Batch
Calculated Parameters									
Dissolved Hardness (CaCO3)	mg/L	791	619	640	91.5	91.3	109	0.50	A288355
Elements									
Dissolved Mercury (Hg)	ug/L	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	0.0019	A292164
Dissolved Metals by ICPMS									
Dissolved Aluminum (Al)	ug/L	7.15	5.02	6.24	10.4	10.7	13.6	0.50	A290604
Dissolved Antimony (Sb)	ug/L	2.28	1.14	1.42	0.081	0.103	0.236	0.020	A290604
Dissolved Arsenic (As)	ug/L	4.23	6.80	7.01	0.275	0.280	1.12	0.020	A290604
Dissolved Barium (Ba)	ug/L	42.9	29.4	34.0	59.7	57.9	59.5	0.020	A290604
Dissolved Beryllium (Be)	ug/L	<0.010	<0.010	<0.010	<0.010	<0.010	<0.010	0.010	A290604
Dissolved Bismuth (Bi)	ug/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	A290604
Dissolved Boron (B)	ug/L	13	14	16	<10	<10	<10	10	A290604
Dissolved Cadmium (Cd)	ug/L	0.0211	0.0095	0.0158	0.0134	0.0130	0.0153	0.0050	A290604
Dissolved Chromium (Cr)	ug/L	<0.10	0.14	0.14	<0.10	<0.10	<0.10	0.10	A290604
Dissolved Cobalt (Co)	ug/L	0.343	0.597	0.667	0.0352	0.0357	0.0748	0.0050	A290604
Dissolved Copper (Cu)	ug/L	0.404	0.820	1.00	1.06	1.00	1.17	0.050	A290604
Dissolved Iron (Fe)	ug/L	24.7	44.7	378	25.5	24.8	89.6	1.0	A290604
Dissolved Lead (Pb)	ug/L	<0.0050	0.0065	0.0109	<0.0050	<0.0050	0.0077	0.0050	A290604
Dissolved Lithium (Li)	ug/L	5.49	2.41	2.73	0.65	0.70	0.75	0.50	A290604
Dissolved Manganese (Mn)	ug/L	460	38.1	88.2	32.6	17.2	30.2	0.050	A290604
Dissolved Molybdenum (Mo)	ug/L	0.337	0.311	0.342	0.413	0.431	0.398	0.050	A290604
Dissolved Nickel (Ni)	ug/L	0.679	0.640	0.744	0.258	0.254	0.405	0.020	A290604
Dissolved Phosphorus (P)	ug/L	3.0	4.6	4.4	<2.0	<2.0	2.2	2.0	A290604
Dissolved Selenium (Se)	ug/L	0.085	0.076	0.086	0.041	0.042	0.048	0.040	A290604
Dissolved Silicon (Si)	ug/L	5380	5140	5270	5060	5000	5090	50	A290604
Dissolved Silver (Ag)	ug/L	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	<0.0050	0.0050	A290604
Dissolved Strontium (Sr)	ug/L	660	516	548	269	274	260	0.050	A290604
Dissolved Thallium (Tl)	ug/L	0.0043	0.0022	0.0022	<0.0020	<0.0020	<0.0020	0.0020	A290604
Dissolved Tin (Sn)	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	A290604
Dissolved Titanium (Ti)	ug/L	<0.50	<0.50	<0.50	<0.50	<0.50	<0.50	0.50	A290604
Dissolved Uranium (U)	ug/L	3.05	1.82	2.02	0.567	0.599	0.587	0.0020	A290604
Dissolved Vanadium (V)	ug/L	0.22	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	A290604
Dissolved Zinc (Zn)	ug/L	24.5	0.92	2.70	0.82	0.40	0.56	0.10	A290604
Dissolved Zirconium (Zr)	ug/L	<0.10	0.14	0.16	<0.10	<0.10	0.13	0.10	A290604

RDL = Reportable Detection Limit

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

BV Labs ID		ABX352	ABX353	ABX354	ABX355	ABX356	ABX357		
Sampling Date		2021/07/14 10:45	2021/07/14 09:00	2021/07/14 09:15	2021/07/13 10:50	2021/07/13 11:45	2021/07/13 14:30		
COC Number		640722-01-01	640722-01-01	640722-01-01	640722-01-01	640722-01-01	640722-01-01		
	UNITS	**DC-B**	**DC-UVC**	**DC-R**	**VC-U**	**VC-REF**	**VC-R**	**RDL**	**QC Batch**
Dissolved Calcium (Ca)	mg/L	180	149	155	22.8	22.6	26.8	0.050	A288626
Dissolved Magnesium (Mg)	mg/L	82.9	60.2	61.3	8.40	8.49	10.1	0.050	A288626
Dissolved Potassium (K)	mg/L	2.90	2.85	2.98	0.615	0.599	0.760	0.050	A288626
Dissolved Sodium (Na)	mg/L	7.86	11.1	11.3	2.42	2.41	2.89	0.050	A288626
Dissolved Sulphur (S)	mg/L	198	151	153	4.7	5.4	11.3	3.0	A288626
RDL = Reportable Detection Limit									

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

BV Labs ID		ABX358	ABX359		ABX585	ABX586		ABX587		
Sampling Date		2021/07/12 15:25	2021/07/13 10:20		2021/07/14 09:45	2021/07/14 09:45		2021/07/14 09:45		
COC Number		640722-01-01	640722-01-01		640722-01-01	640722-01-01		640722-01-01		
	UNITS	VC-BG	BC	QC Batch	BC-R	MN	RDL	MS BACK	RDL	QC Batch
Calculated Parameters										
Dissolved Hardness (CaCO3)	mg/L	109	172	A288355	174	45.5	0.50	1510	0.50	A288355
Elements										
Dissolved Mercury (Hg)	ug/L	<0.0019	<0.0019	A292164	<0.0019	0.0031	0.0019	<0.0019	0.0019	A290523
Dissolved Metals by ICPMS										
Dissolved Aluminum (Al)	ug/L	9.24	6.21	A290604	6.23	70.4	0.50	2.0	1.0	A290604
Dissolved Antimony (Sb)	ug/L	0.047	0.243	A290604	0.248	0.110	0.020	0.423	0.040	A290604
Dissolved Arsenic (As)	ug/L	0.235	2.85	A290604	2.88	1.72	0.020	49.1	0.040	A290604
Dissolved Barium (Ba)	ug/L	74.8	45.2	A290604	45.8	64.0	0.020	11.9	0.040	A290604
Dissolved Beryllium (Be)	ug/L	<0.010	<0.010	A290604	<0.010	0.021	0.010	<0.020	0.020	A290604
Dissolved Bismuth (Bi)	ug/L	<0.0050	<0.0050	A290604	<0.0050	<0.0050	0.0050	<0.010	0.010	A290604
Dissolved Boron (B)	ug/L	<10	<10	A290604	<10	<10	10	<20	20	A290604
Dissolved Cadmium (Cd)	ug/L	<0.0050	0.0672	A290604	0.0671	0.0193	0.0050	0.092	0.010	A290604
Dissolved Chromium (Cr)	ug/L	<0.10	<0.10	A290604	<0.10	0.39	0.10	<0.20	0.20	A290604
Dissolved Cobalt (Co)	ug/L	0.0206	0.251	A290604	0.246	0.518	0.0050	0.261	0.010	A290604
Dissolved Copper (Cu)	ug/L	0.622	1.14	A290604	1.12	1.78	0.050	0.80	0.10	A290604
Dissolved Iron (Fe)	ug/L	44.3	139	A290604	138	1140	1.0	22.7	2.0	A290604
Dissolved Lead (Pb)	ug/L	<0.0050	0.0163	A290604	0.0191	0.0186	0.0050	0.012	0.010	A290604
Dissolved Lithium (Li)	ug/L	1.67	1.39	A290604	1.39	1.20	0.50	16.8	1.0	A290604
Dissolved Manganese (Mn)	ug/L	4.30	486	A290604	485	139	0.050	330	0.10	A290604
Dissolved Molybdenum (Mo)	ug/L	0.261	0.965	A290604	0.978	0.264	0.050	<0.10	0.10	A290604
Dissolved Nickel (Ni)	ug/L	0.298	0.652	A290604	0.666	1.94	0.020	0.522	0.040	A290604
Dissolved Phosphorus (P)	ug/L	<2.0	3.6	A290604	3.0	7.2	2.0	<4.0	4.0	A290604
Dissolved Selenium (Se)	ug/L	<0.040	0.041	A290604	0.042	0.094	0.040	0.137	0.080	A290604
Dissolved Silicon (Si)	ug/L	5380	5890	A290604	5980	6850	50	5680	100	A290604
Dissolved Silver (Ag)	ug/L	<0.0050	<0.0050	A290604	<0.0050	<0.0050	0.0050	<0.010	0.010	A290604
Dissolved Strontium (Sr)	ug/L	337	335	A290604	341	73.0	0.050	797	0.10	A290604
Dissolved Thallium (Tl)	ug/L	<0.0020	<0.0020	A290604	<0.0020	0.0026	0.0020	0.229	0.0040	A290604
Dissolved Tin (Sn)	ug/L	<0.20	<0.20	A290604	<0.20	<0.20	0.20	<0.40	0.40	A290604
Dissolved Titanium (Ti)	ug/L	<0.50	<0.50	A290604	<0.50	0.98	0.50	<1.0	1.0	A290604
Dissolved Uranium (U)	ug/L	0.933	2.21	A290604	2.24	0.190	0.0020	7.18	0.0040	A290604
Dissolved Vanadium (V)	ug/L	0.21	0.22	A290604	0.22	0.74	0.20	<0.40	0.40	A290604
Dissolved Zinc (Zn)	ug/L	0.70	0.90	A290604	1.10	1.21	0.10	6.79	0.20	A290604
Dissolved Zirconium (Zr)	ug/L	<0.10	0.10	A290604	0.11	0.57	0.10	<0.20	0.20	A290604

RDL = Reportable Detection Limit

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

BV Labs ID		ABX358	ABX359		ABX585	ABX586		ABX587		
Sampling Date		2021/07/12 15:25	2021/07/13 10:20		2021/07/14 09:45	2021/07/14 09:45		2021/07/14 09:45		
COC Number		640722-01-01	640722-01-01		640722-01-01	640722-01-01		640722-01-01		
	UNITS	VC-BG	BC	QC Batch	BC-R	MN	RDL	MS BACK	RDL	QC Batch
Dissolved Calcium (Ca)	mg/L	24.8	47.1	A288626	48.3	11.7	0.050	323	0.10	A288626
Dissolved Magnesium (Mg)	mg/L	11.3	13.2	A288626	12.9	3.93	0.050	170	0.10	A288626
Dissolved Potassium (K)	mg/L	0.726	0.981	A288626	0.951	0.759	0.050	5.86	0.10	A288626
Dissolved Sodium (Na)	mg/L	2.59	4.01	A288626	3.85	2.04	0.050	7.88	0.10	A288626
Dissolved Sulphur (S)	mg/L	4.9	22.8	A288626	21.6	<3.0	3.0	366	6.0	A288626
RDL = Reportable Detection Limit										

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

BV Labs ID		ABX588			ABX588			ABX589		
Sampling Date		2021/07/14 09:45			2021/07/14 09:45			2021/07/14 09:45		
COC Number		640722-01-01			640722-01-01			640722-01-01		
	UNITS	FIELD BLANK	RDL	QC Batch	FIELD BLANK Lab-Dup	RDL	QC Batch	TRIP BLANK	RDL	QC Batch
Calculated Parameters										
Dissolved Hardness (CaCO3)	mg/L	<0.50	0.50	A288355				<0.50	0.50	A288355
Elements										
Dissolved Mercury (Hg)	ug/L	<0.0019	0.0019	A290523				<0.0019	0.0019	A290523
Dissolved Metals by ICPMS										
Dissolved Aluminum (Al)	ug/L	1.18	0.50	A290604	1.33	0.50	A290604	<0.50	0.50	A290604
Dissolved Antimony (Sb)	ug/L	<0.020	0.020	A290604	<0.020	0.020	A290604	<0.020	0.020	A290604
Dissolved Arsenic (As)	ug/L	<0.020	0.020	A290604	<0.020	0.020	A290604	<0.020	0.020	A290604
Dissolved Barium (Ba)	ug/L	<0.020	0.020	A290604	<0.020	0.020	A290604	<0.020	0.020	A290604
Dissolved Beryllium (Be)	ug/L	<0.010	0.010	A290604	<0.010	0.010	A290604	<0.010	0.010	A290604
Dissolved Bismuth (Bi)	ug/L	<0.0050	0.0050	A290604	<0.0050	0.0050	A290604	<0.0050	0.0050	A290604
Dissolved Boron (B)	ug/L	<10	10	A290604	<10	10	A290604	<10	10	A290604
Dissolved Cadmium (Cd)	ug/L	<0.0050	0.0050	A290604	<0.0050	0.0050	A290604	<0.0050	0.0050	A290604
Dissolved Chromium (Cr)	ug/L	<0.10	0.10	A290604	<0.10	0.10	A290604	<0.10	0.10	A290604
Dissolved Cobalt (Co)	ug/L	<0.0050	0.0050	A290604	<0.0050	0.0050	A290604	<0.0050	0.0050	A290604
Dissolved Copper (Cu)	ug/L	<0.050	0.050	A290604	<0.050	0.050	A290604	<0.050	0.050	A290604
Dissolved Iron (Fe)	ug/L	<1.0	1.0	A290604	<1.0	1.0	A290604	<1.0	1.0	A290604
Dissolved Lead (Pb)	ug/L	<0.0050	0.0050	A290604	<0.0050	0.0050	A290604	<0.0050	0.0050	A290604
Dissolved Lithium (Li)	ug/L	<0.50	0.50	A290604	<0.50	0.50	A290604	<0.50	0.50	A290604
Dissolved Manganese (Mn)	ug/L	<0.050	0.050	A290604	<0.050	0.050	A290604	<0.050	0.050	A290604
Dissolved Molybdenum (Mo)	ug/L	<0.050	0.050	A290604	<0.050	0.050	A290604	<0.050	0.050	A290604
Dissolved Nickel (Ni)	ug/L	<0.020	0.020	A290604	<0.020	0.020	A290604	<0.020	0.020	A290604
Dissolved Phosphorus (P)	ug/L	<2.0	2.0	A290604	<2.0	2.0	A290604	<2.0	2.0	A290604
Dissolved Selenium (Se)	ug/L	<0.040	0.040	A290604	<0.040	0.040	A290604	<0.040	0.040	A290604
Dissolved Silicon (Si)	ug/L	<50	50	A290604	<50	50	A290604	<50	50	A290604
Dissolved Silver (Ag)	ug/L	<0.0050	0.0050	A290604	<0.0050	0.0050	A290604	<0.0050	0.0050	A290604
Dissolved Strontium (Sr)	ug/L	<0.050	0.050	A290604	<0.050	0.050	A290604	<0.050	0.050	A290604
Dissolved Thallium (Tl)	ug/L	<0.0020	0.0020	A290604	<0.0020	0.0020	A290604	<0.0020	0.0020	A290604
Dissolved Tin (Sn)	ug/L	<0.20	0.20	A290604	<0.20	0.20	A290604	<0.20	0.20	A290604
Dissolved Titanium (Ti)	ug/L	<0.50	0.50	A290604	<0.50	0.50	A290604	<0.50	0.50	A290604
Dissolved Uranium (U)	ug/L	<0.0020	0.0020	A290604	<0.0020	0.0020	A290604	<0.0020	0.0020	A290604
Dissolved Vanadium (V)	ug/L	<0.20	0.20	A290604	<0.20	0.20	A290604	<0.20	0.20	A290604
Dissolved Zinc (Zn)	ug/L	<0.10	0.10	A290604	0.19	0.10	A290604	<0.10	0.10	A290604

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

BV Labs ID		ABX588			ABX588			ABX589		
Sampling Date		2021/07/14 09:45			2021/07/14 09:45			2021/07/14 09:45		
COC Number		640722-01-01			640722-01-01			640722-01-01		
	UNITS	FIELD BLANK	RDL	QC Batch	FIELD BLANK Lab-Dup	RDL	QC Batch	TRIP BLANK	RDL	QC Batch
Dissolved Zirconium (Zr)	ug/L	<0.10	0.10	A290604	<0.10	0.10	A290604	<0.10	0.10	A290604
Dissolved Calcium (Ca)	mg/L	<0.050	0.050	A288626				<0.050	0.050	A288626
Dissolved Magnesium (Mg)	mg/L	<0.050	0.050	A288626				<0.050	0.050	A288626
Dissolved Potassium (K)	mg/L	<0.050	0.050	A288626				<0.050	0.050	A288626
Dissolved Sodium (Na)	mg/L	<0.050	0.050	A288626				<0.050	0.050	A288626
Dissolved Sulphur (S)	mg/L	<3.0	3.0	A288626				<3.0	3.0	A288626

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LOW LEVEL TOTAL METALS WITH CV HG (WATER)

BV Labs ID		ABX355			ABX355			ABX356		
Sampling Date		2021/07/13 10:50			2021/07/13 10:50			2021/07/13 11:45		
COC Number		640722-01-01			640722-01-01			640722-01-01		
	UNITS	VC-U	RDL	QC Batch	VC-U Lab-Dup	RDL	QC Batch	VC-REF	RDL	QC Batch
Calculated Parameters										
Total Hardness (CaCO3)	mg/L	93.7	0.50	A288354				93.9	0.50	A288354
Elements										
Total Mercury (Hg)	ug/L	<0.0019	0.0019	A291994				<0.0019	0.0019	A291994
Total Metals by ICPMS										
Total Aluminum (Al)	ug/L	13.2	0.50	A290362	13.0	0.50	A290362	12.9	0.50	A290362
Total Antimony (Sb)	ug/L	0.085	0.020	A290362	0.080	0.020	A290362	0.083	0.020	A290362
Total Arsenic (As)	ug/L	0.230	0.020	A290362	0.227	0.020	A290362	0.228	0.020	A290362
Total Barium (Ba)	ug/L	63.2	0.020	A290362	63.2	0.020	A290362	61.3	0.020	A290362
Total Beryllium (Be)	ug/L	<0.010	0.010	A290362	0.012	0.010	A290362	<0.010	0.010	A290362
Total Bismuth (Bi)	ug/L	<0.0050	0.0050	A290362	<0.0050	0.0050	A290362	<0.0050	0.0050	A290362
Total Boron (B)	ug/L	<10	10	A290362	<10	10	A290362	<10	10	A290362
Total Cadmium (Cd)	ug/L	0.0147	0.0050	A290362	0.0173	0.0050	A290362	0.0120	0.0050	A290362
Total Chromium (Cr)	ug/L	<0.10	0.10	A290362	<0.10	0.10	A290362	<0.10	0.10	A290362
Total Cobalt (Co)	ug/L	0.0353	0.0050	A290362	0.0376	0.0050	A290362	0.0361	0.0050	A290362
Total Copper (Cu)	ug/L	1.02	0.050	A290362	1.02	0.050	A290362	1.01	0.050	A290362
Total Iron (Fe)	ug/L	31.6	1.0	A290362	31.0	1.0	A290362	31.4	1.0	A290362
Total Lead (Pb)	ug/L	0.0076	0.0050	A290362	0.0095	0.0050	A290362	0.0079	0.0050	A290362
Total Lithium (Li)	ug/L	0.68	0.50	A290362	0.69	0.50	A290362	0.72	0.50	A290362
Total Manganese (Mn)	ug/L	34.0	0.050	A290362	34.5	0.050	A290362	18.0	0.050	A290362
Total Molybdenum (Mo)	ug/L	0.424	0.050	A290362	0.408	0.050	A290362	0.410	0.050	A290362
Total Nickel (Ni)	ug/L	0.266	0.020	A290362	0.270	0.020	A290362	0.251	0.020	A290362
Total Phosphorus (P)	ug/L	<2.0	2.0	A290362	<2.0	2.0	A290362	<2.0	2.0	A290362
Total Selenium (Se)	ug/L	<0.040	0.040	A290362	0.042	0.040	A290362	0.043	0.040	A290362
Total Silicon (Si)	ug/L	5740	50	A290362	5620	50	A290362	5650	50	A290362
Total Silver (Ag)	ug/L	<0.0050	0.0050	A290362	<0.0050	0.0050	A290362	<0.0050	0.0050	A290362
Total Strontium (Sr)	ug/L	290	0.050	A290362	280	0.050	A290362	294	0.050	A290362
Total Thallium (Tl)	ug/L	<0.0020	0.0020	A290362	<0.0020	0.0020	A290362	<0.0020	0.0020	A290362
Total Tin (Sn)	ug/L	<0.20	0.20	A290362	<0.20	0.20	A290362	<0.20	0.20	A290362
Total Titanium (Ti)	ug/L	<0.50	0.50	A290362	<0.50	0.50	A290362	<0.50	0.50	A290362
Total Uranium (U)	ug/L	0.595	0.0020	A290362	0.599	0.0020	A290362	0.644	0.0020	A290362
Total Vanadium (V)	ug/L	<0.20	0.20	A290362	<0.20	0.20	A290362	<0.20	0.20	A290362
Total Zinc (Zn)	ug/L	0.53	0.10	A290362	0.53	0.10	A290362	0.46	0.10	A290362

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LOW LEVEL TOTAL METALS WITH CV HG (WATER)

BV Labs ID		ABX355			ABX355			ABX356		
Sampling Date		2021/07/13 10:50			2021/07/13 10:50			2021/07/13 11:45		
COC Number		640722-01-01			640722-01-01			640722-01-01		
	UNITS	VC-U	RDL	QC Batch	VC-U Lab-Dup	RDL	QC Batch	VC-REF	RDL	QC Batch
Total Zirconium (Zr)	ug/L	<0.10	0.10	A290362	<0.10	0.10	A290362	<0.10	0.10	A290362
Total Calcium (Ca)	mg/L	23.8	0.050	A288627				23.3	0.050	A288627
Total Magnesium (Mg)	mg/L	8.34	0.050	A288627				8.70	0.050	A288627
Total Potassium (K)	mg/L	0.619	0.050	A288627				0.623	0.050	A288627
Total Sodium (Na)	mg/L	2.36	0.050	A288627				2.36	0.050	A288627
Total Sulphur (S)	mg/L	5.1	3.0	A288627				5.2	3.0	A288627

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LOW LEVEL TOTAL METALS WITH CV HG (WATER)

BV Labs ID		ABX357			ABX357			ABX359		
Sampling Date		2021/07/13 14:30			2021/07/13 14:30			2021/07/13 10:20		
COC Number		640722-01-01			640722-01-01			640722-01-01		
	UNITS	VC-R	RDL	QC Batch	VC-R Lab-Dup	RDL	QC Batch	BC	RDL	QC Batch
Calculated Parameters										
Total Hardness (CaCO3)	mg/L	113	0.50	A288354				180	0.50	A288354
Elements										
Total Mercury (Hg)	ug/L	<0.0019 (1)	0.0019	A292036	<0.0019	0.0019	A292036	<0.0019	0.0019	A292036
Total Metals by ICPMS										
Total Aluminum (Al)	ug/L	17.4	0.50	A290362				15.0	0.50	A290362
Total Antimony (Sb)	ug/L	0.243	0.020	A290362				0.267	0.020	A290362
Total Arsenic (As)	ug/L	1.16	0.020	A290362				3.09	0.020	A290362
Total Barium (Ba)	ug/L	63.3	0.020	A290362				47.6	0.020	A290362
Total Beryllium (Be)	ug/L	<0.010	0.010	A290362				<0.010	0.010	A290362
Total Bismuth (Bi)	ug/L	<0.0050	0.0050	A290362				<0.0050	0.0050	A290362
Total Boron (B)	ug/L	<10	10	A290362				<10	10	A290362
Total Cadmium (Cd)	ug/L	0.0178	0.0050	A290362				0.0859	0.0050	A290362
Total Chromium (Cr)	ug/L	<0.10	0.10	A290362				<0.10	0.10	A290362
Total Cobalt (Co)	ug/L	0.0818	0.0050	A290362				0.262	0.0050	A290362
Total Copper (Cu)	ug/L	1.15	0.050	A290362				1.15	0.050	A290362
Total Iron (Fe)	ug/L	122	1.0	A290362				216	1.0	A290362
Total Lead (Pb)	ug/L	0.0258	0.0050	A290362				0.0705	0.0050	A290362
Total Lithium (Li)	ug/L	0.79	0.50	A290362				1.47	0.50	A290362
Total Manganese (Mn)	ug/L	34.2	0.050	A290362				514	0.050	A290362
Total Molybdenum (Mo)	ug/L	0.404	0.050	A290362				0.980	0.050	A290362
Total Nickel (Ni)	ug/L	0.407	0.020	A290362				0.679	0.020	A290362
Total Phosphorus (P)	ug/L	<2.0	2.0	A290362				3.5	2.0	A290362
Total Selenium (Se)	ug/L	0.049	0.040	A290362				0.047	0.040	A290362
Total Silicon (Si)	ug/L	5850	50	A290362				6730	50	A290362
Total Silver (Ag)	ug/L	<0.0050	0.0050	A290362				<0.0050	0.0050	A290362
Total Strontium (Sr)	ug/L	280	0.050	A290362				362	0.050	A290362
Total Thallium (Tl)	ug/L	<0.0020	0.0020	A290362				0.0055	0.0020	A290362
Total Tin (Sn)	ug/L	<0.20	0.20	A290362				<0.20	0.20	A290362
Total Titanium (Ti)	ug/L	<0.50	0.50	A290362				<0.50	0.50	A290362
Total Uranium (U)	ug/L	0.629	0.0020	A290362				2.37	0.0020	A290362
Total Vanadium (V)	ug/L	<0.20	0.20	A290362				<0.20	0.20	A290362

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
(1) Matrix Spike exceeds acceptance limits - Probable matrix interference.

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LOW LEVEL TOTAL METALS WITH CV HG (WATER)

BV Labs ID		ABX357			ABX357			ABX359		
Sampling Date		2021/07/13 14:30			2021/07/13 14:30			2021/07/13 10:20		
COC Number		640722-01-01			640722-01-01			640722-01-01		
	UNITS	VC-R	RDL	QC Batch	VC-R Lab-Dup	RDL	QC Batch	BC	RDL	QC Batch
Total Zinc (Zn)	ug/L	0.70	0.10	A290362				1.62	0.10	A290362
Total Zirconium (Zr)	ug/L	0.14	0.10	A290362				0.11	0.10	A290362
Total Calcium (Ca)	mg/L	28.3	0.050	A288627				50.1	0.050	A288627
Total Magnesium (Mg)	mg/L	10.3	0.050	A288627				13.4	0.050	A288627
Total Potassium (K)	mg/L	0.783	0.050	A288627				0.990	0.050	A288627
Total Sodium (Na)	mg/L	2.89	0.050	A288627				4.00	0.050	A288627
Total Sulphur (S)	mg/L	12.8	3.0	A288627				23.1	3.0	A288627

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LOW LEVEL TOTAL METALS WITH CV HG (WATER)

BV Labs ID		ABX587			ABX588			ABX588		
Sampling Date		2021/07/14 09:45			2021/07/14 09:45			2021/07/14 09:45		
COC Number		640722-01-01			640722-01-01			640722-01-01		
	UNITS	MS BACK	RDL	QC Batch	FIELD BLANK	RDL	QC Batch	FIELD BLANK Lab-Dup	RDL	QC Batch
Calculated Parameters										
Total Hardness (CaCO3)	mg/L	1410	0.50	A288354	<0.50	0.50	A288354			
Elements										
Total Mercury (Hg)	ug/L	<0.0019	0.0019	A290685	<0.0019	0.0019	A292036			
Total Metals by ICPMS										
Total Aluminum (Al)	ug/L	4.8	1.0	A290362	1.08	0.50	A290362	1.41	0.50	A290362
Total Antimony (Sb)	ug/L	0.416	0.040	A290362	<0.020	0.020	A290362	<0.020	0.020	A290362
Total Arsenic (As)	ug/L	49.0	0.040	A290362	<0.020	0.020	A290362	<0.020	0.020	A290362
Total Barium (Ba)	ug/L	11.6	0.040	A290362	0.030	0.020	A290362	0.031	0.020	A290362
Total Beryllium (Be)	ug/L	<0.020	0.020	A290362	<0.010	0.010	A290362	<0.010	0.010	A290362
Total Bismuth (Bi)	ug/L	<0.010	0.010	A290362	<0.0050	0.0050	A290362	<0.0050	0.0050	A290362
Total Boron (B)	ug/L	<20	20	A290362	<10	10	A290362	<10	10	A290362
Total Cadmium (Cd)	ug/L	0.087	0.010	A290362	<0.0050	0.0050	A290362	<0.0050	0.0050	A290362
Total Chromium (Cr)	ug/L	<0.20	0.20	A290362	<0.10	0.10	A290362	<0.10	0.10	A290362
Total Cobalt (Co)	ug/L	0.245	0.010	A290362	<0.0050	0.0050	A290362	<0.0050	0.0050	A290362
Total Copper (Cu)	ug/L	0.87	0.10	A290362	<0.050	0.050	A290362	0.062	0.050	A290362
Total Iron (Fe)	ug/L	42.5	2.0	A290362	<1.0	1.0	A290362	<1.0	1.0	A290362
Total Lead (Pb)	ug/L	0.117	0.010	A290362	<0.0050	0.0050	A290362	0.0079	0.0050	A290362
Total Lithium (Li)	ug/L	16.5	1.0	A290362	<0.50	0.50	A290362	<0.50	0.50	A290362
Total Manganese (Mn)	ug/L	315	0.10	A290362	<0.050	0.050	A290362	<0.050	0.050	A290362
Total Molybdenum (Mo)	ug/L	<0.10	0.10	A290362	<0.050	0.050	A290362	<0.050	0.050	A290362
Total Nickel (Ni)	ug/L	0.472	0.040	A290362	<0.020	0.020	A290362	<0.020	0.020	A290362
Total Phosphorus (P)	ug/L	<4.0	4.0	A290362	<2.0	2.0	A290362	<2.0	2.0	A290362
Total Selenium (Se)	ug/L	0.126	0.080	A290362	<0.040	0.040	A290362	<0.040	0.040	A290362
Total Silicon (Si)	ug/L	5480	100	A290362	<50	50	A290362	<50	50	A290362
Total Silver (Ag)	ug/L	<0.010	0.010	A290362	<0.0050	0.0050	A290362	<0.0050	0.0050	A290362
Total Strontium (Sr)	ug/L	765	0.10	A290362	0.130	0.050	A290362	0.136	0.050	A290362
Total Thallium (Tl)	ug/L	0.226	0.0040	A290362	<0.0020	0.0020	A290362	<0.0020	0.0020	A290362
Total Tin (Sn)	ug/L	<0.40	0.40	A290362	<0.20	0.20	A290362	<0.20	0.20	A290362
Total Titanium (Ti)	ug/L	<1.0	1.0	A290362	<0.50	0.50	A290362	<0.50	0.50	A290362
Total Uranium (U)	ug/L	6.99	0.0040	A290362	0.0023	0.0020	A290362	0.0035	0.0020	A290362
Total Vanadium (V)	ug/L	<0.40	0.40	A290362	<0.20	0.20	A290362	<0.20	0.20	A290362
Total Zinc (Zn)	ug/L	7.84	0.20	A290362	<0.10	0.10	A290362	<0.10	0.10	A290362

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LOW LEVEL TOTAL METALS WITH CV HG (WATER)

BV Labs ID		ABX587			ABX588			ABX588		
Sampling Date		2021/07/14 09:45			2021/07/14 09:45			2021/07/14 09:45		
COC Number		640722-01-01			640722-01-01			640722-01-01		
	UNITS	MS BACK	RDL	QC Batch	FIELD BLANK	RDL	QC Batch	FIELD BLANK Lab-Dup	RDL	QC Batch
Total Zirconium (Zr)	ug/L	<0.20	0.20	A290362	<0.10	0.10	A290362	<0.10	0.10	A290362
Total Calcium (Ca)	mg/L	302	0.10	A288627	<0.050	0.050	A288627			
Total Magnesium (Mg)	mg/L	160	0.10	A288627	<0.050	0.050	A288627			
Total Potassium (K)	mg/L	5.51	0.10	A288627	<0.050	0.050	A288627			
Total Sodium (Na)	mg/L	7.27	0.10	A288627	<0.050	0.050	A288627			
Total Sulphur (S)	mg/L	350	6.0	A288627	<3.0	3.0	A288627			

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LOW LEVEL TOTAL METALS WITH CV HG (WATER)

BV Labs ID		ABX589		
Sampling Date		2021/07/14 09:45		
COC Number		640722-01-01		
	UNITS	TRIP BLANK	RDL	QC Batch
Calculated Parameters				
Total Hardness (CaCO3)	mg/L	<0.50	0.50	A288354
Elements				
Total Mercury (Hg)	ug/L	<0.0019	0.0019	A292036
Total Metals by ICPMS				
Total Aluminum (Al)	ug/L	<0.50	0.50	A290362
Total Antimony (Sb)	ug/L	<0.020	0.020	A290362
Total Arsenic (As)	ug/L	<0.020	0.020	A290362
Total Barium (Ba)	ug/L	<0.020	0.020	A290362
Total Beryllium (Be)	ug/L	<0.010	0.010	A290362
Total Bismuth (Bi)	ug/L	<0.0050	0.0050	A290362
Total Boron (B)	ug/L	<10	10	A290362
Total Cadmium (Cd)	ug/L	<0.0050	0.0050	A290362
Total Chromium (Cr)	ug/L	<0.10	0.10	A290362
Total Cobalt (Co)	ug/L	<0.0050	0.0050	A290362
Total Copper (Cu)	ug/L	<0.050	0.050	A290362
Total Iron (Fe)	ug/L	<1.0	1.0	A290362
Total Lead (Pb)	ug/L	<0.0050	0.0050	A290362
Total Lithium (Li)	ug/L	<0.50	0.50	A290362
Total Manganese (Mn)	ug/L	<0.050	0.050	A290362
Total Molybdenum (Mo)	ug/L	<0.050	0.050	A290362
Total Nickel (Ni)	ug/L	<0.020	0.020	A290362
Total Phosphorus (P)	ug/L	<2.0	2.0	A290362
Total Selenium (Se)	ug/L	<0.040	0.040	A290362
Total Silicon (Si)	ug/L	<50	50	A290362
Total Silver (Ag)	ug/L	<0.0050	0.0050	A290362
Total Strontium (Sr)	ug/L	<0.050	0.050	A290362
Total Thallium (Tl)	ug/L	<0.0020	0.0020	A290362
Total Tin (Sn)	ug/L	<0.20	0.20	A290362
Total Titanium (Ti)	ug/L	<0.50	0.50	A290362
Total Uranium (U)	ug/L	<0.0020	0.0020	A290362
Total Vanadium (V)	ug/L	<0.20	0.20	A290362
Total Zinc (Zn)	ug/L	<0.10	0.10	A290362
Total Zirconium (Zr)	ug/L	<0.10	0.10	A290362
RDL = Reportable Detection Limit				

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LOW LEVEL TOTAL METALS WITH CV HG (WATER)

BV Labs ID		ABX589		
Sampling Date		2021/07/14 09:45		
COC Number		640722-01-01		
	UNITS	TRIP BLANK	RDL	QC Batch
Total Calcium (Ca)	mg/L	<0.050	0.050	A288627
Total Magnesium (Mg)	mg/L	<0.050	0.050	A288627
Total Potassium (K)	mg/L	<0.050	0.050	A288627
Total Sodium (Na)	mg/L	<0.050	0.050	A288627
Total Sulphur (S)	mg/L	<3.0	3.0	A288627
RDL = Reportable Detection Limit				

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LL TOTAL METALS (DIGESTED) WITH CV HG

BV Labs ID		ABX350	ABX351	ABX352	ABX353	ABX354		
Sampling Date		2021/07/14 09:45	2021/07/14 10:20	2021/07/14 10:45	2021/07/14 09:00	2021/07/14 09:15		
COC Number		640722-01-01	640722-01-01	640722-01-01	640722-01-01	640722-01-01		
	UNITS	PC-U	DC-U	DC-B	DC-UVC	DC-R	RDL	QC Batch
Calculated Parameters								
Total Hardness (CaCO3)	mg/L	414	744	813	632	654	0.50	A288354
Elements								
Total Mercury (Hg)	ug/L	<0.0019	<0.0019	<0.0019	<0.0019	<0.0019	0.0019	A291994
Total Metals by ICPMS								
Total Aluminum (Al)	ug/L	392	55.6	103	8.3	8.3	3.0	A291762
Total Antimony (Sb)	ug/L	1.85	1.58	2.38	1.22	1.47	0.020	A291762
Total Arsenic (As)	ug/L	11.2	15.2	10.7	7.80	8.99	0.020	A291762
Total Barium (Ba)	ug/L	49.2	46.2	47.6	29.6	35.1	0.050	A291762
Total Beryllium (Be)	ug/L	0.025	<0.010	<0.010	<0.010	<0.010	0.010	A291762
Total Bismuth (Bi)	ug/L	0.023	<0.010	<0.010	<0.010	<0.010	0.010	A291762
Total Boron (B)	ug/L	<10	23	16	17	18	10	A291762
Total Cadmium (Cd)	ug/L	1.30	0.111	0.180	0.0115	0.0151	0.0050	A291762
Total Chromium (Cr)	ug/L	0.46	0.18	0.21	0.13	0.12	0.10	A291762
Total Cobalt (Co)	ug/L	0.630	1.04	0.406	0.594	0.689	0.010	A291762
Total Copper (Cu)	ug/L	5.24	0.94	0.86	0.98	1.09	0.10	A291762
Total Iron (Fe)	ug/L	783	1380	1700	113	513	5.0	A291762
Total Lead (Pb)	ug/L	3.95	0.103	0.180	0.092	0.081	0.020	A291762
Total Lithium (Li)	ug/L	2.94	3.96	5.66	2.42	2.66	0.50	A291762
Total Manganese (Mn)	ug/L	427	935	481	63.7	97.9	0.10	A291762
Total Molybdenum (Mo)	ug/L	0.327	0.386	0.343	0.318	0.362	0.050	A291762
Total Nickel (Ni)	ug/L	1.09	0.88	0.78	0.64	0.71	0.10	A291762
Total Phosphorus (P)	ug/L	52.3	14.5	13.9	7.4	5.4	5.0	A291762
Total Selenium (Se)	ug/L	0.057	0.083	0.070	0.075	0.073	0.040	A291762
Total Silicon (Si)	ug/L	5860	5650	5840	5300	5360	50	A291762
Total Silver (Ag)	ug/L	0.021	<0.010	<0.010	<0.010	<0.010	0.010	A291762
Total Strontium (Sr)	ug/L	718	665	689	521	561	0.050	A291762
Total Thallium (Tl)	ug/L	0.0188	0.0034	0.0040	<0.0020	<0.0020	0.0020	A291762
Total Tin (Sn)	ug/L	<0.20	<0.20	<0.20	<0.20	<0.20	0.20	A291762
Total Titanium (Ti)	ug/L	22.6	2.8	5.4	<2.0	<2.0	2.0	A291762
Total Uranium (U)	ug/L	3.69	2.55	3.28	1.90	2.16	0.0050	A291762
Total Vanadium (V)	ug/L	1.19	0.36	0.64	<0.20	<0.20	0.20	A291762
Total Zinc (Zn)	ug/L	112	28.7	47.0	2.5	2.9	1.0	A291762
Total Zirconium (Zr)	ug/L	<0.10	0.13	<0.10	0.14	0.15	0.10	A291762
Total Calcium (Ca)	mg/L	123	181	184	153	159	0.25	A288627

RDL = Reportable Detection Limit

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LL TOTAL METALS (DIGESTED) WITH CV HG

BV Labs ID		ABX350	ABX351	ABX352	ABX353	ABX354		
Sampling Date		2021/07/14 09:45	2021/07/14 10:20	2021/07/14 10:45	2021/07/14 09:00	2021/07/14 09:15		
COC Number		640722-01-01	640722-01-01	640722-01-01	640722-01-01	640722-01-01		
	UNITS	PC-U	DC-U	DC-B	DC-UVC	DC-R	RDL	QC Batch
Total Magnesium (Mg)	mg/L	25.9	71.0	86.2	60.4	62.7	0.25	A288627
Total Potassium (K)	mg/L	1.55	3.20	2.97	2.87	3.04	0.25	A288627
Total Sodium (Na)	mg/L	6.89	11.7	8.17	11.3	11.5	0.25	A288627
Total Sulphur (S)	mg/L	85.0	191	207	160	165	3.0	A288627
RDL = Reportable Detection Limit								

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LL TOTAL METALS (DIGESTED) WITH CV HG

BV Labs ID		ABX358		ABX585	ABX586		
Sampling Date		2021/07/12 15:25		2021/07/14 09:45	2021/07/14 09:45		
COC Number		640722-01-01		640722-01-01	640722-01-01		
	UNITS	VC-BG	QC Batch	BC-R	MN	RDL	QC Batch
Calculated Parameters							
Total Hardness (CaCO3)	mg/L	107	A288354	171	46.7	0.50	A288354
Elements							
Total Mercury (Hg)	ug/L	<0.0019	A292036	<0.0019	0.0028	0.0019	A290685
Total Metals by ICPMS							
Total Aluminum (Al)	ug/L	14.4	A291762	15.0	78.1	3.0	A291762
Total Antimony (Sb)	ug/L	0.036	A291762	0.252	0.104	0.020	A291762
Total Arsenic (As)	ug/L	0.175	A291762	3.02	1.93	0.020	A291762
Total Barium (Ba)	ug/L	74.9	A291762	45.0	65.6	0.050	A291762
Total Beryllium (Be)	ug/L	<0.010	A291762	<0.010	0.019	0.010	A291762
Total Bismuth (Bi)	ug/L	<0.010	A291762	<0.010	<0.010	0.010	A291762
Total Boron (B)	ug/L	<10	A291762	<10	<10	10	A291762
Total Cadmium (Cd)	ug/L	<0.0050	A291762	0.0717	0.0217	0.0050	A291762
Total Chromium (Cr)	ug/L	<0.10	A291762	<0.10	0.40	0.10	A291762
Total Cobalt (Co)	ug/L	0.022	A291762	0.260	0.560	0.010	A291762
Total Copper (Cu)	ug/L	0.65	A291762	1.25	1.93	0.10	A291762
Total Iron (Fe)	ug/L	64.8	A291762	203	1540	5.0	A291762
Total Lead (Pb)	ug/L	<0.020	A291762	0.098	0.024	0.020	A291762
Total Lithium (Li)	ug/L	1.77	A291762	1.36	1.25	0.50	A291762
Total Manganese (Mn)	ug/L	5.69	A291762	492	148	0.10	A291762
Total Molybdenum (Mo)	ug/L	0.254	A291762	0.944	0.291	0.050	A291762
Total Nickel (Ni)	ug/L	0.29	A291762	0.77	1.96	0.10	A291762
Total Phosphorus (P)	ug/L	<5.0	A291762	8.1	11.0	5.0	A291762
Total Selenium (Se)	ug/L	<0.040	A291762	0.045	0.096	0.040	A291762
Total Silicon (Si)	ug/L	5520	A291762	5990	7060	50	A291762
Total Silver (Ag)	ug/L	<0.010	A291762	<0.010	<0.010	0.010	A291762
Total Strontium (Sr)	ug/L	344	A291762	329	72.3	0.050	A291762
Total Thallium (Tl)	ug/L	<0.0020	A291762	<0.0020	0.0024	0.0020	A291762
Total Tin (Sn)	ug/L	<0.20	A291762	<0.20	<0.20	0.20	A291762
Total Titanium (Ti)	ug/L	<2.0	A291762	<2.0	<2.0	2.0	A291762
Total Uranium (U)	ug/L	0.955	A291762	2.31	0.198	0.0050	A291762
Total Vanadium (V)	ug/L	<0.20	A291762	<0.20	0.75	0.20	A291762
Total Zinc (Zn)	ug/L	<1.0	A291762	1.3	1.8	1.0	A291762
Total Zirconium (Zr)	ug/L	<0.10	A291762	<0.10	0.54	0.10	A291762
Total Calcium (Ca)	mg/L	24.9	A288627	47.3	12.2	0.25	A288627

RDL = Reportable Detection Limit

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LL TOTAL METALS (DIGESTED) WITH CV HG

BV Labs ID		ABX358		ABX585	ABX586		
Sampling Date		2021/07/12 15:25		2021/07/14 09:45	2021/07/14 09:45		
COC Number		640722-01-01		640722-01-01	640722-01-01		
	UNITS	VC-BG	QC Batch	BC-R	MN	RDL	QC Batch
Total Magnesium (Mg)	mg/L	10.8	A288627	12.9	3.95	0.25	A288627
Total Potassium (K)	mg/L	0.72	A288627	0.96	0.80	0.25	A288627
Total Sodium (Na)	mg/L	2.56	A288627	3.98	2.14	0.25	A288627
Total Sulphur (S)	mg/L	4.7	A288627	21.8	<3.0	3.0	A288627
RDL = Reportable Detection Limit							

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

GENERAL COMMENTS

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

Package 1	4.0°C
Package 2	3.7°C
Package 3	3.3°C
Package 4	3.7°C

Sample ABX355 [VC-U] : Sample was analyzed past method specified hold time for Nitrate+Nitrite (N) (low level). Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised. Sample was analyzed past method specified hold time for Nitrite (N) (low level).

Sample ABX356 [VC-REF] : Sample was analyzed past method specified hold time for Nitrate+Nitrite (N) (low level). Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised. Sample was analyzed past method specified hold time for Nitrite (N) (low level).

Sample ABX357 [VC-R] : Sample was analyzed past method specified hold time for Nitrate+Nitrite (N) (low level). Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised. Sample was analyzed past method specified hold time for Nitrite (N) (low level).

Sample ABX358 [VC-BG] : Sample was analyzed past method specified hold time for Nitrate+Nitrite (N) (low level). Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised. Sample was analyzed past method specified hold time for Nitrite (N) (low level). Sample was analyzed past method specified hold time for Total Dissolved Solids - Low Level. Sample was analyzed past method specified hold time for Total Sulphide.

Sample ABX359 [BC] : Sample was analyzed past method specified hold time for Nitrate+Nitrite (N) (low level). Exceedance of hold time increases the uncertainty of test results but does not necessarily imply that results are compromised. Sample was analyzed past method specified hold time for Nitrite (N) (low level).

Results relate only to the items tested.

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A289468	TL9	Matrix Spike [ABX585-02]	Nitrate plus Nitrite (N)	2021/07/17		94	%	80 - 120
A289468	TL9	Spiked Blank	Nitrate plus Nitrite (N)	2021/07/17		106	%	80 - 120
A289468	TL9	Method Blank	Nitrate plus Nitrite (N)	2021/07/17	<0.0020		mg/L	
A289468	TL9	RPD [ABX585-02]	Nitrate plus Nitrite (N)	2021/07/17	2.1		%	25
A289470	TL9	Matrix Spike [ABX585-02]	Nitrite (N)	2021/07/17		91	%	80 - 120
A289470	TL9	Spiked Blank	Nitrite (N)	2021/07/17		102	%	80 - 120
A289470	TL9	Method Blank	Nitrite (N)	2021/07/17	<0.0020		mg/L	
A289470	TL9	RPD [ABX585-02]	Nitrite (N)	2021/07/17	NC		%	25
A290362	AA1	Matrix Spike [ABX355-05]	Total Aluminum (Al)	2021/07/20		103	%	80 - 120
			Total Antimony (Sb)	2021/07/20		104	%	80 - 120
			Total Arsenic (As)	2021/07/20		102	%	80 - 120
			Total Barium (Ba)	2021/07/20		NC	%	80 - 120
			Total Beryllium (Be)	2021/07/20		106	%	80 - 120
			Total Bismuth (Bi)	2021/07/20		92	%	80 - 120
			Total Boron (B)	2021/07/20		105	%	80 - 120
			Total Cadmium (Cd)	2021/07/20		104	%	80 - 120
			Total Chromium (Cr)	2021/07/20		100	%	80 - 120
			Total Cobalt (Co)	2021/07/20		99	%	80 - 120
			Total Copper (Cu)	2021/07/20		95	%	80 - 120
			Total Iron (Fe)	2021/07/20		102	%	80 - 120
			Total Lead (Pb)	2021/07/20		99	%	80 - 120
			Total Lithium (Li)	2021/07/20		106	%	80 - 120
			Total Manganese (Mn)	2021/07/20		94	%	80 - 120
			Total Molybdenum (Mo)	2021/07/20		104	%	80 - 120
			Total Nickel (Ni)	2021/07/20		95	%	80 - 120
			Total Phosphorus (P)	2021/07/20		102	%	80 - 120
			Total Selenium (Se)	2021/07/20		107	%	80 - 120
			Total Silicon (Si)	2021/07/20		NC	%	80 - 120
			Total Silver (Ag)	2021/07/20		101	%	80 - 120
			Total Strontium (Sr)	2021/07/20		NC	%	80 - 120
			Total Thallium (Tl)	2021/07/20		101	%	80 - 120
			Total Tin (Sn)	2021/07/20		103	%	80 - 120
			Total Titanium (Ti)	2021/07/20		102	%	80 - 120
			Total Uranium (U)	2021/07/20		103	%	80 - 120
			Total Vanadium (V)	2021/07/20		100	%	80 - 120
			Total Zinc (Zn)	2021/07/20		101	%	80 - 120
			Total Zirconium (Zr)	2021/07/20		104	%	80 - 120
A290362	AA1	Spiked Blank	Total Aluminum (Al)	2021/07/20		102	%	80 - 120
			Total Antimony (Sb)	2021/07/20		100	%	80 - 120
			Total Arsenic (As)	2021/07/20		97	%	80 - 120
			Total Barium (Ba)	2021/07/20		98	%	80 - 120
			Total Beryllium (Be)	2021/07/20		99	%	80 - 120
			Total Bismuth (Bi)	2021/07/20		96	%	80 - 120
			Total Boron (B)	2021/07/20		103	%	80 - 120
			Total Cadmium (Cd)	2021/07/20		100	%	80 - 120
			Total Chromium (Cr)	2021/07/20		98	%	80 - 120
			Total Cobalt (Co)	2021/07/20		99	%	80 - 120
			Total Copper (Cu)	2021/07/20		93	%	80 - 120
			Total Iron (Fe)	2021/07/20		101	%	80 - 120
			Total Lead (Pb)	2021/07/20		96	%	80 - 120
			Total Lithium (Li)	2021/07/20		97	%	80 - 120
			Total Manganese (Mn)	2021/07/20		96	%	80 - 120
			Total Molybdenum (Mo)	2021/07/20		99	%	80 - 120
			Total Nickel (Ni)	2021/07/20		97	%	80 - 120
			Total Phosphorus (P)	2021/07/20		98	%	80 - 120

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Selenium (Se)	2021/07/20		97	%	80 - 120
			Total Silicon (Si)	2021/07/20		100	%	80 - 120
			Total Silver (Ag)	2021/07/20		97	%	80 - 120
			Total Strontium (Sr)	2021/07/20		97	%	80 - 120
			Total Thallium (Tl)	2021/07/20		97	%	80 - 120
			Total Tin (Sn)	2021/07/20		103	%	80 - 120
			Total Titanium (Ti)	2021/07/20		98	%	80 - 120
			Total Uranium (U)	2021/07/20		98	%	80 - 120
			Total Vanadium (V)	2021/07/20		98	%	80 - 120
			Total Zinc (Zn)	2021/07/20		99	%	80 - 120
			Total Zirconium (Zr)	2021/07/20		99	%	80 - 120
A290362	AA1	Method Blank	Total Aluminum (Al)	2021/07/20	<0.50		ug/L	
			Total Antimony (Sb)	2021/07/20	<0.020		ug/L	
			Total Arsenic (As)	2021/07/20	<0.020		ug/L	
			Total Barium (Ba)	2021/07/20	<0.020		ug/L	
			Total Beryllium (Be)	2021/07/20	<0.010		ug/L	
			Total Bismuth (Bi)	2021/07/20	<0.0050		ug/L	
			Total Boron (B)	2021/07/20	<10		ug/L	
			Total Cadmium (Cd)	2021/07/20	<0.0050		ug/L	
			Total Chromium (Cr)	2021/07/20	<0.10		ug/L	
			Total Cobalt (Co)	2021/07/20	<0.0050		ug/L	
			Total Copper (Cu)	2021/07/20	<0.050		ug/L	
			Total Iron (Fe)	2021/07/20	<1.0		ug/L	
			Total Lead (Pb)	2021/07/20	<0.0050		ug/L	
			Total Lithium (Li)	2021/07/20	<0.50		ug/L	
			Total Manganese (Mn)	2021/07/20	<0.050		ug/L	
			Total Molybdenum (Mo)	2021/07/20	<0.050		ug/L	
			Total Nickel (Ni)	2021/07/20	<0.020		ug/L	
			Total Phosphorus (P)	2021/07/20	<2.0		ug/L	
			Total Selenium (Se)	2021/07/20	<0.040		ug/L	
			Total Silicon (Si)	2021/07/20	<50		ug/L	
			Total Silver (Ag)	2021/07/20	<0.0050		ug/L	
			Total Strontium (Sr)	2021/07/20	<0.050		ug/L	
			Total Thallium (Tl)	2021/07/20	<0.0020		ug/L	
			Total Tin (Sn)	2021/07/20	<0.20		ug/L	
			Total Titanium (Ti)	2021/07/20	<0.50		ug/L	
			Total Uranium (U)	2021/07/20	<0.0020		ug/L	
			Total Vanadium (V)	2021/07/20	<0.20		ug/L	
			Total Zinc (Zn)	2021/07/20	<0.10		ug/L	
			Total Zirconium (Zr)	2021/07/20	<0.10		ug/L	
A290362	AA1	RPD [ABX355-05]	Total Aluminum (Al)	2021/07/20	2.0		%	20
			Total Antimony (Sb)	2021/07/20	5.1		%	20
			Total Arsenic (As)	2021/07/20	1.3		%	20
			Total Barium (Ba)	2021/07/20	0.029		%	20
			Total Beryllium (Be)	2021/07/20	14		%	20
			Total Bismuth (Bi)	2021/07/20	NC		%	20
			Total Boron (B)	2021/07/20	NC		%	20
			Total Cadmium (Cd)	2021/07/20	16		%	20
			Total Chromium (Cr)	2021/07/20	NC		%	20
			Total Cobalt (Co)	2021/07/20	6.3		%	20
			Total Copper (Cu)	2021/07/20	0.68		%	20
			Total Iron (Fe)	2021/07/20	1.8		%	20
			Total Lead (Pb)	2021/07/20	NC		%	20
			Total Lithium (Li)	2021/07/20	2.5		%	20
			Total Manganese (Mn)	2021/07/20	1.7		%	20

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Molybdenum (Mo)	2021/07/20	3.8		%	20
			Total Nickel (Ni)	2021/07/20	1.6		%	20
			Total Phosphorus (P)	2021/07/20	NC		%	20
			Total Selenium (Se)	2021/07/20	3.9		%	20
			Total Silicon (Si)	2021/07/20	2.3		%	20
			Total Silver (Ag)	2021/07/20	NC		%	20
			Total Strontium (Sr)	2021/07/20	3.5		%	20
			Total Thallium (Tl)	2021/07/20	NC		%	20
			Total Tin (Sn)	2021/07/20	NC		%	20
			Total Titanium (Ti)	2021/07/20	NC		%	20
			Total Uranium (U)	2021/07/20	0.55		%	20
			Total Vanadium (V)	2021/07/20	NC		%	20
			Total Zinc (Zn)	2021/07/20	0.73		%	20
			Total Zirconium (Zr)	2021/07/20	NC		%	20
A290362	AA1	RPD [ABX588-05]	Total Aluminum (Al)	2021/07/20	NC		%	20
			Total Antimony (Sb)	2021/07/20	NC		%	20
			Total Arsenic (As)	2021/07/20	NC		%	20
			Total Barium (Ba)	2021/07/20	2.7		%	20
			Total Beryllium (Be)	2021/07/20	NC		%	20
			Total Bismuth (Bi)	2021/07/20	NC		%	20
			Total Boron (B)	2021/07/20	NC		%	20
			Total Cadmium (Cd)	2021/07/20	NC		%	20
			Total Chromium (Cr)	2021/07/20	NC		%	20
			Total Cobalt (Co)	2021/07/20	NC		%	20
			Total Copper (Cu)	2021/07/20	NC		%	20
			Total Iron (Fe)	2021/07/20	NC		%	20
			Total Lead (Pb)	2021/07/20	NC		%	20
			Total Lithium (Li)	2021/07/20	NC		%	20
			Total Manganese (Mn)	2021/07/20	NC		%	20
			Total Molybdenum (Mo)	2021/07/20	NC		%	20
			Total Nickel (Ni)	2021/07/20	NC		%	20
			Total Phosphorus (P)	2021/07/20	NC		%	20
			Total Selenium (Se)	2021/07/20	NC		%	20
			Total Silicon (Si)	2021/07/20	NC		%	20
			Total Silver (Ag)	2021/07/20	NC		%	20
			Total Strontium (Sr)	2021/07/20	4.2		%	20
			Total Thallium (Tl)	2021/07/20	NC		%	20
			Total Tin (Sn)	2021/07/20	NC		%	20
			Total Titanium (Ti)	2021/07/20	NC		%	20
			Total Uranium (U)	2021/07/20	NC		%	20
			Total Vanadium (V)	2021/07/20	NC		%	20
			Total Zinc (Zn)	2021/07/20	NC		%	20
			Total Zirconium (Zr)	2021/07/20	NC		%	20
A290523	CJY	Matrix Spike	Dissolved Mercury (Hg)	2021/07/19		84	%	80 - 120
A290523	CJY	Spiked Blank	Dissolved Mercury (Hg)	2021/07/19		99	%	80 - 120
A290523	CJY	Method Blank	Dissolved Mercury (Hg)	2021/07/19	<0.0019		ug/L	
A290523	CJY	RPD	Dissolved Mercury (Hg)	2021/07/19	NC		%	20
A290604	AA1	Matrix Spike [ABX350-06]	Dissolved Aluminum (Al)	2021/07/20		98	%	80 - 120
			Dissolved Antimony (Sb)	2021/07/20		100	%	80 - 120
			Dissolved Arsenic (As)	2021/07/20		99	%	80 - 120
			Dissolved Barium (Ba)	2021/07/20		93	%	80 - 120
			Dissolved Beryllium (Be)	2021/07/20		104	%	80 - 120
			Dissolved Bismuth (Bi)	2021/07/20		91	%	80 - 120
			Dissolved Boron (B)	2021/07/20		95	%	80 - 120
			Dissolved Cadmium (Cd)	2021/07/20		99	%	80 - 120

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Chromium (Cr)	2021/07/20		97	%	80 - 120
			Dissolved Cobalt (Co)	2021/07/20		95	%	80 - 120
			Dissolved Copper (Cu)	2021/07/20		89	%	80 - 120
			Dissolved Iron (Fe)	2021/07/20		98	%	80 - 120
			Dissolved Lead (Pb)	2021/07/20		93	%	80 - 120
			Dissolved Lithium (Li)	2021/07/20		101	%	80 - 120
			Dissolved Manganese (Mn)	2021/07/20		NC	%	80 - 120
			Dissolved Molybdenum (Mo)	2021/07/20		104	%	80 - 120
			Dissolved Nickel (Ni)	2021/07/20		91	%	80 - 120
			Dissolved Phosphorus (P)	2021/07/20		101	%	80 - 120
			Dissolved Selenium (Se)	2021/07/20		106	%	80 - 120
			Dissolved Silicon (Si)	2021/07/20		NC	%	80 - 120
			Dissolved Silver (Ag)	2021/07/20		99	%	80 - 120
			Dissolved Strontium (Sr)	2021/07/20		NC	%	80 - 120
			Dissolved Thallium (Tl)	2021/07/20		94	%	80 - 120
			Dissolved Tin (Sn)	2021/07/20		100	%	80 - 120
			Dissolved Titanium (Ti)	2021/07/20		100	%	80 - 120
			Dissolved Uranium (U)	2021/07/20		96	%	80 - 120
			Dissolved Vanadium (V)	2021/07/20		98	%	80 - 120
			Dissolved Zinc (Zn)	2021/07/20		NC	%	80 - 120
			Dissolved Zirconium (Zr)	2021/07/20		104	%	80 - 120
A290604	AA1	Spiked Blank	Dissolved Aluminum (Al)	2021/07/20		100	%	80 - 120
			Dissolved Antimony (Sb)	2021/07/20		99	%	80 - 120
			Dissolved Arsenic (As)	2021/07/20		98	%	80 - 120
			Dissolved Barium (Ba)	2021/07/20		97	%	80 - 120
			Dissolved Beryllium (Be)	2021/07/20		102	%	80 - 120
			Dissolved Bismuth (Bi)	2021/07/20		97	%	80 - 120
			Dissolved Boron (B)	2021/07/20		99	%	80 - 120
			Dissolved Cadmium (Cd)	2021/07/20		98	%	80 - 120
			Dissolved Chromium (Cr)	2021/07/20		98	%	80 - 120
			Dissolved Cobalt (Co)	2021/07/20		98	%	80 - 120
			Dissolved Copper (Cu)	2021/07/20		93	%	80 - 120
			Dissolved Iron (Fe)	2021/07/20		100	%	80 - 120
			Dissolved Lead (Pb)	2021/07/20		97	%	80 - 120
			Dissolved Lithium (Li)	2021/07/20		100	%	80 - 120
			Dissolved Manganese (Mn)	2021/07/20		95	%	80 - 120
			Dissolved Molybdenum (Mo)	2021/07/20		99	%	80 - 120
			Dissolved Nickel (Ni)	2021/07/20		95	%	80 - 120
			Dissolved Phosphorus (P)	2021/07/20		98	%	80 - 120
			Dissolved Selenium (Se)	2021/07/20		103	%	80 - 120
			Dissolved Silicon (Si)	2021/07/20		99	%	80 - 120
			Dissolved Silver (Ag)	2021/07/20		96	%	80 - 120
			Dissolved Strontium (Sr)	2021/07/20		96	%	80 - 120
			Dissolved Thallium (Tl)	2021/07/20		98	%	80 - 120
			Dissolved Tin (Sn)	2021/07/20		100	%	80 - 120
			Dissolved Titanium (Ti)	2021/07/20		99	%	80 - 120
			Dissolved Uranium (U)	2021/07/20		98	%	80 - 120
			Dissolved Vanadium (V)	2021/07/20		97	%	80 - 120
			Dissolved Zinc (Zn)	2021/07/20		98	%	80 - 120
			Dissolved Zirconium (Zr)	2021/07/20		99	%	80 - 120
A290604	AA1	Method Blank	Dissolved Aluminum (Al)	2021/07/20	<0.50		ug/L	
			Dissolved Antimony (Sb)	2021/07/20	<0.020		ug/L	
			Dissolved Arsenic (As)	2021/07/20	<0.020		ug/L	
			Dissolved Barium (Ba)	2021/07/20	<0.020		ug/L	
			Dissolved Beryllium (Be)	2021/07/20	<0.010		ug/L	

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Bismuth (Bi)	2021/07/20	<0.0050		ug/L	
			Dissolved Boron (B)	2021/07/20	<10		ug/L	
			Dissolved Cadmium (Cd)	2021/07/20	<0.0050		ug/L	
			Dissolved Chromium (Cr)	2021/07/20	<0.10		ug/L	
			Dissolved Cobalt (Co)	2021/07/20	<0.0050		ug/L	
			Dissolved Copper (Cu)	2021/07/20	<0.050		ug/L	
			Dissolved Iron (Fe)	2021/07/20	<1.0		ug/L	
			Dissolved Lead (Pb)	2021/07/20	<0.0050		ug/L	
			Dissolved Lithium (Li)	2021/07/20	<0.50		ug/L	
			Dissolved Manganese (Mn)	2021/07/20	<0.050		ug/L	
			Dissolved Molybdenum (Mo)	2021/07/20	<0.050		ug/L	
			Dissolved Nickel (Ni)	2021/07/20	<0.020		ug/L	
			Dissolved Phosphorus (P)	2021/07/20	<2.0		ug/L	
			Dissolved Selenium (Se)	2021/07/20	<0.040		ug/L	
			Dissolved Silicon (Si)	2021/07/20	<50		ug/L	
			Dissolved Silver (Ag)	2021/07/20	<0.0050		ug/L	
			Dissolved Strontium (Sr)	2021/07/20	<0.050		ug/L	
			Dissolved Thallium (Tl)	2021/07/20	<0.0020		ug/L	
			Dissolved Tin (Sn)	2021/07/20	<0.20		ug/L	
			Dissolved Titanium (Ti)	2021/07/20	<0.50		ug/L	
			Dissolved Uranium (U)	2021/07/20	<0.0020		ug/L	
			Dissolved Vanadium (V)	2021/07/20	<0.20		ug/L	
			Dissolved Zinc (Zn)	2021/07/20	<0.10		ug/L	
			Dissolved Zirconium (Zr)	2021/07/20	<0.10		ug/L	
A290604	AA1	RPD [ABX350-06]	Dissolved Aluminum (Al)	2021/07/20	0.066		%	20
			Dissolved Antimony (Sb)	2021/07/20	1.5		%	20
			Dissolved Arsenic (As)	2021/07/20	0.37		%	20
			Dissolved Barium (Ba)	2021/07/20	0.17		%	20
			Dissolved Beryllium (Be)	2021/07/20	NC		%	20
			Dissolved Bismuth (Bi)	2021/07/20	NC		%	20
			Dissolved Boron (B)	2021/07/20	NC		%	20
			Dissolved Cadmium (Cd)	2021/07/20	0		%	20
			Dissolved Chromium (Cr)	2021/07/20	NC		%	20
			Dissolved Cobalt (Co)	2021/07/20	2.6		%	20
			Dissolved Copper (Cu)	2021/07/20	0.037		%	20
			Dissolved Iron (Fe)	2021/07/20	3.0		%	20
			Dissolved Lead (Pb)	2021/07/20	7.0		%	20
			Dissolved Lithium (Li)	2021/07/20	1.2		%	20
			Dissolved Manganese (Mn)	2021/07/20	0.38		%	20
			Dissolved Molybdenum (Mo)	2021/07/20	2.5		%	20
			Dissolved Nickel (Ni)	2021/07/20	0.58		%	20
			Dissolved Phosphorus (P)	2021/07/20	NC		%	20
			Dissolved Selenium (Se)	2021/07/20	12		%	20
			Dissolved Silicon (Si)	2021/07/20	0.16		%	20
			Dissolved Silver (Ag)	2021/07/20	NC		%	20
			Dissolved Strontium (Sr)	2021/07/20	0.20		%	20
			Dissolved Thallium (Tl)	2021/07/20	12		%	20
			Dissolved Tin (Sn)	2021/07/20	NC		%	20
			Dissolved Titanium (Ti)	2021/07/20	NC		%	20
			Dissolved Uranium (U)	2021/07/20	1.1		%	20
			Dissolved Vanadium (V)	2021/07/20	NC		%	20
			Dissolved Zinc (Zn)	2021/07/20	0.75		%	20
			Dissolved Zirconium (Zr)	2021/07/20	NC		%	20
A290604	AA1	RPD [ABX588-06]	Dissolved Aluminum (Al)	2021/07/20	12		%	20
			Dissolved Antimony (Sb)	2021/07/20	NC		%	20

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Arsenic (As)	2021/07/20	NC		%	20
			Dissolved Barium (Ba)	2021/07/20	NC		%	20
			Dissolved Beryllium (Be)	2021/07/20	NC		%	20
			Dissolved Bismuth (Bi)	2021/07/20	NC		%	20
			Dissolved Boron (B)	2021/07/20	NC		%	20
			Dissolved Cadmium (Cd)	2021/07/20	NC		%	20
			Dissolved Chromium (Cr)	2021/07/20	NC		%	20
			Dissolved Cobalt (Co)	2021/07/20	NC		%	20
			Dissolved Copper (Cu)	2021/07/20	NC		%	20
			Dissolved Iron (Fe)	2021/07/20	NC		%	20
			Dissolved Lead (Pb)	2021/07/20	NC		%	20
			Dissolved Lithium (Li)	2021/07/20	NC		%	20
			Dissolved Manganese (Mn)	2021/07/20	NC		%	20
			Dissolved Molybdenum (Mo)	2021/07/20	NC		%	20
			Dissolved Nickel (Ni)	2021/07/20	NC		%	20
			Dissolved Phosphorus (P)	2021/07/20	NC		%	20
			Dissolved Selenium (Se)	2021/07/20	NC		%	20
			Dissolved Silicon (Si)	2021/07/20	NC		%	20
			Dissolved Silver (Ag)	2021/07/20	NC		%	20
			Dissolved Strontium (Sr)	2021/07/20	NC		%	20
			Dissolved Thallium (Tl)	2021/07/20	NC		%	20
			Dissolved Tin (Sn)	2021/07/20	NC		%	20
			Dissolved Titanium (Ti)	2021/07/20	NC		%	20
			Dissolved Uranium (U)	2021/07/20	NC		%	20
			Dissolved Vanadium (V)	2021/07/20	NC		%	20
			Dissolved Zinc (Zn)	2021/07/20	NC		%	20
			Dissolved Zirconium (Zr)	2021/07/20	NC		%	20
A290685	CJY	Matrix Spike	Total Mercury (Hg)	2021/07/19		72 (1)	%	80 - 120
A290685	CJY	Spiked Blank	Total Mercury (Hg)	2021/07/19		89	%	80 - 120
A290685	CJY	Method Blank	Total Mercury (Hg)	2021/07/19	<0.0019		ug/L	
A290685	CJY	RPD	Total Mercury (Hg)	2021/07/19	NC		%	20
A290697	TMU	Matrix Spike	Strong Acid Dissoc. Cyanide (CN)	2021/07/20		99	%	80 - 120
A290697	TMU	Spiked Blank	Strong Acid Dissoc. Cyanide (CN)	2021/07/20		96	%	80 - 120
A290697	TMU	Method Blank	Strong Acid Dissoc. Cyanide (CN)	2021/07/20	<0.00050		mg/L	
A290697	TMU	RPD	Strong Acid Dissoc. Cyanide (CN)	2021/07/20	NC		%	20
A290700	TMU	Matrix Spike	Weak Acid Dissoc. Cyanide (CN)	2021/07/20		97	%	80 - 120
A290700	TMU	Spiked Blank	Weak Acid Dissoc. Cyanide (CN)	2021/07/20		98	%	80 - 120
A290700	TMU	Method Blank	Weak Acid Dissoc. Cyanide (CN)	2021/07/20	<0.00050		mg/L	
A290700	TMU	RPD	Weak Acid Dissoc. Cyanide (CN)	2021/07/20	11		%	20
A290755	WZ1	Matrix Spike	Total Suspended Solids	2021/07/20		102	%	80 - 120
A290755	WZ1	Spiked Blank	Total Suspended Solids	2021/07/20		95	%	80 - 120
A290755	WZ1	Method Blank	Total Suspended Solids	2021/07/20	<1.0		mg/L	
A290755	WZ1	RPD	Total Suspended Solids	2021/07/20	NC		%	20
A291082	MO5	Matrix Spike [ABX585-02]	Dissolved Chloride (Cl)	2021/07/20		102	%	80 - 120
			Dissolved Sulphate (SO4)	2021/07/20		NC	%	80 - 120
A291082	MO5	Spiked Blank	Dissolved Chloride (Cl)	2021/07/20		102	%	80 - 120
			Dissolved Sulphate (SO4)	2021/07/20		99	%	80 - 120
A291082	MO5	Method Blank	Dissolved Chloride (Cl)	2021/07/20	<0.50		mg/L	
			Dissolved Sulphate (SO4)	2021/07/20	0.67, RDL=0.50		mg/L	
A291082	MO5	RPD [ABX585-02]	Dissolved Chloride (Cl)	2021/07/20	10		%	20
			Dissolved Sulphate (SO4)	2021/07/20	4.3		%	20
A291083	MO5	Matrix Spike [ABX357-02]	Dissolved Chloride (Cl)	2021/07/20		101	%	80 - 120
			Dissolved Sulphate (SO4)	2021/07/20		NC	%	80 - 120
A291083	MO5	Spiked Blank	Dissolved Chloride (Cl)	2021/07/20		102	%	80 - 120

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Sulphate (SO4)	2021/07/20		103	%	80 - 120
A291083	MO5	Method Blank	Dissolved Chloride (Cl)	2021/07/20	<0.50		mg/L	
			Dissolved Sulphate (SO4)	2021/07/20	0.90, RDL=0.50		mg/L	
A291083	MO5	RPD [ABX357-02]	Dissolved Chloride (Cl)	2021/07/20	NC		%	20
			Dissolved Sulphate (SO4)	2021/07/20	3.5		%	20
A291762	AA1	Matrix Spike	Total Aluminum (Al)	2021/07/20		138 (1)	%	80 - 120
			Total Antimony (Sb)	2021/07/20		105	%	80 - 120
			Total Arsenic (As)	2021/07/20		104	%	80 - 120
			Total Barium (Ba)	2021/07/20		103	%	80 - 120
			Total Beryllium (Be)	2021/07/20		99	%	80 - 120
			Total Bismuth (Bi)	2021/07/20		99	%	80 - 120
			Total Boron (B)	2021/07/20		100	%	80 - 120
			Total Cadmium (Cd)	2021/07/20		104	%	80 - 120
			Total Chromium (Cr)	2021/07/20		100	%	80 - 120
			Total Cobalt (Co)	2021/07/20		99	%	80 - 120
			Total Copper (Cu)	2021/07/20		102	%	80 - 120
			Total Iron (Fe)	2021/07/20		NC	%	80 - 120
			Total Lead (Pb)	2021/07/20		102	%	80 - 120
			Total Lithium (Li)	2021/07/20		99	%	80 - 120
			Total Manganese (Mn)	2021/07/20		NC	%	80 - 120
			Total Molybdenum (Mo)	2021/07/20		110	%	80 - 120
			Total Nickel (Ni)	2021/07/20		97	%	80 - 120
			Total Phosphorus (P)	2021/07/20		104	%	80 - 120
			Total Selenium (Se)	2021/07/20		106	%	80 - 120
			Total Silicon (Si)	2021/07/20		NC	%	80 - 120
			Total Silver (Ag)	2021/07/20		103	%	80 - 120
			Total Strontium (Sr)	2021/07/20		NC	%	80 - 120
			Total Thallium (Tl)	2021/07/20		102	%	80 - 120
			Total Tin (Sn)	2021/07/20		104	%	80 - 120
			Total Titanium (Ti)	2021/07/20		124 (1)	%	80 - 120
			Total Uranium (U)	2021/07/20		107	%	80 - 120
			Total Vanadium (V)	2021/07/20		103	%	80 - 120
			Total Zinc (Zn)	2021/07/20		88	%	80 - 120
			Total Zirconium (Zr)	2021/07/20		111	%	80 - 120
A291762	AA1	Spiked Blank	Total Aluminum (Al)	2021/07/20		102	%	80 - 120
			Total Antimony (Sb)	2021/07/20		105	%	80 - 120
			Total Arsenic (As)	2021/07/20		102	%	80 - 120
			Total Barium (Ba)	2021/07/20		100	%	80 - 120
			Total Beryllium (Be)	2021/07/20		101	%	80 - 120
			Total Bismuth (Bi)	2021/07/20		99	%	80 - 120
			Total Boron (B)	2021/07/20		101	%	80 - 120
			Total Cadmium (Cd)	2021/07/20		105	%	80 - 120
			Total Chromium (Cr)	2021/07/20		99	%	80 - 120
			Total Cobalt (Co)	2021/07/20		100	%	80 - 120
			Total Copper (Cu)	2021/07/20		101	%	80 - 120
			Total Iron (Fe)	2021/07/20		103	%	80 - 120
			Total Lead (Pb)	2021/07/20		101	%	80 - 120
			Total Lithium (Li)	2021/07/20		104	%	80 - 120
			Total Manganese (Mn)	2021/07/20		99	%	80 - 120
			Total Molybdenum (Mo)	2021/07/20		104	%	80 - 120
			Total Nickel (Ni)	2021/07/20		99	%	80 - 120
			Total Phosphorus (P)	2021/07/20		101	%	80 - 120
			Total Selenium (Se)	2021/07/20		104	%	80 - 120
			Total Silicon (Si)	2021/07/20		101	%	80 - 120

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Silver (Ag)	2021/07/20		104	%	80 - 120
			Total Strontium (Sr)	2021/07/20		103	%	80 - 120
			Total Thallium (Tl)	2021/07/20		102	%	80 - 120
			Total Tin (Sn)	2021/07/20		104	%	80 - 120
			Total Titanium (Ti)	2021/07/20		105	%	80 - 120
			Total Uranium (U)	2021/07/20		106	%	80 - 120
			Total Vanadium (V)	2021/07/20		101	%	80 - 120
			Total Zinc (Zn)	2021/07/20		101	%	80 - 120
			Total Zirconium (Zr)	2021/07/20		106	%	80 - 120
A291762	AA1	Method Blank	Total Aluminum (Al)	2021/07/21	<3.0		ug/L	
			Total Antimony (Sb)	2021/07/21	<0.020		ug/L	
			Total Arsenic (As)	2021/07/21	<0.020		ug/L	
			Total Barium (Ba)	2021/07/21	<0.050		ug/L	
			Total Beryllium (Be)	2021/07/21	<0.010		ug/L	
			Total Bismuth (Bi)	2021/07/21	<0.010		ug/L	
			Total Boron (B)	2021/07/21	<10		ug/L	
			Total Cadmium (Cd)	2021/07/21	<0.0050		ug/L	
			Total Chromium (Cr)	2021/07/21	<0.10		ug/L	
			Total Cobalt (Co)	2021/07/21	<0.010		ug/L	
			Total Copper (Cu)	2021/07/21	<0.10		ug/L	
			Total Iron (Fe)	2021/07/21	<5.0		ug/L	
			Total Lead (Pb)	2021/07/21	<0.020		ug/L	
			Total Lithium (Li)	2021/07/21	<0.50		ug/L	
			Total Manganese (Mn)	2021/07/21	<0.10		ug/L	
			Total Molybdenum (Mo)	2021/07/21	<0.050		ug/L	
			Total Nickel (Ni)	2021/07/21	<0.10		ug/L	
			Total Phosphorus (P)	2021/07/21	<5.0		ug/L	
			Total Selenium (Se)	2021/07/21	<0.040		ug/L	
			Total Silicon (Si)	2021/07/21	<50		ug/L	
			Total Silver (Ag)	2021/07/21	<0.010		ug/L	
			Total Strontium (Sr)	2021/07/21	<0.050		ug/L	
			Total Thallium (Tl)	2021/07/21	<0.0020		ug/L	
			Total Tin (Sn)	2021/07/21	<0.20		ug/L	
			Total Titanium (Ti)	2021/07/21	<2.0		ug/L	
			Total Uranium (U)	2021/07/21	<0.0050		ug/L	
			Total Vanadium (V)	2021/07/21	<0.20		ug/L	
			Total Zinc (Zn)	2021/07/21	<1.0		ug/L	
			Total Zirconium (Zr)	2021/07/21	<0.10		ug/L	
A291762	AA1	RPD	Total Aluminum (Al)	2021/07/21	19		%	20
			Total Antimony (Sb)	2021/07/21	9.8		%	20
			Total Arsenic (As)	2021/07/21	5.5		%	20
			Total Barium (Ba)	2021/07/21	0.57		%	20
			Total Beryllium (Be)	2021/07/21	NC		%	20
			Total Bismuth (Bi)	2021/07/21	NC		%	20
			Total Boron (B)	2021/07/21	NC		%	20
			Total Cadmium (Cd)	2021/07/21	NC		%	20
			Total Chromium (Cr)	2021/07/21	15		%	20
			Total Cobalt (Co)	2021/07/21	8.5		%	20
			Total Copper (Cu)	2021/07/21	5.6		%	20
			Total Iron (Fe)	2021/07/21	1.3		%	20
			Total Lead (Pb)	2021/07/21	16		%	20
			Total Lithium (Li)	2021/07/21	0.58		%	20
			Total Manganese (Mn)	2021/07/21	3.3		%	20
			Total Molybdenum (Mo)	2021/07/21	NC		%	20
			Total Nickel (Ni)	2021/07/21	8.4		%	20

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Phosphorus (P)	2021/07/21	9.4		%	20
			Total Selenium (Se)	2021/07/21	6.6		%	20
			Total Silicon (Si)	2021/07/21	3.7		%	20
			Total Silver (Ag)	2021/07/21	NC		%	20
			Total Strontium (Sr)	2021/07/21	0.036		%	20
			Total Thallium (Tl)	2021/07/21	NC		%	20
			Total Tin (Sn)	2021/07/21	NC		%	20
			Total Titanium (Ti)	2021/07/21	16		%	20
			Total Uranium (U)	2021/07/21	0.65		%	20
			Total Vanadium (V)	2021/07/21	12		%	20
			Total Zinc (Zn)	2021/07/21	1.5		%	20
			Total Zirconium (Zr)	2021/07/21	13		%	20
A291824	BTM	Matrix Spike	Total Suspended Solids	2021/07/21		101	%	80 - 120
A291824	BTM	Spiked Blank	Total Suspended Solids	2021/07/21		102	%	80 - 120
A291824	BTM	Method Blank	Total Suspended Solids	2021/07/21	<1.0		mg/L	
A291824	BTM	RPD	Total Suspended Solids	2021/07/21	NC		%	20
A291841	BTM	Matrix Spike	Total Suspended Solids	2021/07/21		102	%	80 - 120
A291841	BTM	Spiked Blank	Total Suspended Solids	2021/07/21		98	%	80 - 120
A291841	BTM	Method Blank	Total Suspended Solids	2021/07/21	<1.0		mg/L	
A291841	BTM	RPD	Total Suspended Solids	2021/07/21	3.3		%	20
A291874	KSO	Matrix Spike	Total Sulphide	2021/07/20		119	%	80 - 120
A291874	KSO	Spiked Blank	Total Sulphide	2021/07/20		119	%	80 - 120
A291874	KSO	Method Blank	Total Sulphide	2021/07/20	<0.0018		mg/L	
A291874	KSO	RPD	Total Sulphide	2021/07/20	3.0		%	20
A291896	KMG	Spiked Blank	pH (15 C)	2021/07/20		99	%	97 - 103
A291896	KMG	RPD	pH (15 C)	2021/07/20	0.13		%	N/A
A291920	KMG	Spiked Blank	pH (15 C)	2021/07/20		100	%	97 - 103
A291920	KMG	RPD [ABX354-03]	pH (15 C)	2021/07/20	0.40		%	N/A
A291994	JC8	Matrix Spike	Total Mercury (Hg)	2021/07/20		83	%	80 - 120
A291994	JC8	Spiked Blank	Total Mercury (Hg)	2021/07/20		96	%	80 - 120
A291994	JC8	Method Blank	Total Mercury (Hg)	2021/07/20	<0.0019		ug/L	
A291994	JC8	RPD	Total Mercury (Hg)	2021/07/20	NC		%	20
A292036	JC8	Matrix Spike [ABX358-07]	Total Mercury (Hg)	2021/07/20		78 (1)	%	80 - 120
A292036	JC8	Spiked Blank	Total Mercury (Hg)	2021/07/20		109	%	80 - 120
A292036	JC8	Method Blank	Total Mercury (Hg)	2021/07/20	<0.0019		ug/L	
A292036	JC8	RPD [ABX357-07]	Total Mercury (Hg)	2021/07/20	NC		%	20
A292082	BO3	Spiked Blank	pH	2021/07/19		102	%	97 - 103
A292082	BO3	RPD [ABX585-02]	pH	2021/07/19	1.3		%	N/A
A292082	BO3	RPD	pH	2021/07/19	0.40		%	N/A
A292084	BO3	Matrix Spike [ABX585-02]	Alkalinity (Total as CaCO3)	2021/07/19		NC	%	80 - 120
A292084	BO3	Spiked Blank	Alkalinity (Total as CaCO3)	2021/07/19		95	%	80 - 120
A292084	BO3	Method Blank	Alkalinity (PP as CaCO3)	2021/07/19	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2021/07/19	<1.0		mg/L	
			Bicarbonate (HCO3)	2021/07/19	<1.0		mg/L	
			Carbonate (CO3)	2021/07/19	<1.0		mg/L	
			Hydroxide (OH)	2021/07/19	<1.0		mg/L	
A292084	BO3	RPD [ABX585-02]	Alkalinity (PP as CaCO3)	2021/07/19	NC		%	20
			Alkalinity (Total as CaCO3)	2021/07/19	0.83		%	20
			Bicarbonate (HCO3)	2021/07/19	0.83		%	20
			Carbonate (CO3)	2021/07/19	NC		%	20
			Hydroxide (OH)	2021/07/19	NC		%	20
A292084	BO3	RPD	Alkalinity (PP as CaCO3)	2021/07/19	NC		%	20
			Alkalinity (Total as CaCO3)	2021/07/19	0.014		%	20
			Bicarbonate (HCO3)	2021/07/19	0.014		%	20
			Carbonate (CO3)	2021/07/19	NC		%	20

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Hydroxide (OH)	2021/07/19	NC		%	20
A292085	BO3	Spiked Blank	Conductivity	2021/07/19		97	%	80 - 120
A292085	BO3	Method Blank	Conductivity	2021/07/19	<2.0		uS/cm	
A292085	BO3	RPD [ABX585-02]	Conductivity	2021/07/19	0.28		%	10
A292085	BO3	RPD	Conductivity	2021/07/19	0.070		%	10
A292089	BO3	Spiked Blank	pH	2021/07/19		101	%	97 - 103
A292089	BO3	RPD [ABX357-02]	pH	2021/07/19	0.26		%	N/A
A292089	BO3	RPD	pH	2021/07/19	1.7		%	N/A
A292091	BO3	Matrix Spike	Alkalinity (Total as CaCO3)	2021/07/19		NC	%	80 - 120
A292091	BO3	Spiked Blank	Alkalinity (Total as CaCO3)	2021/07/19		95	%	80 - 120
A292091	BO3	Method Blank	Alkalinity (PP as CaCO3)	2021/07/19	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2021/07/19	<1.0		mg/L	
			Bicarbonate (HCO3)	2021/07/19	<1.0		mg/L	
			Carbonate (CO3)	2021/07/19	<1.0		mg/L	
			Hydroxide (OH)	2021/07/19	<1.0		mg/L	
A292091	BO3	RPD [ABX357-02]	Alkalinity (PP as CaCO3)	2021/07/19	NC		%	20
			Alkalinity (Total as CaCO3)	2021/07/19	1.2		%	20
			Bicarbonate (HCO3)	2021/07/19	1.2		%	20
			Carbonate (CO3)	2021/07/19	NC		%	20
			Hydroxide (OH)	2021/07/19	NC		%	20
A292091	BO3	RPD	Alkalinity (PP as CaCO3)	2021/07/19	NC		%	20
			Alkalinity (Total as CaCO3)	2021/07/19	0.82		%	20
			Bicarbonate (HCO3)	2021/07/19	0.82		%	20
			Carbonate (CO3)	2021/07/19	NC		%	20
			Hydroxide (OH)	2021/07/19	NC		%	20
A292092	BO3	Spiked Blank	Conductivity	2021/07/19		97	%	80 - 120
A292092	BO3	Method Blank	Conductivity	2021/07/19	<2.0		uS/cm	
A292092	BO3	RPD [ABX357-02]	Conductivity	2021/07/19	0.84		%	10
A292092	BO3	RPD	Conductivity	2021/07/19	0.68		%	10
A292143	JM0	Matrix Spike	Total Dissolved Solids	2021/07/21		110	%	80 - 120
A292143	JM0	Spiked Blank	Total Dissolved Solids	2021/07/21		84	%	80 - 120
A292143	JM0	Method Blank	Total Dissolved Solids	2021/07/21	<1.0		mg/L	
A292143	JM0	RPD	Total Dissolved Solids	2021/07/21	4.5		%	20
A292164	JC8	Matrix Spike	Dissolved Mercury (Hg)	2021/07/20		95	%	80 - 120
A292164	JC8	Spiked Blank	Dissolved Mercury (Hg)	2021/07/20		99	%	80 - 120
A292164	JC8	Method Blank	Dissolved Mercury (Hg)	2021/07/20	<0.0019		ug/L	
A292164	JC8	RPD	Dissolved Mercury (Hg)	2021/07/20	13		%	20
A292230	BYM	Matrix Spike	Total Sulphide	2021/07/21		102	%	80 - 120
A292230	BYM	Spiked Blank	Total Sulphide	2021/07/21		100	%	80 - 120
A292230	BYM	Method Blank	Total Sulphide	2021/07/21	<0.0018		mg/L	
A292230	BYM	RPD	Total Sulphide	2021/07/21	8.0		%	20
A292468	LDH	Matrix Spike [ABX350-09]	Total Nitrogen (N)	2021/07/21		NC	%	80 - 120
A292468	LDH	Spiked Blank	Total Nitrogen (N)	2021/07/21		98	%	80 - 120
A292468	LDH	Method Blank	Total Nitrogen (N)	2021/07/21	<0.020		mg/L	
A292468	LDH	RPD [ABX350-09]	Total Nitrogen (N)	2021/07/21	1.3		%	20
A292472	LDH	Matrix Spike	Total Nitrogen (N)	2021/07/21		NC	%	80 - 120
A292472	LDH	Spiked Blank	Total Nitrogen (N)	2021/07/21		100	%	80 - 120
A292472	LDH	Method Blank	Total Nitrogen (N)	2021/07/21	<0.020		mg/L	
A292472	LDH	RPD	Total Nitrogen (N)	2021/07/21	0.47		%	20
A292484	LDH	Matrix Spike	Total Nitrogen (N)	2021/07/21		-93 (1)	%	80 - 120
A292484	LDH	Spiked Blank	Total Nitrogen (N)	2021/07/21		99	%	80 - 120
A292484	LDH	Method Blank	Total Nitrogen (N)	2021/07/21	<0.020		mg/L	
A292997	TMU	Matrix Spike [ABX356-11]	Strong Acid Dissoc. Cyanide (CN)	2021/07/21		116	%	80 - 120
A292997	TMU	Spiked Blank	Strong Acid Dissoc. Cyanide (CN)	2021/07/21		110	%	80 - 120
A292997	TMU	Method Blank	Strong Acid Dissoc. Cyanide (CN)	2021/07/21	<0.00050		mg/L	

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A292997	TMU	RPD [ABX356-11]	Strong Acid Dissoc. Cyanide (CN)	2021/07/21	NC		%	20
A293007	TMU	Matrix Spike [ABX356-11]	Weak Acid Dissoc. Cyanide (CN)	2021/07/21		99	%	80 - 120
A293007	TMU	Spiked Blank	Weak Acid Dissoc. Cyanide (CN)	2021/07/21		99	%	80 - 120
A293007	TMU	Method Blank	Weak Acid Dissoc. Cyanide (CN)	2021/07/21	<0.00050		mg/L	
A293007	TMU	RPD [ABX356-11]	Weak Acid Dissoc. Cyanide (CN)	2021/07/21	NC		%	20
A293012	TMU	Matrix Spike [ABX586-11]	Strong Acid Dissoc. Cyanide (CN)	2021/07/21		104	%	80 - 120
A293012	TMU	Spiked Blank	Strong Acid Dissoc. Cyanide (CN)	2021/07/21		112	%	80 - 120
A293012	TMU	Method Blank	Strong Acid Dissoc. Cyanide (CN)	2021/07/21	<0.00050		mg/L	
A293012	TMU	RPD [ABX586-11]	Strong Acid Dissoc. Cyanide (CN)	2021/07/21	0		%	20
A293013	TMU	Matrix Spike [ABX586-11]	Weak Acid Dissoc. Cyanide (CN)	2021/07/21		96	%	80 - 120
A293013	TMU	Spiked Blank	Weak Acid Dissoc. Cyanide (CN)	2021/07/21		94	%	80 - 120
A293013	TMU	Method Blank	Weak Acid Dissoc. Cyanide (CN)	2021/07/21	<0.00050		mg/L	
A293013	TMU	RPD [ABX586-11]	Weak Acid Dissoc. Cyanide (CN)	2021/07/21	NC		%	20
A293243	SKM	Matrix Spike [ABX588-09]	Total Ammonia (N)	2021/07/21		104	%	80 - 120
A293243	SKM	Spiked Blank	Total Ammonia (N)	2021/07/21		102	%	80 - 120
A293243	SKM	Method Blank	Total Ammonia (N)	2021/07/21	<0.0050		mg/L	
A293243	SKM	RPD [ABX588-09]	Total Ammonia (N)	2021/07/21	NC		%	20
A293247	SKM	Matrix Spike [ABX589-09]	Total Ammonia (N)	2021/07/21		102	%	80 - 120
A293247	SKM	Spiked Blank	Total Ammonia (N)	2021/07/21		101	%	80 - 120
A293247	SKM	Method Blank	Total Ammonia (N)	2021/07/21	<0.0050		mg/L	
A293247	SKM	RPD [ABX589-09]	Total Ammonia (N)	2021/07/21	NC		%	20
A293318	BTM	Matrix Spike	Total Suspended Solids	2021/07/22		103	%	80 - 120
A293318	BTM	Spiked Blank	Total Suspended Solids	2021/07/22		103	%	80 - 120
A293318	BTM	Method Blank	Total Suspended Solids	2021/07/22	<1.0		mg/L	
A293318	BTM	RPD	Total Suspended Solids	2021/07/22	NC		%	20
A293321	BTM	Matrix Spike [ABX589-01]	Total Suspended Solids	2021/07/22		107	%	80 - 120
A293321	BTM	Spiked Blank	Total Suspended Solids	2021/07/22		101	%	80 - 120
A293321	BTM	Method Blank	Total Suspended Solids	2021/07/22	<1.0		mg/L	
A293321	BTM	RPD [ABX588-01]	Total Suspended Solids	2021/07/22	NC		%	20
A294868	ZWU	Matrix Spike [ABX352-10]	Dissolved Organic Carbon (C)	2021/07/23		106	%	80 - 120
A294868	ZWU	Spiked Blank	Dissolved Organic Carbon (C)	2021/07/23		113	%	80 - 120
A294868	ZWU	Method Blank	Dissolved Organic Carbon (C)	2021/07/23	<0.20		mg/L	
A294868	ZWU	RPD [ABX352-10]	Dissolved Organic Carbon (C)	2021/07/23	4.6		%	20
A294905	ZWU	Matrix Spike [ABX354-10]	Dissolved Organic Carbon (C)	2021/07/23		NC	%	80 - 120
A294905	ZWU	Spiked Blank	Dissolved Organic Carbon (C)	2021/07/23		116	%	80 - 120
A294905	ZWU	Method Blank	Dissolved Organic Carbon (C)	2021/07/23	<0.20		mg/L	
A294905	ZWU	RPD [ABX354-10]	Dissolved Organic Carbon (C)	2021/07/23	9.2		%	20

N/A = Not Applicable

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

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

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

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

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

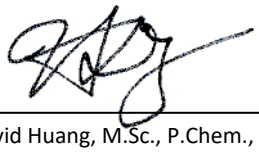
NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

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

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

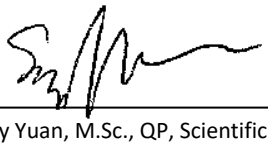
VALIDATION SIGNATURE PAGE

The analytical data and all QC contained in this report were reviewed and validated by:



David Huang, M.Sc., P.Chem., QP, Scientific Services Manager

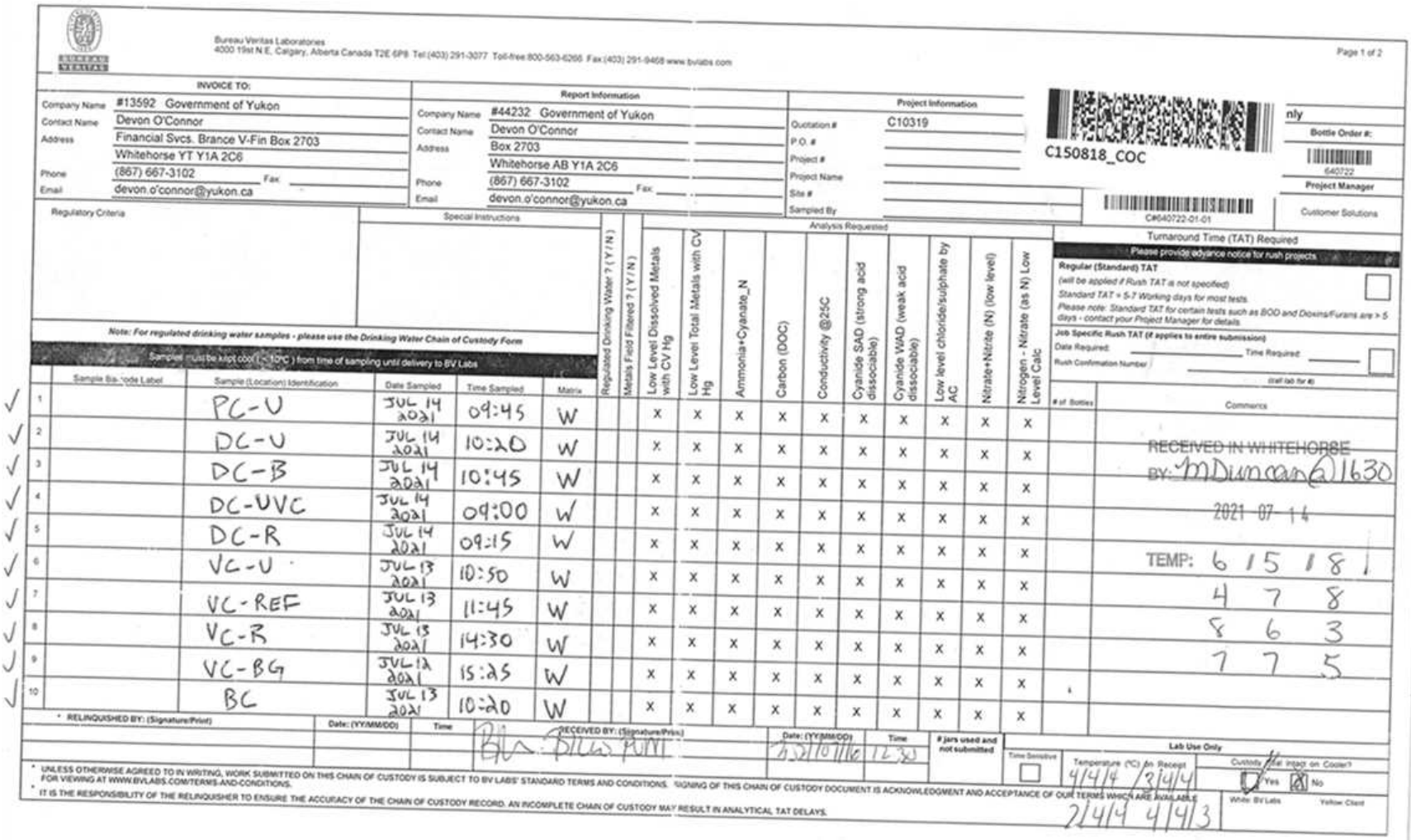
Maria Magdalena Florescu, Ph.D., P.Chem., QP, Inorganics Manager



Sandy Yuan, M.Sc., QP, Scientific Specialist

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386



Bureau Veritas Laboratories
4000 19st N.E, Calgary, Alberta Canada T2E 6P8 Tel:(403) 291-3077 Toll-free:800-563-6266 Fax:(403) 291-9468 www.bvlabs.com

Page 1 of 2

C150818_COC

INVOICE TO:
Company Name: #13592 Government of Yukon
Contact Name: Devon O'Connor
Address: Financial Svcs. Brance V-Fin Box 2703, Whitehorse YT Y1A 2C6
Phone: (867) 667-3102 Fax:
Email: devon.o'connor@yukon.ca

Report Information
Company Name: #44232 Government of Yukon
Contact Name: Devon O'Connor
Address: Box 2703, Whitehorse AB Y1A 2C6
Phone: (867) 667-3102 Fax:
Email: devon.o'connor@yukon.ca

Project Information
Quotation #: C10319
P.O. #:
Project #:
Project Name:
Site #:
Sampled By:

C#640722-01-01

nly
Bottle Order #: 640722
Project Manager
Customer Solutions

Regulatory Criteria

Special Instructions

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to BV Labs

Analysis Requested

Turnaround Time (TAT) Required
Please provide advance notice for rush projects
Regular (Standard) TAT
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.
Job Specific Rush TAT (if applies to entire submission)
Date Required: Time Required:
Rush Confirmation Number: (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	Low Level Dissolved Metals with CV Hg	Low Level Total Metals with CV Hg	Ammonia+Cyanate_N	Carbon (DOC)	Conductivity @25C	Cyanide SAD (strong acid dissociable)	Cyanide WAD (weak acid dissociable)	Low level chloride/sulphate by AC	Nitrate+Nitrite (N) (low level)	Nitrogen - Nitrate (as N) Low Level Calc	# of Bottles	Comments
✓ 1		PC-U	JUL 14 2021	09:45	W			X	X	X	X	X	X	X	X	X	X		RECEIVED IN WHITEHORSE BY: mDuncan @ 1630 2021 07 14
✓ 2		DC-U	JUL 14 2021	10:20	W			X	X	X	X	X	X	X	X	X	X		
✓ 3		DC-B	JUL 14 2021	10:45	W			X	X	X	X	X	X	X	X	X	X		
✓ 4		DC-UVC	JUL 14 2021	09:00	W			X	X	X	X	X	X	X	X	X	X		
✓ 5		DC-R	JUL 14 2021	09:15	W			X	X	X	X	X	X	X	X	X	X		
✓ 6		VC-U	JUL 13 2021	10:50	W			X	X	X	X	X	X	X	X	X	X		TEMP: 6 15 18 1
✓ 7		VC-REF	JUL 13 2021	11:45	W			X	X	X	X	X	X	X	X	X	X		4 7 8
✓ 8		VC-R	JUL 13 2021	14:30	W			X	X	X	X	X	X	X	X	X	X		8 6 3
✓ 9		VC-BG	JUL 12 2021	15:25	W			X	X	X	X	X	X	X	X	X	X		7 7 5
✓ 10		BC	JUL 13 2021	10:20	W			X	X	X	X	X	X	X	X	X	X		

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
			Billie Point	21/07/16	12:30	

Lab Use Only
Time Sensitive: ☐
Temperature (°C) on Receipt: 4/4/4 / 3/4/4
Custody seal intact on Cooler? ☐ Yes ☒ No
2/4/4 4/4/3

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.
* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: BV Labs Yellow: Client

Bureau Veritas Canada (2019) Inc.

Bureau Veritas Laboratories
4000 19st N.E. Calgary, Alberta Canada T2E 6P8 Tel:(403) 291-3077 Toll-free 800-563-6266 Fax:(403) 291-9468 www.bvlabs.com

C150818_COC

Only

Bottle Order #: 640722

INVOICE TO:		Report Information		Project Information	
Company Name	#13592 Government of Yukon	Company Name	#44232 Government of Yukon	Quotation #	C10319
Contact Name	Devon O'Connor	Contact Name	Devon O'Connor	P.O. #	
Address	Financial Svcs. Brance V-Fin Box 2703	Address	Box 2703	Project #	
	Whitehorse YT Y1A 2C6		Whitehorse AB Y1A 2C6	Project Name	
Phone	(867) 667-3102 Fax:	Phone	(867) 667-3102 Fax:	Site #	
Email	devon.o'connor@yukon.ca	Email	devon.o'connor@yukon.ca	Sampled By	

Chain Of Custody Record	Project Manager
C#640722-01-02	Customer Solutions

Regulatory Criteria

Special Instructions

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT ☐
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission) ☐
Date Required: ________ Time Required: ________
Rush Confirmation Number ________ (call lab for #)

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to BV Labs

Analysis Requested

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	Nitrogen (Total)	pH @25°C	Total Dissolved Solids - Low Level	Total Sulphide	Total Suspended Solids (NFR)	Un-ionized Ammonia as N @ 15 C	Alkalinity @25C (pp, total), CO3,HCO3,OH	Total Suspended Solids(Fixed & Volatile)			# of Bottles	Comments
✓ 1		PC-U	JUL 14 2021	09:45	W			X	X	X	X	X	X	X					
✓ 2		DC-U	JUL 14 2021	10:20	W			X	X	X	X	X	X	X					RECEIVED IN WHITEHORSE
✓ 3		DC-B	JUL 14 2021	10:45	W			X	X	X	X	X	X	X					BY: mDuncan @1630
✓ 4		DC-UVC	JUL 14 2021	09:00	W			X	X	X	X	X	X	X					2021-07-14
✓ 5		DC-R	JUL 14 2021	09:15	W			X	X	X	X	X	X	X					TEMP: 6 1 5 8
✓ 6		VC-U	JUL 13 2021	10:50	W			X	X	X	X	X	X	X					4 7 8
✓ 7		VC-~~BEF~~ REF	JUL 13 2021	11:45	W			X	X	X	X	X	X	X					8 6 3
✓ 8		VC-R	JUL 13 2021	14:30	W			X	X	X	X	X	X	X					7 7 5
✓ 9		VC-BG	JUL 12 2021	15:25	W			X	X	X	X	X	X	X					
✓ 10		BC	JUL 13 2021	10:20	W			X	X	X	X	X	X	X					

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted
			BW BCW PWI	2021/07/16	1230	

Lab Use Only		
Time Sensitive ☐	Temperature (°C) on Receipt: 4/4/4 3/4/4 2/4/4 4/4/3	Custody Seal Intact on Cooler? ☑ Yes ☐ No

White: BV Labs Yellow: Client

Bureau Veritas Laboratories
4000 19st N.E. Calgary, Alberta Canada T2E 6P8 Tel:(403) 291-3077 Toll-free 800-563-6266 Fax:(403) 291-9468 www.bvlabs.com

Page of

C150818_COC

INVOICE TO:		Report Information		Project Information	
Company Name	#13592 Government of Yukon	Company Name	#44232 Government of Yukon	Quotation #	C10319
Contact Name	Devon O'Connor	Contact Name	Devon O'Connor	P.O. #	
Address	Financial Svcs. Brance V-Fin Box 2703	Address	Box 2703	Project #	
	Whitehorse YT Y1A 2C6		Whitehorse AB Y1A 2C6	Project Name	
Phone	(867) 667-3102 Fax:	Phone	(867) 667-3102 Fax:	Site #	
Email	devon.o'connor@yukon.ca	Email	devon.o'connor@yukon.ca	Sampled By	

e Order #: 40722

Chain Of Custody Record — C#640722-02-01

Project Manager: Customer Solutions

Regulatory Criteria

Special Instructions

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to BV Labs

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: Time Required:
Rush Confirmation Number: (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	Low Level Dissolved Metals with CV Hg	Low Level Total Metals with CV Hg	Ammonia+Cyanate_N	Carbon (DOC)	Conductivity @25C	Cyanide SAD (strong acid dissociable)	Cyanide WAD (weak acid dissociable)	Low level chloride/sulphate by AC	Nitrate+Nitrite (N) (low level)	Nitrogen - Nitrate (as N) Low Level Calc	# of Bottles	Comments
✓ 1		BC-R	JUL 13 2021	10:15	W			X	X	X	X	X	X	X	X	X	X		
✓ 2		MN	JUL 13 2021	15:05	W			X	X	X	X	X	X	X	X	X	X		
3								X	X	X	X	X	X	X	X	X	X		
4								X	X	X	X	X	X	X	X	X	X		
5								X	X	X	X	X	X	X	X	X	X		
6								X	X	X	X	X	X	X	X	X	X		
7								X	X	X	X	X	X	X	X	X	X		
8								X	X	X	X	X	X	X	X	X	X		
9								X	X	X	X	X	X	X	X	X	X		
10								X	X	X	X	X	X	X	X	X	X		

RECEIVED IN WHITEHORSE
BY: mDuncan @ 1630
2021-07-14

TEMP: 6 1 5 1 8
4 7 8
8 6 3
7 7 5

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only
				2021/07/14	1230		Time Sensitive ☐ Temperature (°C) on receipt: 4/4/4/3/4/4 Custody Seal Intact on Cooler? ☑ Yes ☐ No

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.
* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

2/4/4/4/4/3

White: BV Labs Yellow: Client

Bureau Veritas Laboratories
4000 19st N.E. Calgary, Alberta Canada T2E 6P8 Tel (403) 291-3077 Toll-free 800-563-6266 Fax (403) 291-9468 www.bvlabs.com

Chain Of Custody Record

Page of

INVOICE TO:		Report Information		Project Information	
Company Name	#13592 Government of Yukon	Company Name	#44232 Government of Yukon	Quotation #	C10319
Contact Name	Devon O'Connor	Contact Name	Devon O'Connor	P.O. #	
Address	Financial Svcs. Brance V-Fin Box 2703	Address	Box 2703	Project #	
	Whitehorse YT Y1A 2C6		Whitehorse AB Y1A 2C6	Project Name	
Phone	(867) 667-3102 Fax:	Phone	(867) 667-3102 Fax:	Site #	
Email	devon.o'connor@yukon.ca	Email	devon.o'connor@yukon.ca	Sampled By	

Laboratory Use Only

BV Labs Job #	Bottle Order #:
C150818	640722
Chain Of Custody Record	Project Manager
C#640722-02-02	Customer Solutions

Regulatory Criteria

Special Instructions

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to BV Labs

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT ☐
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details

Job Specific Rush TAT (if applies to entire submission)
Date Required: ____ Time Required: ____ ☐
Rush Confirmation Number ____ (call lab for #)

Analysis Requested

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	Nitrogen (Total)	pH @25°C	Total Dissolved Solids - Low Level	Total Sulphide	Total Suspended Solids (NFR)	Un-ionized Ammonia as N @ 15 C	Alkalinity @25C (pp, total), CO3,HCO3,OH	Total Suspended Solids(Fixed & Volatile)			# of Bottles	Comments
1		BC-R	JUL 13 2021	10:15	W			X	X	X	X	X	X	X					RECEIVED IN WHITEHORSE
2		MN	JUL 12 2021	15:05	W			X	X	X	X	X	X	X					BY:
3								X	X	X	X	X	X	X					2021-07-14
4								X	X	X	X	X	X	X					
5								X	X	X	X	X	X	X					TEMP: 6 / 5 / 8
6								X	X	X	X	X	X	X					4 7 8
7								X	X	X	X	X	X	X					8 6 3
8								X	X	X	X	X	X	X					7 7 5
9								X	X	X	X	X	X	X					
10								X	X	X	X	X	X	X					

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only		
			[illegible]	2021/07/16	12:30		Time Sensitive ☐	Temperature (°C) on Receipt: 4/4/4 3/4/4 2/4/4 4/4/3	Custody Seal Intact on Cooler? ☑ Yes ☐ No

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: BV Labs Yellow: Client

Bureau Veritas Laboratories
4000 19st N.E. Calgary, Alberta Canada T2E 6P8 Tel (403) 291-3077 Toll-free 800-563-6266 Fax (403) 291-9468 www.bvlabs.com

Page of

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information	
Company Name	#13592 Government of Yukon	Company Name	#44232 Government of Yukon	Quotation #	C10319
Contact Name	Devon O'Connor	Contact Name	Devon O'Connor	P.O. #	
Address	Financial Svcs. Brance V-Fin Box 2703	Address	Box 2703	Project #	
	Whitehorse YT Y1A 2C6		Whitehorse AB Y1A 2C6	Project Name	
Phone	(867) 667-3102 Fax:	Phone	(867) 667-3102 Fax:	Site #	
Email	devon.o'connor@yukon.ca	Email	devon.o'connor@yukon.ca	Sampled By	

Laboratory Use Only

C150818	Bottle Order #: 640722
Chain Of Custody Record	Project Manager
C#640722-03-02	Customer Solutions

Regulatory Criteria

Special Instructions

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to BV Labs

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: Time Required:
Rush Confirmation Number: (call lab for #)

Analysis Requested

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	Nitrogen (Total)	pH @25°C	Total Dissolved Solids - Low Level	Total Sulphide	Total Suspended Solids (NFR)	Un-ionized Ammonia as N @ 15 C	Alkalinity @25C (pp, total), CO3,HCO3,OH	Total Suspended Solids(Fixed & Volatile)			# of Bottles	Comments
1								X	X	X	X	X	X	X					
2								X	X	X	X	X	X	X					
√ 3		FIELD BLANK	JUL 14 2021	11:15	W			X	X	X	X	X	X	X					
√ 4		TRIP BLANK						X	X	X	X	X	X	X					
5																			
6																			
7																			
8																			
9																			
10																			

RECEIVED IN WHITEHORSE
BY: MDunn@1630
2021-07-14

TEMP: 6 15 18
4 7 8
8 6 3
7 7 5

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Time Sensitive	Lab Use Only: Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
			Bn Blln Pum	2021/07/16	12:50		☐	4/4/4 3/4/4 2/4/4 4/4/3	☒ Yes ☐ No

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: BV Labs Yellow: Client

Bureau Veritas Laboratories
4000 19st N E, Calgary, Alberta Canada T2E 6P8 Tel (403) 291-3077 Toll-free 800-563-6266 Fax (403) 291-9468 www.bvlabs.com

Page of

INVOICE TO:		Report Information		Project Information		Lab Use Only
Company Name	#13592 Government of Yukon	Company Name	#44232 Government of Yukon	Quotation #	C10319	Bottle Order #:
Contact Name	Devon O'Connor	Contact Name	Devon O'Connor	P.O. #		640722
Address	Financial Svcs. Brance V-Fin Box 2703	Address	Box 2703	Project #		Project Manager
	Whitehorse YT Y1A 2C6		Whitehorse AB Y1A 2C6	Project Name		Customer Solutions
Phone	(867) 667-3102 Fax	Phone	(867) 667-3102 Fax	Site #		
Email	devon.o'connor@yukon.ca	Email	devon.o'connor@yukon.ca	Sampled By		

CISD818

Chain Of Custody Record

C#640722-03-01

Regulatory Criteria

Special Instructions

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to BV Labs

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: Time Required:
Rush Confirmation Number: (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	Low Level Dissolved Metals with CV Hg	Low Level Total Metals with CV Hg	Ammonia+Cyanate_N	Carbon (DOC)	Conductivity @25C	Cyanide SAD (strong acid dissociable)	Cyanide WAD (weak acid dissociable)	Low level chloride/sulphate by AC	Nitrate+Nitrite (N) (low level)	Nitrogen - Nitrate (as N) Low Level Calc	# of Bottles	Comments
1								X	X	X	X	X	X	X	X	X	X		
2								X	X	X	X	X	X	X	X	X	X		RECEIVED IN WHITEHORSE
3		FIELD BLANK	JUL 14 2021	11:15	W			X	X	X	X	X	X	X	X	X	X		BY: YT Duncan @ 1630
4		TRIP BLANK						X	X	X	X	X	X	X	X	X	X		2021-07-14
5																			
6																			TEMP: 6 1 5 1 8
7																			4 7 8
8																			8 6 3
9																			7 7 5
10																			

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only
			BILLS POM	21/07/14	16:30		Time Sensitive ☐ Temperature (°C) on Receipt 4/4/4/3/4/4 Custody Seal Intact on Cooler? ☒ Yes ☐ No

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

2/4/4/4/4/3

White: BV Labs Yellow: Client

Bureau Veritas Canada (2019) Inc.

Your C.O.C. #: 640722-01-01

Attention: Devon O'Connor

Government of Yukon
Box 2703
Whitehorse, AB
Canada Y1A 2C6

Report Date: 2021/07/30
Report #: R3052798
Version: 2 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C150922
Received: 2021/07/15, 12:30

Sample Matrix: Water
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Alkalinity @25C (pp, total), CO3,HCO3,OH	8	N/A	2021/07/19	BBY6SOP-00026	SM 23 2320 B m
Low level chloride/sulphate by AC	8	N/A	2021/07/20	BBY6SOP-00011 / BBY6SOP-00017	SM23-4500-Cl/SO4-E m
Cyanide SAD (strong acid dissociable) (1)	1	N/A	2021/07/20	CAL SOP-00270	SM 23 4500-CN m
Cyanide SAD (strong acid dissociable) (1)	7	N/A	2021/07/21	CAL SOP-00270	SM 23 4500-CN m
Cyanide WAD (weak acid dissociable) (1)	1	N/A	2021/07/20	CAL SOP-00270	SM 23 4500-CN m
Cyanide WAD (weak acid dissociable) (1)	7	N/A	2021/07/21	CAL SOP-00270	SM 23 4500-CN m
Cyanate Calculation	8	N/A	2021/07/30	BBY WI-00033	Auto Calc
Carbon (DOC) (1, 3)	8	N/A	2021/07/24	AB SOP-00087	MMCW 119 1996 m
Conductivity @25C	8	N/A	2021/07/19	BBY6SOP-00026	SM 23 2510 B m
Sulphide (as H2S) (1)	8	N/A	2021/07/21		Auto Calc
Hardness Total (calculated as CaCO3) (4)	4	N/A	2021/07/20	BBY WI-00033	Auto Calc
Hardness Total (calculated as CaCO3) (4)	4	N/A	2021/07/21	BBY WI-00033	Auto Calc
Hardness (calculated as CaCO3)	8	N/A	2021/07/20	BBY WI-00033	Auto Calc
Mercury (Dissolved) by CV (5)	8	2021/07/20	2021/07/20	AB SOP-00084	BCMOE BCLM Oct2013 m
Mercury (Total) by CV	8	2021/07/20	2021/07/20	AB SOP-00084	BCMOE BCLM Oct2013 m
Na, K, Ca, Mg, S by CRC ICPMS (diss.)	8	N/A	2021/07/20	BBY WI-00033	Auto Calc
Elements by ICPMS Low Level (dissolved) (5)	8	N/A	2021/07/20	BBY7SOP-00002	EPA 6020b R2 m
Elements by ICPMS Digested LL (total)	4	2021/07/20	2021/07/21	BBY7SOP-00003 / BBY7SOP-00002	EPA 6020b R2 m
Na, K, Ca, Mg, S by CRC ICPMS (total)	4	N/A	2021/07/20	BBY WI-00033	Auto Calc
Na, K, Ca, Mg, S by CRC ICPMS (total)	4	N/A	2021/07/21	BBY WI-00033	Auto Calc
Elements by ICPMS Low Level (total)	4	N/A	2021/07/20	BBY7SOP-00002	EPA 6020b R2 m
Nitrogen (Total)	8	N/A	2021/07/21	BBY6SOP-00016	SM 23 4500-N C m
Un-ionized Ammonia as N @ 15 C	8	N/A	2021/07/21	BBY WI-00033	Auto Calc
Ammonia-N Low Level (Preserved) (1)	8	N/A	2021/07/21	AB SOP-00007	SM 23 4500 NH3 A G m
Nitrate+Nitrite (N) (low level)	8	N/A	2021/07/17	BBY6SOP-00010	SM 23 4500-NO3- I m
Nitrite (N) (low level)	8	N/A	2021/07/17	BBY6SOP-00010	SM 23 4500-NO3- I m
Nitrogen - Nitrate (as N) Low Level Calc	8	N/A	2021/07/20	BBY WI-00033	Auto Calc
Filter and HNO3 Preserve for Metals	8	N/A	2021/07/16	BBY7 WI-00004	SM 23 3030B m
pH measured @ 15 C (2, 6)	8	N/A	2021/07/20	EENVSOP-00159	SM 23 4500 H+ B m
pH @25°C (6)	8	N/A	2021/07/19	BBY6SOP-00026	SM 23 4500-H+ B m

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Your C.O.C. #: 640722-01-01

Attention: Devon O'Connor

Government of Yukon
Box 2703
Whitehorse, AB
Canada Y1A 2C6

Report Date: 2021/07/30
Report #: R3052798
Version: 2 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C150922
Received: 2021/07/15, 12:30

Sample Matrix: Water
Samples Received: 8

Analyses	Quantity	Date Extracted	Date Analyzed	Laboratory Method	Analytical Method
Total Sulphide (1)	8	N/A	2021/07/21	AB SOP-00080	SM 23 4500 S2-A D Fm
Total Dissolved Solids - Low Level (1)	8	2021/07/20	2021/07/20	AB SOP-00065	SM 23 2540 C m
Total Suspended Solids (NFR)	8	2021/07/21	2021/07/22	BBY6SOP-00034	SM 23 2540 D m

Remarks:

Bureau Veritas is accredited to ISO/IEC 17025 for specific parameters on scopes of accreditation. Unless otherwise noted, procedures used by Bureau Veritas are based upon recognized Provincial, Federal or US method compendia such as CCME, MELCC, EPA, APHA.

All work recorded herein has been done in accordance with procedures and practices ordinarily exercised by professionals in Bureau Veritas' profession using accepted testing methodologies, quality assurance and quality control procedures (except where otherwise agreed by the client and Bureau Veritas in writing). All data is in statistical control and has met quality control and method performance criteria unless otherwise noted. All method blanks are reported; unless indicated otherwise, associated sample data are not blank corrected. Where applicable, unless otherwise noted, Measurement Uncertainty has not been accounted for when stating conformity to the referenced standard.

Bureau Veritas liability is limited to the actual cost of the requested analyses, unless otherwise agreed in writing. There is no other warranty expressed or implied. Bureau Veritas has been retained to provide analysis of samples provided by the Client using the testing methodology referenced in this report. Interpretation and use of test results are the sole responsibility of the Client and are not within the scope of services provided by Bureau Veritas, unless otherwise agreed in writing. Bureau Veritas is not responsible for the accuracy or any data impacts, that result from the information provided by the customer or their agent.

Solid sample results, except biota, are based on dry weight unless otherwise indicated. Organic analyses are not recovery corrected except for isotope dilution methods.
Results relate to samples tested. When sampling is not conducted by Bureau Veritas, results relate to the supplied samples tested.

Reference Method suffix “m” indicates test methods incorporate validated modifications from specific reference methods to improve performance.
* RPDs calculated using raw data. The rounding of final results may result in the apparent difference.
(1) This test was performed by Bureau Veritas Calgary Environmental
(2) This test was performed by Bureau Veritas Edmonton Environmental
(3) DOC present in the sample should be considered as non-purgeable DOC. Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(4) "Total Hardness" was calculated from Total Ca and Mg concentrations and may be biased high (Hardness, or Dissolved Hardness, calculated from Dissolved Ca and Mg, should be used for compliance if available).
(5) Dissolved > Total Imbalance: When applicable, Dissolved and Total results were reviewed and data quality meets acceptable levels unless otherwise noted.
(6) The CCME method requires pH to be analysed within 15 minutes of sampling and therefore field analysis is required for compliance. All Laboratory pH analyses in this report are reported past the CCME holding time. Bureau Veritas Laboratories endeavours to analyze samples as soon as possible after receipt.

Your C.O.C. #: 640722-01-01

Attention: Devon O'Connor

Government of Yukon
Box 2703
Whitehorse, AB
Canada Y1A 2C6

Report Date: 2021/07/30
Report #: R3052798
Version: 2 - Final

CERTIFICATE OF ANALYSIS

BV LABS JOB #: C150922
Received: 2021/07/15, 12:30

Encryption Key

Please direct all questions regarding this Certificate of Analysis to your Project Manager.
Customer Solutions, Western Canada Customer Experience Team
Email: customersolutionswest@bureauveritas.com
Phone# (604) 734 7276
==========
BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports. For Service Group specific validation please refer to the Validation Signature Page.

BV Labs Job #: C150922
Report Date: 2021/07/30

Government of Yukon

RESULTS OF CHEMICAL ANALYSES OF WATER

BV Labs ID		ABY047			ABY048			ABY048		
Sampling Date		2021/07/14 14:00			2021/07/14 13:15			2021/07/14 13:15		
COC Number		640722-01-01			640722-01-01			640722-01-01		
	UNITS	DC-DX-105-R	RDL	QC Batch	DC-DX-105	RDL	QC Batch	DC-DX-105 Lab-Dup	RDL	QC Batch
Calculated Parameters										
Filter and HNO3 Preservation	N/A	FIELD		ONSITE	FIELD		ONSITE			
Nitrate (N)	mg/L	0.0121	0.0020	A289022	0.0137	0.0020	A289022			
Sulphide (as H2S)	mg/L	<0.0020	0.0020	A289156	0.0022	0.0020	A289156			
Un-Ionized Ammonia @ 15 °C	mg/L	<0.00050	0.00050	A288748	<0.00050	0.00050	A288748			
Total Cyanate (CNO-)	mg/L	<0.050	0.050	A306006	<0.050	0.050	A306006			
Misc. Inorganics										
Conductivity	uS/cm	1200	2.0	A292092	1200	2.0	A292092			
Strong Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	0.00050	A293012	<0.00050	0.00050	A292997			
Weak Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	0.00050	A293013	<0.00050	0.00050	A293007			
Dissolved Organic Carbon (C)	mg/L	1.2	0.20	A296341	1.5	0.20	A296341			
pH	pH	7.86	N/A	A292089	7.83	N/A	A292089			
Total Suspended Solids	mg/L	<1.0	1.0	A293318	<1.0	1.0	A293312	<1.0	1.0	A293312
Anions										
Alkalinity (PP as CaCO3)	mg/L	<1.0	1.0	A292091	<1.0	1.0	A292091			
Alkalinity (Total as CaCO3)	mg/L	260	1.0	A292091	270	1.0	A292091			
Bicarbonate (HCO3)	mg/L	320	1.0	A292091	320	1.0	A292091			
Carbonate (CO3)	mg/L	<1.0	1.0	A292091	<1.0	1.0	A292091			
Hydroxide (OH)	mg/L	<1.0	1.0	A292091	<1.0	1.0	A292091			
Total Sulphide	mg/L	<0.0018	0.0018	A292230	0.0020	0.0018	A292230			
Dissolved Chloride (Cl)	mg/L	0.61	0.50	A291083	0.66	0.50	A291083			
Dissolved Sulphate (SO4)	mg/L	430	5.0	A291083	430	5.0	A291083			
Nutrients										
Total Ammonia (N)	mg/L	0.018	0.0050	A293243	0.028	0.0050	A293247			
Nitrate plus Nitrite (N)	mg/L	0.0121	0.0020	A289468	0.0137	0.0020	A289468			
Nitrite (N)	mg/L	<0.0020	0.0020	A289470	<0.0020	0.0020	A289470			
Total Nitrogen (N)	mg/L	0.146	0.020	A292472	0.141	0.020	A292472			
Physical Properties										
pH (15 C)	pH	7.26		A291920	7.00		A291920			
Physical Properties										
Total Dissolved Solids	mg/L	922	1.0	A292144	914 (1)	1.4	A292144			

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Detection limit raised based on sample volume used for analysis.

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

RESULTS OF CHEMICAL ANALYSES OF WATER

BV Labs ID		ABY049		ABY050		ABY051		
Sampling Date		2021/07/14 13:30		2021/07/14 13:10		2021/07/14 11:15		
COC Number		640722-01-01		640722-01-01		640722-01-01		
	UNITS	MS-P	QC Batch	DC-8	QC Batch	MS-ROAD	RDL	QC Batch
Calculated Parameters								
Filter and HNO3 Preservation	N/A	FIELD	ONSITE	FIELD	ONSITE	FIELD		ONSITE
Nitrate (N)	mg/L	0.0566	A289022	0.0039	A289022	0.0104	0.0020	A289022
Sulphide (as H2S)	mg/L	<0.0020	A289156	0.015	A289156	0.0038	0.0020	A289156
Un-Ionized Ammonia @ 15 °C	mg/L	<0.00050	A288748	0.0035	A288748	<0.00050	0.00050	A288748
Total Cyanate (CNO-)	mg/L	<0.050	A306006	<0.050	A306006	<0.050	0.050	A306006
Misc. Inorganics								
Conductivity	uS/cm	1700	A292092	2700	A292092	1700	2.0	A292092
Strong Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	A292997	<0.00050	A292997	0.00107	0.00050	A292997
Weak Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	A293007	<0.00050	A293007	<0.00050	0.00050	A293007
Dissolved Organic Carbon (C)	mg/L	2.8	A296341	6.3	A296341	3.4	0.20	A296341
pH	pH	7.99	A292089	7.84	A292089	8.18	N/A	A292089
Total Suspended Solids	mg/L	<1.0	A293312	93	A293321	2.0	1.0	A293318
Anions								
Alkalinity (PP as CaCO3)	mg/L	<1.0	A292091	<1.0	A292091	<1.0	1.0	A292091
Alkalinity (Total as CaCO3)	mg/L	300	A292091	450	A292091	330	1.0	A292091
Bicarbonate (HCO3)	mg/L	370	A292091	550	A292091	410	1.0	A292091
Carbonate (CO3)	mg/L	<1.0	A292091	<1.0	A292091	<1.0	1.0	A292091
Hydroxide (OH)	mg/L	<1.0	A292091	<1.0	A292091	<1.0	1.0	A292091
Total Sulphide	mg/L	<0.0018 (1)	A292230	0.014 (1)	A292230	0.0035 (1)	0.0018	A292230
Dissolved Chloride (Cl)	mg/L	0.61	A291083	1.1	A291083	0.64	0.50	A291083
Dissolved Sulphate (SO4)	mg/L	810	A291083	1500	A291083	730	5.0	A291083
Nutrients								
Total Ammonia (N)	mg/L	0.0085	A293243	1.4	A293243	0.033	0.0050	A293243
Nitrate plus Nitrite (N)	mg/L	0.0566	A289468	0.0039	A289468	0.0104	0.0020	A289468
Nitrite (N)	mg/L	<0.0020	A289470	<0.0020	A289470	<0.0020	0.0020	A289470
Total Nitrogen (N)	mg/L	0.207	A292472	1.67	A292472	0.181	0.020	A292472
Physical Properties								
pH (15 C)	pH	7.25	A291920	6.97	A291920	7.41		A291920
Physical Properties								
Total Dissolved Solids	mg/L	1500	A292144	2510 (2)	A292144	1410	1.0	A292144

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Sample pH <9, preservation incomplete. Due to volatility of analyte, a low bias in the results is likely.
(2) Detection limit raised based on sample volume used for analysis.

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

RESULTS OF CHEMICAL ANALYSES OF WATER

BV Labs ID		ABY052			ABY052			ABY053		
Sampling Date		2021/07/14 09:05			2021/07/14 09:05			2021/07/14 09:55		
COC Number		640722-01-01			640722-01-01			640722-01-01		
	UNITS	DC-DX	RDL	QC Batch	DC-DX Lab-Dup	RDL	QC Batch	MS-S-03	RDL	QC Batch
Calculated Parameters										
Filter and HNO3 Preservation	N/A	FIELD		ONSITE				FIELD		ONSITE
Nitrate (N)	mg/L	0.0021	0.0020	A289022				0.0048	0.0020	A289022
Sulphide (as H2S)	mg/L	<0.0020	0.0020	A289156				<0.0020	0.0020	A289156
Un-Ionized Ammonia @ 15 °C	mg/L	<0.00050	0.00050	A288748				<0.00050	0.00050	A288748
Total Cyanate (CNO-)	mg/L	<0.050	0.050	A306006				<0.050	0.050	A306006
Misc. Inorganics										
Conductivity	uS/cm	450	2.0	A292092	440	2.0	A292092	1200	2.0	A292098
Strong Acid Dissoc. Cyanide (CN)	mg/L	0.00054	0.00050	A292997				<0.00050	0.00050	A290697
Weak Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	0.00050	A293007				<0.00050	0.00050	A290700
Dissolved Organic Carbon (C)	mg/L	8.2	0.20	A296341				1.3	0.20	A296341
pH	pH	7.89	N/A	A292089	7.76	N/A	A292089	7.67	N/A	A292093
Total Suspended Solids	mg/L	8.4	1.0	A293312				4.0	1.0	A293321
Anions										
Alkalinity (PP as CaCO3)	mg/L	<1.0	1.0	A292091	<1.0	1.0	A292091	<1.0	1.0	A292094
Alkalinity (Total as CaCO3)	mg/L	110	1.0	A292091	110	1.0	A292091	270	1.0	A292094
Bicarbonate (HCO3)	mg/L	140	1.0	A292091	130	1.0	A292091	330	1.0	A292094
Carbonate (CO3)	mg/L	<1.0	1.0	A292091	<1.0	1.0	A292091	<1.0	1.0	A292094
Hydroxide (OH)	mg/L	<1.0	1.0	A292091	<1.0	1.0	A292091	<1.0	1.0	A292094
Total Sulphide	mg/L	<0.0018	0.0018	A292230				<0.0018 (1)	0.0018	A292683
Dissolved Chloride (Cl)	mg/L	<0.50	0.50	A291083				0.77	0.50	A291083
Dissolved Sulphate (SO4)	mg/L	130	0.50	A291083				470	5.0	A291083
Nutrients										
Total Ammonia (N)	mg/L	0.015	0.0050	A293247				0.016	0.0050	A293243
Nitrate plus Nitrite (N)	mg/L	0.0021	0.0020	A289471	<0.0020	0.0020	A289471	0.0048	0.0020	A289471
Nitrite (N)	mg/L	<0.0020	0.0020	A289472	<0.0020	0.0020	A289472	<0.0020	0.0020	A289472
Total Nitrogen (N)	mg/L	0.313	0.020	A292472				0.080	0.020	A292472
Physical Properties										
pH (15 C)	pH	7.23		A291920				6.93		A291920
Physical Properties										
Total Dissolved Solids	mg/L	290	1.0	A292144				994	1.0	A292144

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
N/A = Not Applicable
(1) Sample pH <9, preservation incomplete. Due to volatility of analyte, a low bias in the results is likely.

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

RESULTS OF CHEMICAL ANALYSES OF WATER

BV Labs ID		ABY054		
Sampling Date		2021/07/14 10:30		
COC Number		640722-01-01		
	UNITS	**DC-15**	**RDL**	**QC Batch**
Calculated Parameters				
Filter and HNO3 Preservation	N/A	FIELD		ONSITE
Nitrate (N)	mg/L	0.0065	0.0020	A289022
Sulphide (as H2S)	mg/L	0.0022	0.0020	A289156
Un-Ionized Ammonia @ 15 °C	mg/L	<0.00050	0.00050	A288748
Total Cyanate (CNO-)	mg/L	<0.050	0.050	A306006
Misc. Inorganics				
Conductivity	uS/cm	1200	2.0	A292098
Strong Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	0.00050	A292997
Weak Acid Dissoc. Cyanide (CN)	mg/L	<0.00050	0.00050	A293007
Dissolved Organic Carbon (C)	mg/L	1.8	0.20	A296341
pH	pH	8.00	N/A	A292093
Total Suspended Solids	mg/L	1.6	1.0	A293318
Anions				
Alkalinity (PP as CaCO3)	mg/L	<1.0	1.0	A292094
Alkalinity (Total as CaCO3)	mg/L	250	1.0	A292094
Bicarbonate (HCO3)	mg/L	310	1.0	A292094
Carbonate (CO3)	mg/L	<1.0	1.0	A292094
Hydroxide (OH)	mg/L	<1.0	1.0	A292094
Total Sulphide	mg/L	0.0020	0.0018	A292683
Dissolved Chloride (Cl)	mg/L	0.80	0.50	A291083
Dissolved Sulphate (SO4)	mg/L	310	5.0	A291083
Nutrients				
Total Ammonia (N)	mg/L	<0.0050	0.0050	A293243
Nitrate plus Nitrite (N)	mg/L	0.0065	0.0020	A289471
Nitrite (N)	mg/L	<0.0020	0.0020	A289472
Total Nitrogen (N)	mg/L	0.102	0.020	A292472
Physical Properties				
pH (15 C)	pH	7.41		A291920
Physical Properties				
Total Dissolved Solids	mg/L	930 (1)	1.1	A292144

RDL = Reportable Detection Limit
N/A = Not Applicable
(1) Detection limit raised based on sample volume used for analysis.

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

BV Labs ID		ABY047	ABY048		ABY049	ABY050		ABY051		
Sampling Date		2021/07/14 14:00	2021/07/14 13:15		2021/07/14 13:30	2021/07/14 13:10		2021/07/14 11:15		
COC Number		640722-01-01	640722-01-01		640722-01-01	640722-01-01		640722-01-01		
	UNITS	DC-DX-105-R	DC-DX-105	RDL	MS-P	DC-8	RDL	MS-ROAD	RDL	QC Batch
Calculated Parameters										
Dissolved Hardness (CaCO3)	mg/L	639	639	0.50	1030	1740	0.50	967	0.50	A288355
Elements										
Dissolved Mercury (Hg)	ug/L	<0.0019	<0.0019	0.0019	<0.0019	<0.0019	0.0019	<0.0019	0.0019	A292190
Dissolved Metals by ICPMS										
Dissolved Aluminum (Al)	ug/L	1.80	1.67	0.50	3.6	10.9	1.0	1.48	0.50	A290867
Dissolved Antimony (Sb)	ug/L	7.66	7.68	0.020	72.0	0.324	0.040	9.70	0.020	A290867
Dissolved Arsenic (As)	ug/L	9.71	9.67	0.020	36.3	68.8	0.040	29.4	0.020	A290867
Dissolved Barium (Ba)	ug/L	12.2	12.1	0.020	10.6	28.1	0.040	14.9	0.020	A290867
Dissolved Beryllium (Be)	ug/L	0.010	<0.010	0.010	<0.020	<0.020	0.020	<0.010	0.010	A290867
Dissolved Bismuth (Bi)	ug/L	<0.0050	<0.0050	0.0050	<0.010	<0.010	0.010	<0.0050	0.0050	A290867
Dissolved Boron (B)	ug/L	<10	<10	10	47	176	20	<10	10	A290867
Dissolved Cadmium (Cd)	ug/L	36.5	36.1	0.0050	21.8	<0.010	0.010	1.26	0.0050	A290867
Dissolved Chromium (Cr)	ug/L	<0.10	<0.10	0.10	<0.20	<0.20	0.20	<0.10	0.10	A290867
Dissolved Cobalt (Co)	ug/L	1.48	1.52	0.0050	0.158	1.27	0.010	1.00	0.0050	A290867
Dissolved Copper (Cu)	ug/L	1.59	1.60	0.050	7.49	0.13	0.10	1.53	0.050	A290867
Dissolved Iron (Fe)	ug/L	56.3	56.2	1.0	2.8	10200	2.0	65.3	1.0	A290867
Dissolved Lead (Pb)	ug/L	<0.0050	<0.0050	0.0050	4.52	0.015	0.010	0.0612	0.0050	A290867
Dissolved Lithium (Li)	ug/L	9.08	8.95	0.50	10.5	16.9	1.0	10.2	0.50	A290867
Dissolved Manganese (Mn)	ug/L	1290	1310	0.050	107	2170	0.10	1220	0.050	A290867
Dissolved Molybdenum (Mo)	ug/L	0.297	0.308	0.050	0.16	0.11	0.10	0.170	0.050	A290867
Dissolved Nickel (Ni)	ug/L	3.39	3.55	0.020	2.32	0.516	0.040	1.12	0.020	A290867
Dissolved Phosphorus (P)	ug/L	<2.0	<2.0	2.0	<4.0	68.7	4.0	<2.0	2.0	A290867
Dissolved Selenium (Se)	ug/L	0.053	0.058	0.040	0.095	0.088	0.080	0.072	0.040	A290867
Dissolved Silicon (Si)	ug/L	6220	6140	50	4750	5810	100	5490	50	A290867
Dissolved Silver (Ag)	ug/L	<0.0050	<0.0050	0.0050	<0.010	<0.010	0.010	<0.0050	0.0050	A290867
Dissolved Strontium (Sr)	ug/L	408	399	0.050	590	962	0.10	564	0.050	A290867
Dissolved Thallium (Tl)	ug/L	0.101	0.103	0.0020	0.308	0.0325	0.0040	0.105	0.0020	A290867
Dissolved Tin (Sn)	ug/L	<0.20	<0.20	0.20	<0.40	<0.40	0.40	<0.20	0.20	A290867
Dissolved Titanium (Ti)	ug/L	<0.50	<0.50	0.50	<1.0	<1.0	1.0	<0.50	0.50	A290867
Dissolved Uranium (U)	ug/L	4.22	4.28	0.0020	3.83	4.34	0.0040	4.34	0.0020	A290867
Dissolved Vanadium (V)	ug/L	<0.20	<0.20	0.20	<0.40	0.49	0.40	<0.20	0.20	A290867
Dissolved Zinc (Zn)	ug/L	4310	4420	0.10	2230	1.17	0.20	100	0.10	A290867
Dissolved Zirconium (Zr)	ug/L	<0.10	<0.10	0.10	<0.20	<0.20	0.20	<0.10	0.10	A290867
Dissolved Calcium (Ca)	mg/L	165	164	0.050	228	305	0.10	218	0.050	A288626

RDL = Reportable Detection Limit

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

BV Labs ID		ABY047	ABY048		ABY049	ABY050		ABY051		
Sampling Date		2021/07/14 14:00	2021/07/14 13:15		2021/07/14 13:30	2021/07/14 13:10		2021/07/14 11:15		
COC Number		640722-01-01	640722-01-01		640722-01-01	640722-01-01		640722-01-01		
	UNITS	**DC-DX-105-R**	**DC-DX-105**	**RDL**	**MS-P**	**DC-8**	**RDL**	**MS-ROAD**	**RDL**	**QC Batch**
Dissolved Magnesium (Mg)	mg/L	55.2	55.6	0.050	113	238	0.10	103	0.050	A288626
Dissolved Potassium (K)	mg/L	3.24	3.35	0.050	5.25	6.56	0.10	4.35	0.050	A288626
Dissolved Sodium (Na)	mg/L	4.81	4.86	0.050	6.81	11.9	0.10	6.23	0.050	A288626
Dissolved Sulphur (S)	mg/L	140	141	3.0	268	465	6.0	231	3.0	A288626
RDL = Reportable Detection Limit										

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

BV Labs ID		ABY052	ABY053	ABY054		
Sampling Date		2021/07/14 09:05	2021/07/14 09:55	2021/07/14 10:30		
COC Number		640722-01-01	640722-01-01	640722-01-01		
	UNITS	**DC-DX**	**MS-S-03**	**DC-15**	**RDL**	**QC Batch**
Calculated Parameters						
Dissolved Hardness (CaCO3)	mg/L	208	676	631	0.50	A288355
Elements						
Dissolved Mercury (Hg)	ug/L	<0.0019	<0.0019	<0.0019	0.0019	A292190
Dissolved Metals by ICPMS						
Dissolved Aluminum (Al)	ug/L	6.73	2.01	2.20	0.50	A290867
Dissolved Antimony (Sb)	ug/L	0.549	11.8	5.24	0.020	A290867
Dissolved Arsenic (As)	ug/L	4.98	71.8	6.51	0.020	A290867
Dissolved Barium (Ba)	ug/L	30.0	8.49	11.6	0.020	A290867
Dissolved Beryllium (Be)	ug/L	<0.010	0.022	<0.010	0.010	A290867
Dissolved Bismuth (Bi)	ug/L	<0.0050	<0.0050	<0.0050	0.0050	A290867
Dissolved Boron (B)	ug/L	<10	<10	<10	10	A290867
Dissolved Cadmium (Cd)	ug/L	0.0117	63.2	14.6	0.0050	A290867
Dissolved Chromium (Cr)	ug/L	<0.10	<0.10	<0.10	0.10	A290867
Dissolved Cobalt (Co)	ug/L	0.600	2.87	0.0465	0.0050	A290867
Dissolved Copper (Cu)	ug/L	0.696	5.44	0.788	0.050	A290867
Dissolved Iron (Fe)	ug/L	660	363	4.4	1.0	A290867
Dissolved Lead (Pb)	ug/L	<0.0050	<0.0050	0.0056	0.0050	A290867
Dissolved Lithium (Li)	ug/L	<0.50	10.2	8.71	0.50	A290867
Dissolved Manganese (Mn)	ug/L	445	1620	36.0	0.050	A290867
Dissolved Molybdenum (Mo)	ug/L	0.059	0.298	0.197	0.050	A290867
Dissolved Nickel (Ni)	ug/L	0.463	4.84	2.24	0.020	A290867
Dissolved Phosphorus (P)	ug/L	4.1	3.4	2.9	2.0	A290867
Dissolved Selenium (Se)	ug/L	0.046	0.075	0.046	0.040	A290867
Dissolved Silicon (Si)	ug/L	5130	6270	6150	50	A290867
Dissolved Silver (Ag)	ug/L	<0.0050	<0.0050	<0.0050	0.0050	A290867
Dissolved Strontium (Sr)	ug/L	193	427	414	0.050	A290867
Dissolved Thallium (Tl)	ug/L	0.0086	0.137	0.0441	0.0020	A290867
Dissolved Tin (Sn)	ug/L	<0.20	<0.20	<0.20	0.20	A290867
Dissolved Titanium (Ti)	ug/L	<0.50	<0.50	<0.50	0.50	A290867
Dissolved Uranium (U)	ug/L	0.181	4.38	4.47	0.0020	A290867
Dissolved Vanadium (V)	ug/L	<0.20	<0.20	<0.20	0.20	A290867
Dissolved Zinc (Zn)	ug/L	0.76	6500	2960	0.10	A290867
Dissolved Zirconium (Zr)	ug/L	<0.10	<0.10	<0.10	0.10	A290867
Dissolved Calcium (Ca)	mg/L	57.0	174	164	0.050	A288626
RDL = Reportable Detection Limit						

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LOW LEVEL DISSOLVED METALS WITH CV HG (WATER)

BV Labs ID		ABY052	ABY053	ABY054		
Sampling Date		2021/07/14 09:05	2021/07/14 09:55	2021/07/14 10:30		
COC Number		640722-01-01	640722-01-01	640722-01-01		
	UNITS	DC-DX	MS-S-03	DC-15	RDL	QC Batch
Dissolved Magnesium (Mg)	mg/L	16.0	58.6	54.0	0.050	A288626
Dissolved Potassium (K)	mg/L	3.26	3.33	3.18	0.050	A288626
Dissolved Sodium (Na)	mg/L	2.68	4.63	4.64	0.050	A288626
Dissolved Sulphur (S)	mg/L	38.6	155	140	3.0	A288626
RDL = Reportable Detection Limit						

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LOW LEVEL TOTAL METALS WITH CV HG (WATER)

BV Labs ID		ABY047			ABY047			ABY048		
Sampling Date		2021/07/14 14:00			2021/07/14 14:00			2021/07/14 13:15		
COC Number		640722-01-01			640722-01-01			640722-01-01		
	UNITS	DC-DX-105-R	RDL	QC Batch	DC-DX-105-R Lab-Dup	RDL	QC Batch	DC-DX-105	RDL	QC Batch
Calculated Parameters										
Total Hardness (CaCO3)	mg/L	675	0.50	A288354				669	0.50	A288354
Elements										
Total Mercury (Hg)	ug/L	<0.0019 (1)	0.0019	A292133	<0.0019	0.0019	A292133	<0.0019	0.0019	A292133
Total Metals by ICPMS										
Total Aluminum (Al)	ug/L	2.66	0.50	A290362				2.91	0.50	A290362
Total Antimony (Sb)	ug/L	8.04	0.020	A290362				8.13	0.020	A290362
Total Arsenic (As)	ug/L	23.6	0.020	A290362				24.7	0.020	A290362
Total Barium (Ba)	ug/L	12.8	0.020	A290362				12.8	0.020	A290362
Total Beryllium (Be)	ug/L	<0.010	0.010	A290362				<0.010	0.010	A290362
Total Bismuth (Bi)	ug/L	<0.0050	0.0050	A290362				<0.0050	0.0050	A290362
Total Boron (B)	ug/L	<10	10	A290362				<10	10	A290362
Total Cadmium (Cd)	ug/L	38.2	0.0050	A290362				38.5	0.0050	A290362
Total Chromium (Cr)	ug/L	<0.10	0.10	A290362				<0.10	0.10	A290362
Total Cobalt (Co)	ug/L	1.52	0.0050	A290362				1.52	0.0050	A290362
Total Copper (Cu)	ug/L	4.36	0.050	A290362				4.51	0.050	A290362
Total Iron (Fe)	ug/L	140	1.0	A290362				148	1.0	A290362
Total Lead (Pb)	ug/L	0.0302	0.0050	A290362				0.0381	0.0050	A290362
Total Lithium (Li)	ug/L	9.43	0.50	A290362				9.40	0.50	A290362
Total Manganese (Mn)	ug/L	1350	0.050	A290362				1340	0.050	A290362
Total Molybdenum (Mo)	ug/L	0.326	0.050	A290362				0.327	0.050	A290362
Total Nickel (Ni)	ug/L	3.55	0.020	A290362				3.61	0.020	A290362
Total Phosphorus (P)	ug/L	<2.0	2.0	A290362				<2.0	2.0	A290362
Total Selenium (Se)	ug/L	0.054	0.040	A290362				0.060	0.040	A290362
Total Silicon (Si)	ug/L	6590	50	A290362				6680	50	A290362
Total Silver (Ag)	ug/L	<0.0050	0.0050	A290362				<0.0050	0.0050	A290362
Total Strontium (Sr)	ug/L	430	0.050	A290362				441	0.050	A290362
Total Thallium (Tl)	ug/L	0.0934	0.0020	A290362				0.0961	0.0020	A290362
Total Tin (Sn)	ug/L	<0.20	0.20	A290362				<0.20	0.20	A290362
Total Titanium (Ti)	ug/L	<0.50	0.50	A290362				<0.50	0.50	A290362
Total Uranium (U)	ug/L	4.36	0.0020	A290362				4.46	0.0020	A290362
Total Vanadium (V)	ug/L	<0.20	0.20	A290362				<0.20	0.20	A290362
Total Zinc (Zn)	ug/L	4530	0.10	A290362				4500	0.10	A290362

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate
(1) Matrix Spike exceeds acceptance limits - Probable matrix interference.

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LOW LEVEL TOTAL METALS WITH CV HG (WATER)

BV Labs ID		ABY047			ABY047			ABY048		
Sampling Date		2021/07/14 14:00			2021/07/14 14:00			2021/07/14 13:15		
COC Number		640722-01-01			640722-01-01			640722-01-01		
	UNITS	DC-DX-105-R	RDL	QC Batch	DC-DX-105-R Lab-Dup	RDL	QC Batch	DC-DX-105	RDL	QC Batch
Total Zirconium (Zr)	ug/L	<0.10	0.10	A290362				<0.10	0.10	A290362
Total Calcium (Ca)	mg/L	174	0.050	A288627				173	0.050	A288627
Total Magnesium (Mg)	mg/L	58.4	0.050	A288627				57.3	0.050	A288627
Total Potassium (K)	mg/L	3.52	0.050	A288627				3.51	0.050	A288627
Total Sodium (Na)	mg/L	5.09	0.050	A288627				4.99	0.050	A288627
Total Sulphur (S)	mg/L	153	3.0	A288627				152	3.0	A288627

RDL = Reportable Detection Limit
Lab-Dup = Laboratory Initiated Duplicate

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LOW LEVEL TOTAL METALS WITH CV HG (WATER)

BV Labs ID		ABY053	ABY054		
Sampling Date		2021/07/14 09:55	2021/07/14 10:30		
COC Number		640722-01-01	640722-01-01		
	UNITS	MS-S-03	DC-15	RDL	QC Batch
Calculated Parameters					
Total Hardness (CaCO3)	mg/L	713	656	0.50	A288354
Elements					
Total Mercury (Hg)	ug/L	<0.0019	<0.0019	0.0019	A292133
Total Metals by ICPMS					
Total Aluminum (Al)	ug/L	4.79	8.60	0.50	A290362
Total Antimony (Sb)	ug/L	12.7	5.44	0.020	A290362
Total Arsenic (As)	ug/L	101	9.11	0.020	A290362
Total Barium (Ba)	ug/L	8.98	12.0	0.020	A290362
Total Beryllium (Be)	ug/L	0.024	<0.010	0.010	A290362
Total Bismuth (Bi)	ug/L	<0.0050	<0.0050	0.0050	A290362
Total Boron (B)	ug/L	<10	<10	10	A290362
Total Cadmium (Cd)	ug/L	67.2	15.4	0.0050	A290362
Total Chromium (Cr)	ug/L	<0.10	<0.10	0.10	A290362
Total Cobalt (Co)	ug/L	2.91	0.0578	0.0050	A290362
Total Copper (Cu)	ug/L	19.0	1.17	0.050	A290362
Total Iron (Fe)	ug/L	484	43.6	1.0	A290362
Total Lead (Pb)	ug/L	0.147	0.148	0.0050	A290362
Total Lithium (Li)	ug/L	10.9	9.07	0.50	A290362
Total Manganese (Mn)	ug/L	1630	44.0	0.050	A290362
Total Molybdenum (Mo)	ug/L	0.309	0.182	0.050	A290362
Total Nickel (Ni)	ug/L	5.04	2.34	0.020	A290362
Total Phosphorus (P)	ug/L	2.3	2.2	2.0	A290362
Total Selenium (Se)	ug/L	0.068	0.042	0.040	A290362
Total Silicon (Si)	ug/L	6700	6280	50	A290362
Total Silver (Ag)	ug/L	<0.0050	<0.0050	0.0050	A290362
Total Strontium (Sr)	ug/L	456	424	0.050	A290362
Total Thallium (Tl)	ug/L	0.138	0.0375	0.0020	A290362
Total Tin (Sn)	ug/L	<0.20	<0.20	0.20	A290362
Total Titanium (Ti)	ug/L	<0.50	<0.50	0.50	A290362
Total Uranium (U)	ug/L	4.44	4.47	0.0020	A290362
Total Vanadium (V)	ug/L	<0.20	<0.20	0.20	A290362
Total Zinc (Zn)	ug/L	6730	3110	0.10	A290362
Total Zirconium (Zr)	ug/L	<0.10	<0.10	0.10	A290362
Total Calcium (Ca)	mg/L	186	167	0.050	A288627

RDL = Reportable Detection Limit

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LOW LEVEL TOTAL METALS WITH CV HG (WATER)

BV Labs ID		ABY053	ABY054		
Sampling Date		2021/07/14 09:55	2021/07/14 10:30		
COC Number		640722-01-01	640722-01-01		
	UNITS	MS-S-03	DC-15	RDL	QC Batch
Total Magnesium (Mg)	mg/L	60.4	58.0	0.050	A288627
Total Potassium (K)	mg/L	3.46	3.32	0.050	A288627
Total Sodium (Na)	mg/L	4.83	4.91	0.050	A288627
Total Sulphur (S)	mg/L	168	150	3.0	A288627
RDL = Reportable Detection Limit					

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LL TOTAL METALS (DIGESTED) WITH CV HG

BV Labs ID		ABY049		ABY050		ABY051	ABY052		
Sampling Date		2021/07/14 13:30		2021/07/14 13:10		2021/07/14 11:15	2021/07/14 09:05		
COC Number		640722-01-01		640722-01-01		640722-01-01	640722-01-01		
	UNITS	MS-P	RDL	DC-8	RDL	MS-ROAD	DC-DX	RDL	QC Batch
Calculated Parameters									
Total Hardness (CaCO3)	mg/L	1010	0.50	1740	0.50	992	213	0.50	A288354
Elements									
Total Mercury (Hg)	ug/L	<0.0019	0.0019	<0.0019	0.0019	<0.0019	<0.0019	0.0019	A292133
Total Metals by ICPMS									
Total Aluminum (Al)	ug/L	14.7	3.0	855	6.0	11.3	59.1	3.0	A291762
Total Antimony (Sb)	ug/L	74.1	0.020	0.867	0.040	9.65	0.598	0.020	A291762
Total Arsenic (As)	ug/L	40.4	0.020	81.6	0.040	37.9	12.2	0.020	A291762
Total Barium (Ba)	ug/L	10.9	0.050	46.4	0.10	16.3	32.7	0.050	A291762
Total Beryllium (Be)	ug/L	<0.010	0.010	0.041	0.020	<0.010	<0.010	0.010	A291762
Total Bismuth (Bi)	ug/L	<0.010	0.010	<0.020	0.020	<0.010	<0.010	0.010	A291762
Total Boron (B)	ug/L	44	10	164	20	<10	<10	10	A291762
Total Cadmium (Cd)	ug/L	21.7	0.0050	0.083	0.010	1.30	0.0169	0.0050	A291762
Total Chromium (Cr)	ug/L	<0.10	0.10	1.31	0.20	<0.10	0.12	0.10	A291762
Total Cobalt (Co)	ug/L	0.153	0.010	1.74	0.020	1.02	0.602	0.010	A291762
Total Copper (Cu)	ug/L	8.43	0.10	3.15	0.20	2.42	0.99	0.10	A291762
Total Iron (Fe)	ug/L	61.1	5.0	11000	10	161	1520	5.0	A291762
Total Lead (Pb)	ug/L	8.88	0.020	2.12	0.040	1.69	0.135	0.020	A291762
Total Lithium (Li)	ug/L	9.77	0.50	17.9	1.0	10.3	<0.50	0.50	A291762
Total Manganese (Mn)	ug/L	110	0.10	2190	0.20	1250	405	0.10	A291762
Total Molybdenum (Mo)	ug/L	0.172	0.050	0.14	0.10	0.199	0.070	0.050	A291762
Total Nickel (Ni)	ug/L	2.03	0.10	1.22	0.20	1.06	0.53	0.10	A291762
Total Phosphorus (P)	ug/L	6.6	5.0	104	10	5.7	9.3	5.0	A291762
Total Selenium (Se)	ug/L	0.090	0.040	0.090	0.080	0.065	0.044	0.040	A291762
Total Silicon (Si)	ug/L	4670	50	6590	100	5380	5260	50	A291762
Total Silver (Ag)	ug/L	0.024	0.010	<0.020	0.020	0.011	<0.010	0.010	A291762
Total Strontium (Sr)	ug/L	588	0.050	994	0.10	591	197	0.050	A291762
Total Thallium (Tl)	ug/L	0.302	0.0020	0.0512	0.0040	0.0986	0.0095	0.0020	A291762
Total Tin (Sn)	ug/L	<0.20	0.20	<0.40	0.40	<0.20	<0.20	0.20	A291762
Total Titanium (Ti)	ug/L	<2.0	2.0	47.0	4.0	<2.0	3.7	2.0	A291762
Total Uranium (U)	ug/L	3.80	0.0050	4.70	0.010	4.62	0.196	0.0050	A291762
Total Vanadium (V)	ug/L	<0.20	0.20	3.55	0.40	<0.20	0.21	0.20	A291762
Total Zinc (Zn)	ug/L	2070	1.0	8.8	2.0	101	1.1	1.0	A291762
Total Zirconium (Zr)	ug/L	<0.10	0.10	<0.20	0.20	<0.10	<0.10	0.10	A291762
Total Calcium (Ca)	mg/L	231	0.25	308	0.50	220	58.8	0.25	A288627

RDL = Reportable Detection Limit

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

LL TOTAL METALS (DIGESTED) WITH CV HG

BV Labs ID		ABY049		ABY050		ABY051	ABY052		
Sampling Date		2021/07/14 13:30		2021/07/14 13:10		2021/07/14 11:15	2021/07/14 09:05		
COC Number		640722-01-01		640722-01-01		640722-01-01	640722-01-01		
	UNITS	MS-P	RDL	DC-8	RDL	MS-ROAD	DC-DX	RDL	QC Batch
Total Magnesium (Mg)	mg/L	105	0.25	236	0.50	108	16.0	0.25	A288627
Total Potassium (K)	mg/L	5.05	0.25	6.81	0.50	4.50	3.32	0.25	A288627
Total Sodium (Na)	mg/L	6.54	0.25	12.0	0.50	6.59	2.80	0.25	A288627
Total Sulphur (S)	mg/L	263	3.0	478	6.0	247	38.5	3.0	A288627
RDL = Reportable Detection Limit									

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

GENERAL COMMENTS

Samples were not submitted in an appropriate container for this analysis.

Results relate only to the items tested.

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

QUALITY ASSURANCE REPORT

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A289468	TL9	Matrix Spike	Nitrate plus Nitrite (N)	2021/07/17		94	%	80 - 120
A289468	TL9	Spiked Blank	Nitrate plus Nitrite (N)	2021/07/17		106	%	80 - 120
A289468	TL9	Method Blank	Nitrate plus Nitrite (N)	2021/07/17	<0.0020		mg/L	
A289468	TL9	RPD	Nitrate plus Nitrite (N)	2021/07/17	2.1		%	25
A289470	TL9	Matrix Spike	Nitrite (N)	2021/07/17		91	%	80 - 120
A289470	TL9	Spiked Blank	Nitrite (N)	2021/07/17		102	%	80 - 120
A289470	TL9	Method Blank	Nitrite (N)	2021/07/17	<0.0020		mg/L	
A289470	TL9	RPD	Nitrite (N)	2021/07/17	NC		%	25
A289471	TL9	Matrix Spike [ABY052-02]	Nitrate plus Nitrite (N)	2021/07/17		102	%	80 - 120
A289471	TL9	Spiked Blank	Nitrate plus Nitrite (N)	2021/07/17		110	%	80 - 120
A289471	TL9	Method Blank	Nitrate plus Nitrite (N)	2021/07/17	<0.0020		mg/L	
A289471	TL9	RPD [ABY052-02]	Nitrate plus Nitrite (N)	2021/07/17	4.9		%	25
A289472	TL9	Matrix Spike [ABY052-02]	Nitrite (N)	2021/07/17		100	%	80 - 120
A289472	TL9	Spiked Blank	Nitrite (N)	2021/07/17		104	%	80 - 120
A289472	TL9	Method Blank	Nitrite (N)	2021/07/17	<0.0020		mg/L	
A289472	TL9	RPD [ABY052-02]	Nitrite (N)	2021/07/17	NC		%	25
A290362	AA1	Matrix Spike	Total Aluminum (Al)	2021/07/20		103	%	80 - 120
			Total Antimony (Sb)	2021/07/20		104	%	80 - 120
			Total Arsenic (As)	2021/07/20		102	%	80 - 120
			Total Barium (Ba)	2021/07/20		NC	%	80 - 120
			Total Beryllium (Be)	2021/07/20		106	%	80 - 120
			Total Bismuth (Bi)	2021/07/20		92	%	80 - 120
			Total Boron (B)	2021/07/20		105	%	80 - 120
			Total Cadmium (Cd)	2021/07/20		104	%	80 - 120
			Total Chromium (Cr)	2021/07/20		100	%	80 - 120
			Total Cobalt (Co)	2021/07/20		99	%	80 - 120
			Total Copper (Cu)	2021/07/20		95	%	80 - 120
			Total Iron (Fe)	2021/07/20		102	%	80 - 120
			Total Lead (Pb)	2021/07/20		99	%	80 - 120
			Total Lithium (Li)	2021/07/20		106	%	80 - 120
			Total Manganese (Mn)	2021/07/20		94	%	80 - 120
			Total Molybdenum (Mo)	2021/07/20		104	%	80 - 120
			Total Nickel (Ni)	2021/07/20		95	%	80 - 120
			Total Phosphorus (P)	2021/07/20		102	%	80 - 120
			Total Selenium (Se)	2021/07/20		107	%	80 - 120
			Total Silicon (Si)	2021/07/20		NC	%	80 - 120
			Total Silver (Ag)	2021/07/20		101	%	80 - 120
			Total Strontium (Sr)	2021/07/20		NC	%	80 - 120
			Total Thallium (Tl)	2021/07/20		101	%	80 - 120
			Total Tin (Sn)	2021/07/20		103	%	80 - 120
			Total Titanium (Ti)	2021/07/20		102	%	80 - 120
			Total Uranium (U)	2021/07/20		103	%	80 - 120
			Total Vanadium (V)	2021/07/20		100	%	80 - 120
			Total Zinc (Zn)	2021/07/20		101	%	80 - 120
			Total Zirconium (Zr)	2021/07/20		104	%	80 - 120
A290362	AA1	Spiked Blank	Total Aluminum (Al)	2021/07/20		102	%	80 - 120
			Total Antimony (Sb)	2021/07/20		100	%	80 - 120
			Total Arsenic (As)	2021/07/20		97	%	80 - 120
			Total Barium (Ba)	2021/07/20		98	%	80 - 120
			Total Beryllium (Be)	2021/07/20		99	%	80 - 120
			Total Bismuth (Bi)	2021/07/20		96	%	80 - 120
			Total Boron (B)	2021/07/20		103	%	80 - 120
			Total Cadmium (Cd)	2021/07/20		100	%	80 - 120
			Total Chromium (Cr)	2021/07/20		98	%	80 - 120
			Total Cobalt (Co)	2021/07/20		99	%	80 - 120

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Copper (Cu)	2021/07/20		93	%	80 - 120
			Total Iron (Fe)	2021/07/20		101	%	80 - 120
			Total Lead (Pb)	2021/07/20		96	%	80 - 120
			Total Lithium (Li)	2021/07/20		97	%	80 - 120
			Total Manganese (Mn)	2021/07/20		96	%	80 - 120
			Total Molybdenum (Mo)	2021/07/20		99	%	80 - 120
			Total Nickel (Ni)	2021/07/20		97	%	80 - 120
			Total Phosphorus (P)	2021/07/20		98	%	80 - 120
			Total Selenium (Se)	2021/07/20		97	%	80 - 120
			Total Silicon (Si)	2021/07/20		100	%	80 - 120
			Total Silver (Ag)	2021/07/20		97	%	80 - 120
			Total Strontium (Sr)	2021/07/20		97	%	80 - 120
			Total Thallium (Tl)	2021/07/20		97	%	80 - 120
			Total Tin (Sn)	2021/07/20		103	%	80 - 120
			Total Titanium (Ti)	2021/07/20		98	%	80 - 120
			Total Uranium (U)	2021/07/20		98	%	80 - 120
			Total Vanadium (V)	2021/07/20		98	%	80 - 120
			Total Zinc (Zn)	2021/07/20		99	%	80 - 120
			Total Zirconium (Zr)	2021/07/20		99	%	80 - 120
A290362	AA1	Method Blank	Total Aluminum (Al)	2021/07/20	<0.50		ug/L	
			Total Antimony (Sb)	2021/07/20	<0.020		ug/L	
			Total Arsenic (As)	2021/07/20	<0.020		ug/L	
			Total Barium (Ba)	2021/07/20	<0.020		ug/L	
			Total Beryllium (Be)	2021/07/20	<0.010		ug/L	
			Total Bismuth (Bi)	2021/07/20	<0.0050		ug/L	
			Total Boron (B)	2021/07/20	<10		ug/L	
			Total Cadmium (Cd)	2021/07/20	<0.0050		ug/L	
			Total Chromium (Cr)	2021/07/20	<0.10		ug/L	
			Total Cobalt (Co)	2021/07/20	<0.0050		ug/L	
			Total Copper (Cu)	2021/07/20	<0.050		ug/L	
			Total Iron (Fe)	2021/07/20	<1.0		ug/L	
			Total Lead (Pb)	2021/07/20	<0.0050		ug/L	
			Total Lithium (Li)	2021/07/20	<0.50		ug/L	
			Total Manganese (Mn)	2021/07/20	<0.050		ug/L	
			Total Molybdenum (Mo)	2021/07/20	<0.050		ug/L	
			Total Nickel (Ni)	2021/07/20	<0.020		ug/L	
			Total Phosphorus (P)	2021/07/20	<2.0		ug/L	
			Total Selenium (Se)	2021/07/20	<0.040		ug/L	
			Total Silicon (Si)	2021/07/20	<50		ug/L	
			Total Silver (Ag)	2021/07/20	<0.0050		ug/L	
			Total Strontium (Sr)	2021/07/20	<0.050		ug/L	
			Total Thallium (Tl)	2021/07/20	<0.0020		ug/L	
			Total Tin (Sn)	2021/07/20	<0.20		ug/L	
			Total Titanium (Ti)	2021/07/20	<0.50		ug/L	
			Total Uranium (U)	2021/07/20	<0.0020		ug/L	
			Total Vanadium (V)	2021/07/20	<0.20		ug/L	
			Total Zinc (Zn)	2021/07/20	<0.10		ug/L	
			Total Zirconium (Zr)	2021/07/20	<0.10		ug/L	
A290362	AA1	RPD	Total Aluminum (Al)	2021/07/20	2.0		%	20
			Total Antimony (Sb)	2021/07/20	5.1		%	20
			Total Arsenic (As)	2021/07/20	1.3		%	20
			Total Barium (Ba)	2021/07/20	0.029		%	20
			Total Beryllium (Be)	2021/07/20	14		%	20
			Total Bismuth (Bi)	2021/07/20	NC		%	20
			Total Boron (B)	2021/07/20	NC		%	20

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Cadmium (Cd)	2021/07/20	16		%	20
			Total Chromium (Cr)	2021/07/20	NC		%	20
			Total Cobalt (Co)	2021/07/20	6.3		%	20
			Total Copper (Cu)	2021/07/20	0.68		%	20
			Total Iron (Fe)	2021/07/20	1.8		%	20
			Total Lead (Pb)	2021/07/20	NC		%	20
			Total Lithium (Li)	2021/07/20	2.5		%	20
			Total Manganese (Mn)	2021/07/20	1.7		%	20
			Total Molybdenum (Mo)	2021/07/20	3.8		%	20
			Total Nickel (Ni)	2021/07/20	1.6		%	20
			Total Phosphorus (P)	2021/07/20	NC		%	20
			Total Selenium (Se)	2021/07/20	3.9		%	20
			Total Silicon (Si)	2021/07/20	2.3		%	20
			Total Silver (Ag)	2021/07/20	NC		%	20
			Total Strontium (Sr)	2021/07/20	3.5		%	20
			Total Thallium (Tl)	2021/07/20	NC		%	20
			Total Tin (Sn)	2021/07/20	NC		%	20
			Total Titanium (Ti)	2021/07/20	NC		%	20
			Total Uranium (U)	2021/07/20	0.55		%	20
			Total Vanadium (V)	2021/07/20	NC		%	20
			Total Zinc (Zn)	2021/07/20	0.73		%	20
			Total Zirconium (Zr)	2021/07/20	NC		%	20
			Total Aluminum (Al)	2021/07/20	NC		%	20
			Total Antimony (Sb)	2021/07/20	NC		%	20
			Total Arsenic (As)	2021/07/20	NC		%	20
			Total Barium (Ba)	2021/07/20	2.7		%	20
			Total Beryllium (Be)	2021/07/20	NC		%	20
			Total Bismuth (Bi)	2021/07/20	NC		%	20
			Total Boron (B)	2021/07/20	NC		%	20
			Total Cadmium (Cd)	2021/07/20	NC		%	20
			Total Chromium (Cr)	2021/07/20	NC		%	20
			Total Cobalt (Co)	2021/07/20	NC		%	20
			Total Copper (Cu)	2021/07/20	NC		%	20
			Total Iron (Fe)	2021/07/20	NC		%	20
			Total Lead (Pb)	2021/07/20	NC		%	20
			Total Lithium (Li)	2021/07/20	NC		%	20
			Total Manganese (Mn)	2021/07/20	NC		%	20
			Total Molybdenum (Mo)	2021/07/20	NC		%	20
			Total Nickel (Ni)	2021/07/20	NC		%	20
			Total Phosphorus (P)	2021/07/20	NC		%	20
			Total Selenium (Se)	2021/07/20	NC		%	20
			Total Silicon (Si)	2021/07/20	NC		%	20
			Total Silver (Ag)	2021/07/20	NC		%	20
			Total Strontium (Sr)	2021/07/20	4.2		%	20
			Total Thallium (Tl)	2021/07/20	NC		%	20
			Total Tin (Sn)	2021/07/20	NC		%	20
			Total Titanium (Ti)	2021/07/20	NC		%	20
			Total Uranium (U)	2021/07/20	NC		%	20
			Total Vanadium (V)	2021/07/20	NC		%	20
			Total Zinc (Zn)	2021/07/20	NC		%	20
			Total Zirconium (Zr)	2021/07/20	NC		%	20
A290697	TMU	Matrix Spike	Strong Acid Dissoc. Cyanide (CN)	2021/07/20		99	%	80 - 120
A290697	TMU	Spiked Blank	Strong Acid Dissoc. Cyanide (CN)	2021/07/20		96	%	80 - 120
A290697	TMU	Method Blank	Strong Acid Dissoc. Cyanide (CN)	2021/07/20	<0.00050		mg/L	
A290697	TMU	RPD	Strong Acid Dissoc. Cyanide (CN)	2021/07/20	NC		%	20

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A290700	TMU	Matrix Spike	Weak Acid Dissoc. Cyanide (CN)	2021/07/20		97	%	80 - 120
A290700	TMU	Spiked Blank	Weak Acid Dissoc. Cyanide (CN)	2021/07/20		98	%	80 - 120
A290700	TMU	Method Blank	Weak Acid Dissoc. Cyanide (CN)	2021/07/20	<0.00050		mg/L	
A290700	TMU	RPD	Weak Acid Dissoc. Cyanide (CN)	2021/07/20	11		%	20
A290867	AA1	Matrix Spike	Dissolved Aluminum (Al)	2021/07/20		102	%	80 - 120
			Dissolved Antimony (Sb)	2021/07/20		105	%	80 - 120
			Dissolved Arsenic (As)	2021/07/20		102	%	80 - 120
			Dissolved Barium (Ba)	2021/07/20		97	%	80 - 120
			Dissolved Beryllium (Be)	2021/07/20		100	%	80 - 120
			Dissolved Bismuth (Bi)	2021/07/20		97	%	80 - 120
			Dissolved Boron (B)	2021/07/20		109	%	80 - 120
			Dissolved Cadmium (Cd)	2021/07/20		101	%	80 - 120
			Dissolved Chromium (Cr)	2021/07/20		97	%	80 - 120
			Dissolved Cobalt (Co)	2021/07/20		95	%	80 - 120
			Dissolved Copper (Cu)	2021/07/20		88	%	80 - 120
			Dissolved Iron (Fe)	2021/07/20		93	%	80 - 120
			Dissolved Lead (Pb)	2021/07/20		97	%	80 - 120
			Dissolved Lithium (Li)	2021/07/20		97	%	80 - 120
			Dissolved Manganese (Mn)	2021/07/20		NC	%	80 - 120
			Dissolved Molybdenum (Mo)	2021/07/20		106	%	80 - 120
			Dissolved Nickel (Ni)	2021/07/20		92	%	80 - 120
			Dissolved Phosphorus (P)	2021/07/20		102	%	80 - 120
			Dissolved Selenium (Se)	2021/07/20		99	%	80 - 120
			Dissolved Silicon (Si)	2021/07/20		93	%	80 - 120
			Dissolved Silver (Ag)	2021/07/20		100	%	80 - 120
			Dissolved Strontium (Sr)	2021/07/20		NC	%	80 - 120
			Dissolved Thallium (Tl)	2021/07/20		99	%	80 - 120
			Dissolved Tin (Sn)	2021/07/20		105	%	80 - 120
			Dissolved Titanium (Ti)	2021/07/20		101	%	80 - 120
			Dissolved Uranium (U)	2021/07/20		104	%	80 - 120
			Dissolved Vanadium (V)	2021/07/20		100	%	80 - 120
			Dissolved Zinc (Zn)	2021/07/20		94	%	80 - 120
			Dissolved Zirconium (Zr)	2021/07/20		108	%	80 - 120
A290867	AA1	Spiked Blank	Dissolved Aluminum (Al)	2021/07/20		102	%	80 - 120
			Dissolved Antimony (Sb)	2021/07/20		100	%	80 - 120
			Dissolved Arsenic (As)	2021/07/20		97	%	80 - 120
			Dissolved Barium (Ba)	2021/07/20		99	%	80 - 120
			Dissolved Beryllium (Be)	2021/07/20		97	%	80 - 120
			Dissolved Bismuth (Bi)	2021/07/20		99	%	80 - 120
			Dissolved Boron (B)	2021/07/20		105	%	80 - 120
			Dissolved Cadmium (Cd)	2021/07/20		99	%	80 - 120
			Dissolved Chromium (Cr)	2021/07/20		99	%	80 - 120
			Dissolved Cobalt (Co)	2021/07/20		100	%	80 - 120
			Dissolved Copper (Cu)	2021/07/20		91	%	80 - 120
			Dissolved Iron (Fe)	2021/07/20		101	%	80 - 120
			Dissolved Lead (Pb)	2021/07/20		98	%	80 - 120
			Dissolved Lithium (Li)	2021/07/20		101	%	80 - 120
			Dissolved Manganese (Mn)	2021/07/20		98	%	80 - 120
			Dissolved Molybdenum (Mo)	2021/07/20		101	%	80 - 120
			Dissolved Nickel (Ni)	2021/07/20		98	%	80 - 120
			Dissolved Phosphorus (P)	2021/07/20		98	%	80 - 120
			Dissolved Selenium (Se)	2021/07/20		96	%	80 - 120
			Dissolved Silicon (Si)	2021/07/20		104	%	80 - 120
			Dissolved Silver (Ag)	2021/07/20		96	%	80 - 120
			Dissolved Strontium (Sr)	2021/07/20		98	%	80 - 120

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Thallium (Tl)	2021/07/20		99	%	80 - 120
			Dissolved Tin (Sn)	2021/07/20		100	%	80 - 120
			Dissolved Titanium (Ti)	2021/07/20		102	%	80 - 120
			Dissolved Uranium (U)	2021/07/20		100	%	80 - 120
			Dissolved Vanadium (V)	2021/07/20		99	%	80 - 120
			Dissolved Zinc (Zn)	2021/07/20		101	%	80 - 120
			Dissolved Zirconium (Zr)	2021/07/20		98	%	80 - 120
A290867	AA1	Method Blank	Dissolved Aluminum (Al)	2021/07/20	<0.50		ug/L	
			Dissolved Antimony (Sb)	2021/07/20	<0.020		ug/L	
			Dissolved Arsenic (As)	2021/07/20	<0.020		ug/L	
			Dissolved Barium (Ba)	2021/07/20	<0.020		ug/L	
			Dissolved Beryllium (Be)	2021/07/20	<0.010		ug/L	
			Dissolved Bismuth (Bi)	2021/07/20	<0.0050		ug/L	
			Dissolved Boron (B)	2021/07/20	<10		ug/L	
			Dissolved Cadmium (Cd)	2021/07/20	<0.0050		ug/L	
			Dissolved Chromium (Cr)	2021/07/20	<0.10		ug/L	
			Dissolved Cobalt (Co)	2021/07/20	<0.0050		ug/L	
			Dissolved Copper (Cu)	2021/07/20	<0.050		ug/L	
			Dissolved Iron (Fe)	2021/07/20	<1.0		ug/L	
			Dissolved Lead (Pb)	2021/07/20	<0.0050		ug/L	
			Dissolved Lithium (Li)	2021/07/20	<0.50		ug/L	
			Dissolved Manganese (Mn)	2021/07/20	<0.050		ug/L	
			Dissolved Molybdenum (Mo)	2021/07/20	<0.050		ug/L	
			Dissolved Nickel (Ni)	2021/07/20	<0.020		ug/L	
			Dissolved Phosphorus (P)	2021/07/20	<2.0		ug/L	
			Dissolved Selenium (Se)	2021/07/20	<0.040		ug/L	
			Dissolved Silicon (Si)	2021/07/20	<50		ug/L	
			Dissolved Silver (Ag)	2021/07/20	<0.0050		ug/L	
			Dissolved Strontium (Sr)	2021/07/20	<0.050		ug/L	
			Dissolved Thallium (Tl)	2021/07/20	<0.0020		ug/L	
			Dissolved Tin (Sn)	2021/07/20	<0.20		ug/L	
			Dissolved Titanium (Ti)	2021/07/20	<0.50		ug/L	
			Dissolved Uranium (U)	2021/07/20	<0.0020		ug/L	
			Dissolved Vanadium (V)	2021/07/20	<0.20		ug/L	
			Dissolved Zinc (Zn)	2021/07/20	<0.10		ug/L	
			Dissolved Zirconium (Zr)	2021/07/20	<0.10		ug/L	
A290867	AA1	RPD	Dissolved Aluminum (Al)	2021/07/20	NC		%	20
			Dissolved Antimony (Sb)	2021/07/20	0.041		%	20
			Dissolved Arsenic (As)	2021/07/20	0.17		%	20
			Dissolved Barium (Ba)	2021/07/20	0.67		%	20
			Dissolved Beryllium (Be)	2021/07/20	NC		%	20
			Dissolved Bismuth (Bi)	2021/07/20	NC		%	20
			Dissolved Boron (B)	2021/07/20	NC		%	20
			Dissolved Cadmium (Cd)	2021/07/20	7.3		%	20
			Dissolved Chromium (Cr)	2021/07/20	NC		%	20
			Dissolved Cobalt (Co)	2021/07/20	0.0012		%	20
			Dissolved Copper (Cu)	2021/07/20	3.6		%	20
			Dissolved Iron (Fe)	2021/07/20	0.25		%	20
			Dissolved Lead (Pb)	2021/07/20	NC		%	20
			Dissolved Lithium (Li)	2021/07/20	1.2		%	20
			Dissolved Manganese (Mn)	2021/07/20	0.82		%	20
			Dissolved Molybdenum (Mo)	2021/07/20	0.14		%	20
			Dissolved Nickel (Ni)	2021/07/20	0.067		%	20
			Dissolved Phosphorus (P)	2021/07/20	3.1		%	20
			Dissolved Selenium (Se)	2021/07/20	1.9		%	20

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Dissolved Silicon (Si)	2021/07/20	0.47		%	20
			Dissolved Silver (Ag)	2021/07/20	NC		%	20
			Dissolved Strontium (Sr)	2021/07/20	0.60		%	20
			Dissolved Thallium (Tl)	2021/07/20	0.57		%	20
			Dissolved Tin (Sn)	2021/07/20	NC		%	20
			Dissolved Titanium (Ti)	2021/07/20	NC		%	20
			Dissolved Uranium (U)	2021/07/20	1.5		%	20
			Dissolved Vanadium (V)	2021/07/20	NC		%	20
			Dissolved Zinc (Zn)	2021/07/20	2.6		%	20
			Dissolved Zirconium (Zr)	2021/07/20	NC		%	20
A291083	MO5	Matrix Spike	Dissolved Chloride (Cl)	2021/07/20		101	%	80 - 120
			Dissolved Sulphate (SO4)	2021/07/20		NC	%	80 - 120
A291083	MO5	Spiked Blank	Dissolved Chloride (Cl)	2021/07/20		102	%	80 - 120
			Dissolved Sulphate (SO4)	2021/07/20		103	%	80 - 120
A291083	MO5	Method Blank	Dissolved Chloride (Cl)	2021/07/20	<0.50		mg/L	
			Dissolved Sulphate (SO4)	2021/07/20	0.90, RDL=0.50		mg/L	
A291083	MO5	RPD	Dissolved Chloride (Cl)	2021/07/20	NC		%	20
			Dissolved Sulphate (SO4)	2021/07/20	3.5		%	20
A291762	AA1	Matrix Spike	Total Aluminum (Al)	2021/07/20		138 (1)	%	80 - 120
			Total Antimony (Sb)	2021/07/20		105	%	80 - 120
			Total Arsenic (As)	2021/07/20		104	%	80 - 120
			Total Barium (Ba)	2021/07/20		103	%	80 - 120
			Total Beryllium (Be)	2021/07/20		99	%	80 - 120
			Total Bismuth (Bi)	2021/07/20		99	%	80 - 120
			Total Boron (B)	2021/07/20		100	%	80 - 120
			Total Cadmium (Cd)	2021/07/20		104	%	80 - 120
			Total Chromium (Cr)	2021/07/20		100	%	80 - 120
			Total Cobalt (Co)	2021/07/20		99	%	80 - 120
			Total Copper (Cu)	2021/07/20		102	%	80 - 120
			Total Iron (Fe)	2021/07/20		NC	%	80 - 120
			Total Lead (Pb)	2021/07/20		102	%	80 - 120
			Total Lithium (Li)	2021/07/20		99	%	80 - 120
			Total Manganese (Mn)	2021/07/20		NC	%	80 - 120
			Total Molybdenum (Mo)	2021/07/20		110	%	80 - 120
			Total Nickel (Ni)	2021/07/20		97	%	80 - 120
			Total Phosphorus (P)	2021/07/20		104	%	80 - 120
			Total Selenium (Se)	2021/07/20		106	%	80 - 120
			Total Silicon (Si)	2021/07/20		NC	%	80 - 120
			Total Silver (Ag)	2021/07/20		103	%	80 - 120
			Total Strontium (Sr)	2021/07/20		NC	%	80 - 120
			Total Thallium (Tl)	2021/07/20		102	%	80 - 120
			Total Tin (Sn)	2021/07/20		104	%	80 - 120
			Total Titanium (Ti)	2021/07/20		124 (1)	%	80 - 120
			Total Uranium (U)	2021/07/20		107	%	80 - 120
			Total Vanadium (V)	2021/07/20		103	%	80 - 120
			Total Zinc (Zn)	2021/07/20		88	%	80 - 120
			Total Zirconium (Zr)	2021/07/20		111	%	80 - 120
A291762	AA1	Spiked Blank	Total Aluminum (Al)	2021/07/20		102	%	80 - 120
			Total Antimony (Sb)	2021/07/20		105	%	80 - 120
			Total Arsenic (As)	2021/07/20		102	%	80 - 120
			Total Barium (Ba)	2021/07/20		100	%	80 - 120
			Total Beryllium (Be)	2021/07/20		101	%	80 - 120
			Total Bismuth (Bi)	2021/07/20		99	%	80 - 120
			Total Boron (B)	2021/07/20		101	%	80 - 120

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Cadmium (Cd)	2021/07/20		105	%	80 - 120
			Total Chromium (Cr)	2021/07/20		99	%	80 - 120
			Total Cobalt (Co)	2021/07/20		100	%	80 - 120
			Total Copper (Cu)	2021/07/20		101	%	80 - 120
			Total Iron (Fe)	2021/07/20		103	%	80 - 120
			Total Lead (Pb)	2021/07/20		101	%	80 - 120
			Total Lithium (Li)	2021/07/20		104	%	80 - 120
			Total Manganese (Mn)	2021/07/20		99	%	80 - 120
			Total Molybdenum (Mo)	2021/07/20		104	%	80 - 120
			Total Nickel (Ni)	2021/07/20		99	%	80 - 120
			Total Phosphorus (P)	2021/07/20		101	%	80 - 120
			Total Selenium (Se)	2021/07/20		104	%	80 - 120
			Total Silicon (Si)	2021/07/20		101	%	80 - 120
			Total Silver (Ag)	2021/07/20		104	%	80 - 120
			Total Strontium (Sr)	2021/07/20		103	%	80 - 120
			Total Thallium (Tl)	2021/07/20		102	%	80 - 120
			Total Tin (Sn)	2021/07/20		104	%	80 - 120
			Total Titanium (Ti)	2021/07/20		105	%	80 - 120
			Total Uranium (U)	2021/07/20		106	%	80 - 120
			Total Vanadium (V)	2021/07/20		101	%	80 - 120
			Total Zinc (Zn)	2021/07/20		101	%	80 - 120
			Total Zirconium (Zr)	2021/07/20		106	%	80 - 120
A291762	AA1	Method Blank	Total Aluminum (Al)	2021/07/21	<3.0		ug/L	
			Total Antimony (Sb)	2021/07/21	<0.020		ug/L	
			Total Arsenic (As)	2021/07/21	<0.020		ug/L	
			Total Barium (Ba)	2021/07/21	<0.050		ug/L	
			Total Beryllium (Be)	2021/07/21	<0.010		ug/L	
			Total Bismuth (Bi)	2021/07/21	<0.010		ug/L	
			Total Boron (B)	2021/07/21	<10		ug/L	
			Total Cadmium (Cd)	2021/07/21	<0.0050		ug/L	
			Total Chromium (Cr)	2021/07/21	<0.10		ug/L	
			Total Cobalt (Co)	2021/07/21	<0.010		ug/L	
			Total Copper (Cu)	2021/07/21	<0.10		ug/L	
			Total Iron (Fe)	2021/07/21	<5.0		ug/L	
			Total Lead (Pb)	2021/07/21	<0.020		ug/L	
			Total Lithium (Li)	2021/07/21	<0.50		ug/L	
			Total Manganese (Mn)	2021/07/21	<0.10		ug/L	
			Total Molybdenum (Mo)	2021/07/21	<0.050		ug/L	
			Total Nickel (Ni)	2021/07/21	<0.10		ug/L	
			Total Phosphorus (P)	2021/07/21	<5.0		ug/L	
			Total Selenium (Se)	2021/07/21	<0.040		ug/L	
			Total Silicon (Si)	2021/07/21	<50		ug/L	
			Total Silver (Ag)	2021/07/21	<0.010		ug/L	
			Total Strontium (Sr)	2021/07/21	<0.050		ug/L	
			Total Thallium (Tl)	2021/07/21	<0.0020		ug/L	
			Total Tin (Sn)	2021/07/21	<0.20		ug/L	
			Total Titanium (Ti)	2021/07/21	<2.0		ug/L	
			Total Uranium (U)	2021/07/21	<0.0050		ug/L	
			Total Vanadium (V)	2021/07/21	<0.20		ug/L	
			Total Zinc (Zn)	2021/07/21	<1.0		ug/L	
			Total Zirconium (Zr)	2021/07/21	<0.10		ug/L	
A291762	AA1	RPD	Total Aluminum (Al)	2021/07/21	19		%	20
			Total Antimony (Sb)	2021/07/21	9.8		%	20
			Total Arsenic (As)	2021/07/21	5.5		%	20
			Total Barium (Ba)	2021/07/21	0.57		%	20

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
			Total Beryllium (Be)	2021/07/21	NC		%	20
			Total Bismuth (Bi)	2021/07/21	NC		%	20
			Total Boron (B)	2021/07/21	NC		%	20
			Total Cadmium (Cd)	2021/07/21	NC		%	20
			Total Chromium (Cr)	2021/07/21	15		%	20
			Total Cobalt (Co)	2021/07/21	8.5		%	20
			Total Copper (Cu)	2021/07/21	5.6		%	20
			Total Iron (Fe)	2021/07/21	1.3		%	20
			Total Lead (Pb)	2021/07/21	16		%	20
			Total Lithium (Li)	2021/07/21	0.58		%	20
			Total Manganese (Mn)	2021/07/21	3.3		%	20
			Total Molybdenum (Mo)	2021/07/21	NC		%	20
			Total Nickel (Ni)	2021/07/21	8.4		%	20
			Total Phosphorus (P)	2021/07/21	9.4		%	20
			Total Selenium (Se)	2021/07/21	6.6		%	20
			Total Silicon (Si)	2021/07/21	3.7		%	20
			Total Silver (Ag)	2021/07/21	NC		%	20
			Total Strontium (Sr)	2021/07/21	0.036		%	20
			Total Thallium (Tl)	2021/07/21	NC		%	20
			Total Tin (Sn)	2021/07/21	NC		%	20
			Total Titanium (Ti)	2021/07/21	16		%	20
			Total Uranium (U)	2021/07/21	0.65		%	20
			Total Vanadium (V)	2021/07/21	12		%	20
			Total Zinc (Zn)	2021/07/21	1.5		%	20
			Total Zirconium (Zr)	2021/07/21	13		%	20
A291920	KMG	Spiked Blank	pH (15 C)	2021/07/20		100	%	97 - 103
A291920	KMG	RPD	pH (15 C)	2021/07/20	0.40		%	N/A
A292089	BO3	Spiked Blank	pH	2021/07/19		101	%	97 - 103
A292089	BO3	RPD	pH	2021/07/19	0.26		%	N/A
A292089	BO3	RPD [ABY052-02]	pH	2021/07/19	1.7		%	N/A
A292091	BO3	Matrix Spike [ABY052-02]	Alkalinity (Total as CaCO3)	2021/07/19		NC	%	80 - 120
A292091	BO3	Spiked Blank	Alkalinity (Total as CaCO3)	2021/07/19		95	%	80 - 120
A292091	BO3	Method Blank	Alkalinity (PP as CaCO3)	2021/07/19	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2021/07/19	<1.0		mg/L	
			Bicarbonate (HCO3)	2021/07/19	<1.0		mg/L	
			Carbonate (CO3)	2021/07/19	<1.0		mg/L	
			Hydroxide (OH)	2021/07/19	<1.0		mg/L	
A292091	BO3	RPD	Alkalinity (PP as CaCO3)	2021/07/19	NC		%	20
			Alkalinity (Total as CaCO3)	2021/07/19	1.2		%	20
			Bicarbonate (HCO3)	2021/07/19	1.2		%	20
			Carbonate (CO3)	2021/07/19	NC		%	20
			Hydroxide (OH)	2021/07/19	NC		%	20
A292091	BO3	RPD [ABY052-02]	Alkalinity (PP as CaCO3)	2021/07/19	NC		%	20
			Alkalinity (Total as CaCO3)	2021/07/19	0.82		%	20
			Bicarbonate (HCO3)	2021/07/19	0.82		%	20
			Carbonate (CO3)	2021/07/19	NC		%	20
			Hydroxide (OH)	2021/07/19	NC		%	20
A292092	BO3	Spiked Blank	Conductivity	2021/07/19		97	%	80 - 120
A292092	BO3	Method Blank	Conductivity	2021/07/19	<2.0		uS/cm	
A292092	BO3	RPD	Conductivity	2021/07/19	0.84		%	10
A292092	BO3	RPD [ABY052-02]	Conductivity	2021/07/19	0.68		%	10
A292093	BO3	Spiked Blank	pH	2021/07/19		101	%	97 - 103
A292093	BO3	RPD	pH	2021/07/20	1.7		%	N/A
A292094	BO3	Matrix Spike	Alkalinity (Total as CaCO3)	2021/07/20		NC	%	80 - 120
A292094	BO3	Spiked Blank	Alkalinity (Total as CaCO3)	2021/07/19		95	%	80 - 120

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A292094	BO3	Method Blank	Alkalinity (PP as CaCO3)	2021/07/19	<1.0		mg/L	
			Alkalinity (Total as CaCO3)	2021/07/19	<1.0		mg/L	
			Bicarbonate (HCO3)	2021/07/19	<1.0		mg/L	
			Carbonate (CO3)	2021/07/19	<1.0		mg/L	
			Hydroxide (OH)	2021/07/19	<1.0		mg/L	
A292094	BO3	RPD	Alkalinity (PP as CaCO3)	2021/07/20	NC		%	20
			Alkalinity (Total as CaCO3)	2021/07/20	0.27		%	20
			Bicarbonate (HCO3)	2021/07/20	0.27		%	20
			Carbonate (CO3)	2021/07/20	NC		%	20
			Hydroxide (OH)	2021/07/20	NC		%	20
A292098	BO3	Spiked Blank	Conductivity	2021/07/19		97	%	80 - 120
A292098	BO3	Method Blank	Conductivity	2021/07/19	<2.0		uS/cm	
A292133	JC8	Matrix Spike [ABY048-07]	Total Mercury (Hg)	2021/07/20		78 (1)	%	80 - 120
A292133	JC8	Spiked Blank	Total Mercury (Hg)	2021/07/20		97	%	80 - 120
A292133	JC8	Method Blank	Total Mercury (Hg)	2021/07/20	<0.0019		ug/L	
A292133	JC8	RPD [ABY047-07]	Total Mercury (Hg)	2021/07/20	NC		%	20
A292144	JM0	Matrix Spike	Total Dissolved Solids	2021/07/20		119	%	80 - 120
A292144	JM0	Spiked Blank	Total Dissolved Solids	2021/07/20		108	%	80 - 120
A292144	JM0	Method Blank	Total Dissolved Solids	2021/07/20	<1.0		mg/L	
A292144	JM0	RPD	Total Dissolved Solids	2021/07/20	8.4		%	20
A292190	JC8	Matrix Spike	Dissolved Mercury (Hg)	2021/07/20		86	%	80 - 120
A292190	JC8	Spiked Blank	Dissolved Mercury (Hg)	2021/07/20		101	%	80 - 120
A292190	JC8	Method Blank	Dissolved Mercury (Hg)	2021/07/20	<0.0019		ug/L	
A292190	JC8	RPD	Dissolved Mercury (Hg)	2021/07/20	NC		%	20
A292230	BYM	Matrix Spike	Total Sulphide	2021/07/21		102	%	80 - 120
A292230	BYM	Spiked Blank	Total Sulphide	2021/07/21		100	%	80 - 120
A292230	BYM	Method Blank	Total Sulphide	2021/07/21	<0.0018		mg/L	
A292230	BYM	RPD	Total Sulphide	2021/07/21	8.0		%	20
A292472	LDH	Matrix Spike	Total Nitrogen (N)	2021/07/21		NC	%	80 - 120
A292472	LDH	Spiked Blank	Total Nitrogen (N)	2021/07/21		100	%	80 - 120
A292472	LDH	Method Blank	Total Nitrogen (N)	2021/07/21	<0.020		mg/L	
A292472	LDH	RPD	Total Nitrogen (N)	2021/07/21	0.47		%	20
A292683	BYM	Matrix Spike [ABY054-13]	Total Sulphide	2021/07/21		119	%	80 - 120
A292683	BYM	Spiked Blank	Total Sulphide	2021/07/21		88	%	80 - 120
A292683	BYM	Method Blank	Total Sulphide	2021/07/21	<0.0018		mg/L	
A292683	BYM	RPD	Total Sulphide	2021/07/21	NC		%	20
A292997	TMU	Matrix Spike	Strong Acid Dissoc. Cyanide (CN)	2021/07/21		116	%	80 - 120
A292997	TMU	Spiked Blank	Strong Acid Dissoc. Cyanide (CN)	2021/07/21		110	%	80 - 120
A292997	TMU	Method Blank	Strong Acid Dissoc. Cyanide (CN)	2021/07/21	<0.00050		mg/L	
A292997	TMU	RPD	Strong Acid Dissoc. Cyanide (CN)	2021/07/21	NC		%	20
A293007	TMU	Matrix Spike	Weak Acid Dissoc. Cyanide (CN)	2021/07/21		99	%	80 - 120
A293007	TMU	Spiked Blank	Weak Acid Dissoc. Cyanide (CN)	2021/07/21		99	%	80 - 120
A293007	TMU	Method Blank	Weak Acid Dissoc. Cyanide (CN)	2021/07/21	<0.00050		mg/L	
A293007	TMU	RPD	Weak Acid Dissoc. Cyanide (CN)	2021/07/21	NC		%	20
A293012	TMU	Matrix Spike	Strong Acid Dissoc. Cyanide (CN)	2021/07/21		104	%	80 - 120
A293012	TMU	Spiked Blank	Strong Acid Dissoc. Cyanide (CN)	2021/07/21		112	%	80 - 120
A293012	TMU	Method Blank	Strong Acid Dissoc. Cyanide (CN)	2021/07/21	<0.00050		mg/L	
A293012	TMU	RPD	Strong Acid Dissoc. Cyanide (CN)	2021/07/21	0		%	20
A293013	TMU	Matrix Spike	Weak Acid Dissoc. Cyanide (CN)	2021/07/21		96	%	80 - 120
A293013	TMU	Spiked Blank	Weak Acid Dissoc. Cyanide (CN)	2021/07/21		94	%	80 - 120
A293013	TMU	Method Blank	Weak Acid Dissoc. Cyanide (CN)	2021/07/21	<0.00050		mg/L	
A293013	TMU	RPD	Weak Acid Dissoc. Cyanide (CN)	2021/07/21	NC		%	20
A293243	SKM	Matrix Spike	Total Ammonia (N)	2021/07/21		104	%	80 - 120
A293243	SKM	Spiked Blank	Total Ammonia (N)	2021/07/21		102	%	80 - 120
A293243	SKM	Method Blank	Total Ammonia (N)	2021/07/21	<0.0050		mg/L	

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

QUALITY ASSURANCE REPORT(CONT'D)

QA/QC Batch	Init	QC Type	Parameter	Date Analyzed	Value	Recovery	UNITS	QC Limits
A293243	SKM	RPD	Total Ammonia (N)	2021/07/21	NC		%	20
A293247	SKM	Matrix Spike	Total Ammonia (N)	2021/07/21		102	%	80 - 120
A293247	SKM	Spiked Blank	Total Ammonia (N)	2021/07/21		101	%	80 - 120
A293247	SKM	Method Blank	Total Ammonia (N)	2021/07/21	<0.0050		mg/L	
A293247	SKM	RPD	Total Ammonia (N)	2021/07/21	NC		%	20
A293312	BTM	Matrix Spike [ABY049-01]	Total Suspended Solids	2021/07/22		106	%	80 - 120
A293312	BTM	Spiked Blank	Total Suspended Solids	2021/07/22		102	%	80 - 120
A293312	BTM	Method Blank	Total Suspended Solids	2021/07/22	<1.0		mg/L	
A293312	BTM	RPD [ABY048-01]	Total Suspended Solids	2021/07/22	NC		%	20
A293318	BTM	Matrix Spike	Total Suspended Solids	2021/07/22		103	%	80 - 120
A293318	BTM	Spiked Blank	Total Suspended Solids	2021/07/22		103	%	80 - 120
A293318	BTM	Method Blank	Total Suspended Solids	2021/07/22	<1.0		mg/L	
A293318	BTM	RPD	Total Suspended Solids	2021/07/22	NC		%	20
A293321	BTM	Matrix Spike	Total Suspended Solids	2021/07/22		107	%	80 - 120
A293321	BTM	Spiked Blank	Total Suspended Solids	2021/07/22		101	%	80 - 120
A293321	BTM	Method Blank	Total Suspended Solids	2021/07/22	<1.0		mg/L	
A293321	BTM	RPD	Total Suspended Solids	2021/07/22	NC		%	20
A296341	ZWU	Matrix Spike	Dissolved Organic Carbon (C)	2021/07/24		109	%	80 - 120
A296341	ZWU	Spiked Blank	Dissolved Organic Carbon (C)	2021/07/24		110	%	80 - 120
A296341	ZWU	Method Blank	Dissolved Organic Carbon (C)	2021/07/24	<0.20		mg/L	
A296341	ZWU	RPD	Dissolved Organic Carbon (C)	2021/07/24	0.85		%	20

N/A = Not Applicable

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

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

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

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

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

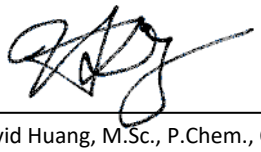
NC (Duplicate RPD): The duplicate RPD was not calculated. The concentration in the sample and/or duplicate was too low to permit a reliable RPD calculation (absolute difference <= 2x RDL).

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

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

VALIDATION SIGNATURE PAGE

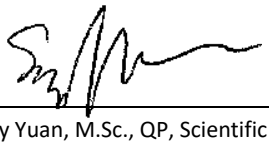
The analytical data and all QC contained in this report were reviewed and validated by:



David Huang, M.Sc., P.Chem., QP, Scientific Services Manager

Ghayasuddin Khan, M.Sc., P.Chem., QP, Scientific Specialist, Inorganics

Maria Magdalena Florescu, Ph.Ď., P.Chem., QP, Inorganics Manager



Sandy Yuan, M.Sc., QP, Scientific Specialist

BV Labs has procedures in place to guard against improper use of the electronic signature and have the required "signatories", as per ISO/IEC 17025, signing the reports.
For Service Group specific validation please refer to the Validation Signature Page.

Bureau Veritas Laboratories Burnaby: 4606 Canada Way V5G 1K5 Telephone(604) 734-7276 Fax(604) 731-2386

Bureau Veritas Laboratories
4000 19st N.E. Calgary, Alberta Canada T2E 6P8 Tel (403) 291-3077 Toll-free 800-563-6266 Fax (403) 291-9468 www.bvlabs.com

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#13592 Government of Yukon	Company Name	#44232 Government of Yukon	Quotation #	C10319	BV Labs Job #	Bottle Order #:
Contact Name	Devon O'Connor	Contact Name	Devon O'Connor	P.O. #		C150922	640722
Address	Financial Svcs. Brance V-Fin Box 2703	Address	Box 2703	Project #		Chain Of Custody Record	Project Manager
	Whitehorse YT Y1A 2C6		Whitehorse AB Y1A 2C6	Project Name		C#640722-01-01	Customer Solutions
Phone	(867) 667-3102 Fax:	Phone	(867) 667-3102 Fax:	Site #			
Email	devon.o'connor@yukon.ca	Email	devon.o'connor@yukon.ca	Sampled By			

Regulatory Criteria

Special Instructions

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to BV Labs

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: Time Required: ☐
Rush Confirmation Number: (call lab for #)

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y / N)	Metals Field Filtered ? (Y / N)	Low Level Dissolved Metals with CV Hg	Low Level Total Metals with CV Hg	Ammonia+Cyanate_N	Carbon (DOC)	Conductivity @25C	Cyanide SAD (strong acid dissociable)	Cyanide WAD (weak acid dissociable)	Low level chloride/sulphate by AC	Nitrate+Nitrite (N) (low level)	Nitrogen - Nitrate (as N) Low Level Calc	# of Bottles	Comments
1		DC-DX-105-R	July 14, 2021	14:00	W	N	Y	X	X	X	X	X	X	X	X	X	X		
2		DC-DX-105	"	13:15	"	"	"	X	X	X	X	X	X	X	X	X	X		
3		MS-P	"	13:30	"	"	"	X	X	X	X	X	X	X	X	X	X		
4		DC-8	"	13:10	"	"	"	X	X	X	X	X	X	X	X	X	X		
5		MS-ROAD	"	11:15	"	"	"	X	X	X	X	X	X	X	X	X	X		
6		DC-DX	"	9:05	"	"	"	X	X	X	X	X	X	X	X	X	X		
7		MS-S-03	"	9:55	"	"	"	X	X	X	X	X	X	X	X	X	X		
8		DC-15	"	10:30	"	"	"	X	X	X	X	X	X	X	X	X	X		
9								X	X	X	X	X	X	X	X	X	X		
10								X	X	X	X	X	X	X	X	X	X		

C150922_COC

RECEIVED IN WHITEHORSE
BY: M.Duncan 1230
2021-07-15
TEMP: 6 6 7 / 4 5 6

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
Devon O'Connor	21/07/15	12:30	FEDEX NGH	2021/07/16	15:30		☐	9.6 6 / 7.7.7	☑ Yes ☐

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.

* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: BV Labs Yellow: Client

MVO 2021/07/16.

Bureau Veritas Laboratories
4000 19st N E, Calgary, Alberta Canada T2E 6P8 Tel (403) 291-3077 Toll-free 800-563-6266 Fax (403) 291-9468 www.bvlabs.com

Chain Of Custody Record

INVOICE TO:		Report Information		Project Information		Laboratory Use Only	
Company Name	#13592 Government of Yukon	Company Name	#44232 Government of Yukon	Quotation #	C10319	BV Labs Job #	Bottle Order #:
Contact Name	Devon O'Connor	Contact Name	Devon O'Connor	P.O. #		C150922	640722
Address	Financial Svcs. Brance V-Fin Box 2703	Address	Box 2703	Project #		Chain Of Custody Record	Project Manager
	Whitehorse YT Y1A 2C6		Whitehorse AB Y1A 2C6	Project Name		C#640722-01-02	Customer Solutions
Phone	(867) 667-3102 Fax:	Phone	(867) 667-3102 Fax:	Site #			
Email	devon.o'connor@yukon.ca	Email	devon.o'connor@yukon.ca	Sampled By			

Regulatory Criteria

Special Instructions

Note: For regulated drinking water samples - please use the Drinking Water Chain of Custody Form

Samples must be kept cool (< 10°C) from time of sampling until delivery to BV Labs

Turnaround Time (TAT) Required

Please provide advance notice for rush projects

Regular (Standard) TAT ☒
(will be applied if Rush TAT is not specified)
Standard TAT = 5-7 Working days for most tests.
Please note: Standard TAT for certain tests such as BOD and Dioxins/Furans are > 5 days - contact your Project Manager for details.

Job Specific Rush TAT (if applies to entire submission)
Date Required: _____ Time Required: _____
Rush Confirmation Number: _____ (call lab for #) ☐

	Sample Barcode Label	Sample (Location) Identification	Date Sampled	Time Sampled	Matrix	Regulated Drinking Water ? (Y/N)	Metals Field Filtered ? (Y/N)	Nitrogen (Total)	pH @25°C	Total Sulphide	Un-ionized Ammonia as N @ 15 C	Alkalinity @25C (pp, total), CO3,HCO3,OH	Total Suspended Solids(Fixed & Volatile)	Total Dissolved Solids - Low Level	Total Suspended Solids (NFR)			# of Bottles	Comments
1		DC-DX-105-R	July 14, 2021	14:00	W	N	Y	X	X	X	X	X		X	X				All dissolved parms. field filtered
2		DC-DX-105	"	13:15	"	"	"	X	X	X	X	X		X	X				"
3		MS-P	"	13:30	"	"	"	X	X	X	X	X		X	X				"
4		DC-8	"	13:10	"	"	"	X	X	X	X	X		X	X				"
5		MS-ROAD	"	11:15	"	"	"	X	X	X	X	X		X	X				"
6		DC-DX	"	9:05	"	"	"	X	X	X	X	X		X	X				"
7		MS-S-03	"	9:55	"	"	"	X	X	X	X	X		X	X				RECEIVED IN WHITEHORSE
8		DC-15	"	10:30	"	"	"	X	X	X	X	X		X	X				BY: JMDuncan @ 12:30
9								X	X	X	X	X		X	X				2021-07-15
10								X	X	X	X	X		X	X				6 6 7

* RELINQUISHED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	RECEIVED BY: (Signature/Print)	Date: (YY/MM/DD)	Time	# jars used and not submitted	Lab Use Only: Time Sensitive	Temperature (°C) on Receipt	Custody Seal Intact on Cooler?
Devon O'Connor	21/07/15	12:30	ALFRED NGAI	2021/07/16	15:30		☐	9.6 6.7.7	☒ Yes ☐ No

* UNLESS OTHERWISE AGREED TO IN WRITING, WORK SUBMITTED ON THIS CHAIN OF CUSTODY IS SUBJECT TO BV LABS' STANDARD TERMS AND CONDITIONS. SIGNING OF THIS CHAIN OF CUSTODY DOCUMENT IS ACKNOWLEDGMENT AND ACCEPTANCE OF OUR TERMS WHICH ARE AVAILABLE FOR VIEWING AT WWW.BVLABS.COM/TERMS-AND-CONDITIONS.
* IT IS THE RESPONSIBILITY OF THE RELINQUISHER TO ENSURE THE ACCURACY OF THE CHAIN OF CUSTODY RECORD. AN INCOMPLETE CHAIN OF CUSTODY MAY RESULT IN ANALYTICAL TAT DELAYS.

White: BV Labs Yellow: Client

Client: O'Connor/Yukon Water Resources Branch
Project: Mt. Nansen

ISO# 2021398
Location: 7-D
13 for 18O, 2H

Environmental Isotope Lab
2021-09-13

#	Sample	Date	Lab#	$\delta^{18}O$	Result	Repeat	$\delta^{2}H$	Result	Repeat		pH	EC	AZD
				H_2O	VSMOW	± 0.2‰	H_2O	VSMOW	± 0.8‰			uS/cm	
1	DC-R	14/7/2021	460562	X	-21.50	-21.44	X	-167.03	-167.49	1x100mL	7.28	1,200	
2	DC-8	14/7/2021	460563	X	-22.23		X	-171.26		1x100mL	6.80	2,700	
3	DC-DX	14/7/2021	460564	X	-21.46		X	-164.65		1x100mL	7.12	450	
4	MS-S-03	14/7/2021	460565	X	-22.37	-22.29	X	-172.51	-172.16	1x100mL	6.76	1,200	
5	DC-DX-105	14/7/2021	460566	X	-22.44		X	-172.08		1x100mL	6.90	1,200	
6	DC-U	14/7/2021	460567	X	-21.74		X	-168.97		1x100mL	7.83	1,300	
7	DC-DX-105-R	14/7/2021	460568	X	-22.53		X	-172.85		1x100mL	6.90	1,200	
8	PC-U	14/7/2021	460569	X	-21.75	-21.70	X	-168.56	-167.15	1x100mL	7.77	800	
9	DC-B	14/7/2021	460570	X	-21.76		X	-169.71		1x100mL	7.71	1,400	
10	MS-P	14/7/2021	460571	X	-21.97		X	-170.01		1x100mL	7.01	1,700	
11	DC-UVC	14/7/2021	460572	X	-21.36		X	-167.53		1x100mL	7.78	1,100	
12	MS-ROAD	14/7/2021	460573	X	-22.28	-22.25	X	-172.70	-172.75	1x100mL	7.25	1,700	
13	DC-15	14/7/2021	460574	X	-22.33		X	-173.85		1x100mL	7.19	1,200	

ENVIRONMENTAL ISOTOPE LABORATORY

YUKON WATER BOARD

Pursuant to the *Waters Act* and *Regulation*, the Yukon Water Board hereby issues a water licence to:

LICENSEE:	Mount Nansen Remediation Limited Partnership
CONTACT INFORMATION:	2600-595 Burrard Street Vancouver, BC V7X 1L3
LICENCE NUMBER:	QZ19-055
UNDERTAKING:	Quartz Mining **LICENCE TYPE:** B
WATER MANAGEMENT AREA:	02 Yukon
WATER SOURCE:	Groundwater (well near Victoria Creek)
MAXIMUM QUANTITY:	210 cubic metres of water per day
LOCATION:	Mount Nansen
MAP CO-ORDINATES:	Latitude: 62° 2’ 51” Longitude: 137° 8’ 51”
PURPOSE:	To obtain water, store water, and to deposit a Waste for the purpose of caring and maintaining the Mount Nansen mine site.
EFFECTIVE DATE:	August 19, 2021
EXPIRY DATE:	August 18, 2026

This Licence is subject to the restrictions and conditions contained herein and to the restrictions and conditions contained in the *Waters Act* and the *Waters Regulation* made thereunder.

Issued this 19th day of August, 2021.

Digitally signed
Witness

Digitally signed
Chairperson
Yukon Water Board

Table of Contents

PART A – DEFINITIONS

"Act" means the *Waters Act* S.Y. 2003, c.19, as amended from time to time.

"Application" means Water Licence Application QZ19-055, including responses to interventions, responses to information requests, transcripts, and additional submissions or revisions submitted to the Yukon Water Board by the Licensee, up to the date of the Board's decision.

"Board" means the Yukon Water Board.

"Inspector" means any person designated as an inspector under section 33(1) of the Act.

"Minor Modification" means a change to the final detailed design that does not affect its functionality and ability to meet the design criteria or environmental performance requirements and does not affect any other design or performance criteria.

"Natural Boundary" means the visible high water mark of any lake, river, stream or other body of water where the presence and action of water is so common and usual and so long continued as to mark upon the soil of the bed of the lake, river, stream or other body of water a character distinct from that of the banks thereof, both in respect to vegetation and in respect to the nature of the soil itself. In addition, the best estimates of the edge of dormant or old side channels and marsh areas are considered to be Natural Boundaries.

"Project" means the care and maintenance activities occurring on the Mount Nansen mine site as described in the Application.

"Regulation" means the *Waters Regulation*, O.I.C. 2003/58, as amended from time to time.

"Spill Contingency Plan" means the *Spill Contingency Plan* that was submitted as part of the Application and included in appendix A of exhibit 1.22 in Register QZ19-055, and any subsequent revisions.

"Tailings Storage Facility" means the tailings impoundment and dam, the seepage pond and dike, the Dome Creek diversion channel including the emergency spillway and the interceptor ditch.

"Waste" has the same meaning as "Waste" in the Act.

"Watercourse" means a natural watercourse, body of water or water supply, whether usually containing water or not, and includes groundwater, springs, swamps, and gulches.

"Wetted Perimeter" means the horizontal extent of the present water level while the work is taking place.

PART B – WATER USE AND DEPOSIT OF WASTE

1. The Licensee is hereby authorized to:
   a) Obtain a maximum quantity of 210 cubic metres of water per day from groundwater;
   b) Construct and operate a water treatment plant at a maximum flow rate of 360 cubic metres per day;
   c) Use and maintain the existing diversion of Dome Creek;
   d) Store water in the existing tailings impoundment and seepage pond;
   e) Deposit Waste in the form of untreated seepage pond water to Dome Creek until the water treatment plant has been built and commissioned;
   f) Upon commissioning of the water treatment plant, deposit Waste that meets the effluent quality standards in condition 20 of this Licence to Dome Creek;
   g) Store water treatment plant sludge by-products within the tailings facility; and
   h) Conduct care and maintenance activities related to the Tailings Storage Facility,

   as described in the Application and subject to the conditions of this Licence.

2. The Licensee is prohibited from depositing a Waste to any Watercourse, except as authorized by this Licence.

PART C- DESIGN, CONSTRUCTION AND MODIFICATION

<u>Design</u>

3. At least 30 days prior to the commencement of construction of the water treatment plant, the Licensee must submit to the Board final design drawings for the water treatment plant sealed by a professional engineer licensed to practice in Yukon. These drawings must be consistent with the preliminary design drawings submitted as part of the Application.

4. Within 90 days of completing the construction of the water treatment plant, the Licensee must submit as-built design drawings sealed by a professional engineer licensed to practice in Yukon.

5. Where site conditions require Minor Modifications to the final detailed design submitted to the Board, the Licensee must submit to the Board with the as-built drawings:
   a) written details of the Minor Modifications made to the specifications and quality assurance/quality control procedures previously submitted to the Board as part of the Application; and
   b) an explanation, signed by a professional engineer licensed to practice in Yukon, for the change, including an assessment of the potential impact on the performance of the field modification.

c) written evidence that there has not been any fundamental changes to the original design criteria as presented in the Application.

Construction and Maintenance

6. By September 20, 2021, the Licensee must submit to the Board detailed construction plans including the construction schedule for the period to March 31, 2022.

7. By April 1 of each year, the Licensee must submit to the Board detailed construction plans including the construction schedule for the coming 12 month period.

8. The Licensee must submit in writing the name and phone number of the field supervisor to the Board and Inspector, 10 days prior to the start of construction.

9. The Licensee must not operate heavy equipment within the Wetted Perimeter of any Watercourse.

10. The Licensee must stabilize disturbed ground surfaces in such a manner as to prevent erosion and surface runoff from carrying sediment into any Watercourse.

PART D - OPERATING CONDITIONS

11. By March 31 of each year, the Licensee must ensure all ditches, diversion channels and culverts are cleared of ice, snow and debris that would affect their operational capacity and be maintained free of such obstructions until at least October 31 of each year.

12. The Licensee must keep the emergency spillway clear of ice, snow and debris at all times to maintain its function and capacity.

13. Water treatment plant sludge must be managed in accordance with the Application.

PART E – PLANS

14. The Licensee must implement all plans submitted pursuant to this Licence, as well as those submitted as part of the Application.

Spill Contingency Plan

15. By November 30, 2021 the Licensee must submit to the Board an updated Spill Contingency Plan. The updated plan must include an inventory, complete with Safety Data Sheets of all chemicals being used for the Project including water treatment reagants, chemicals, fuels, oils and other hazardous materials.

Adaptive Management Plan

16. By December 20, 2021 the Licensee must submit to the Board an updated adaptive management plan. The updated plan must include:
    a) a stepped response to increase level of action should a condition triggering adaptive management persist over time;
    b) thresholds for action in response to high water level events in the Tailings Storage Facility; and
    c) an updated total arsenic water quality objective of 0.025 mg/L at DC-R.

17. By December 20, 2023 the Licensee must submit to the Board an updated adaptive management plan. The updated plan must include:
    a) A summary of all site conditions that have changed with respect to climate trends, source terms, surface water and groundwater quality and quantity, and water treatment efficacy; and
    b) An analysis of how the information in 17. a) has been considered in the setting of any updated triggers, thresholds and actions.

18. The Licensee must submit to the Board as part of the annual report the results of any actions taken related to the adaptive management plan being triggered.

Aquatic Effects Monitoring Program

19. The Licensee must submit to the Board by February 28, 2022 an updated aquatic effects monitoring program to include the requirements of this Licence.

PART F – EFFLUENT QUALITY STANDARDS

20. All discharge from the water treatment plant must meet the following effluent quality standards:

Parameter	**Maximum Concentration in a Grab Sample (in mg/L unless otherwise noted)**
pH	6.0 to 9.5 pH units
Total Suspended Solids	15
Unionized ammonia-N[1]	1.00
Arsenic (total)	0.03
Iron (total)	0.5
Manganese (total)	3.1
Zinc (total)	0.06
96-hour Rainbow Trout LC_{50} at 100% concentration[2]	Non-toxic

1. unionized ammonia shall be determined in accordance with the following formula:

$$\mathbf{A\ (1/(1 + 10^{pKa-pH}))}$$

where
A is the concentration of total ammonia — which is the sum of unionized ammonia (NH3) and ionized ammonia (NH4 +) — expressed in mg/L as nitrogen (N);
pH is the pH of the effluent sample; and
pKa is a dissociation constant calculated in accordance with the following formula:

$$\mathbf{0.09018 + 2729.92/T}$$

where
T is the temperature of the effluent sample in kelvin.

2. pH non-adjusted, Reference Method EPS 1/RM/13

21. If the analysis of an discharge sample from the water treatment plant indicates an exceedance of the effluent quality standards in condition 20, the Licensee must notify the Inspector and the Board in writing, within 24 hours of detecting the exceedance.

PART G – MONITORING AND SURVEILLANCE

Water Monitoring Program

22. The Licensee must monitor at the stations identified in Tables A1 and A2 of Schedule A for the parameters and at the frequency identified in Table A3 of Schedule A of this Licence.

23. The Licensee must conduct aquatic effects monitoring as described in the *Aquatic Effects Monitoring Program* (AEMP)*,* exhibit 1.18 of Register QZ19-055 and pursuant to the requirements in Schedule A.

24. The Licensee must submit to the Board, a detailed report highlighting the results of the aquatic effects monitoring program required by condition 23 as part of the annual report.

25. Laboratory analyses must be performed by a laboratory accredited under the International Organization for Standardization ISO/IEC 17025:2005 standard and the accreditation must include the actual tests being performed by the laboratory.

Physical Inspections and Monitoring

26. The Licensee must conduct routine physical inspections and monitoring of the Tailings Storage Facility as described in section 4.2.4 of exhibit 1.2 of Register QZ19-055 and submit to the Board as part of the annual report, a summary of the findings including all data and observations collected.

27. The Licensee must conduct twice-annual physical inspections of the Tailings Storage Facility. The inspection must be conducted by a professional engineer licensed to practice in the Yukon. A report prepared by the professional engineer must be submitted as a part of each annual report and include:

    a) documentation of the inspection locations and methodologies;

    b) the results of the inspection;

    c) analysis of thermistor data and identification of changes from previous year

    d) all problems identified;

    e) remedial measures recommended;

    f) the status of any remedial measures recommended in the previous year's report with an explanation regarding any recommendation not implemented; and

    g) actions taken or planned in response to any identified issues and/or to prevent recurrence.

28. In 2023, the Licensee must conduct a formal dam safety review of the Tailings Storage Facility to evaluation the stability, functionality, safety and risks of the tailings facility. The review must be conducted by a qualified professional engineer licensed to practice in Yukon and be conducted in accordance with the *Canadian Dam Safety Guidelines*.

29. The Licensee must submit to the Board, a report on the dam safety review required by condition 28. The report must be sealed by the professional engineer who conducted the review and detail the results of the safety review, all problems identified and remedial measures recommended. The report must be submitted as part of the 2023 annual report due March 31, 2024.

Water Treatment Plant

30. The Licensee must submit to the Board a performance evaluation report for the water treatment plant for the first year of operation. The evaluation report must be completed by a qualified person and include:

    a) an analysis of the plant's performance in terms of treatment efficiency, capacity, and compliance for all treatment constituents;

    b) the WTP commissioning plan;

    c) water quality results from the WTP commissioning; and

    d) any remedial actions taken by the Licensee.

PART H - GENERAL CONDITIONS

General

31. No condition of this Licence limits the applicability of any statutory authority.

32. The activities authorized by this Licence must occur on property that the Licensee has the right to enter upon and use.

33. The Licensee must be producible and available to staff and Inspectors on site at all times.

34. In the event that the Licensee fails to comply with any condition of this Licence, the Board may, subject to the Act, cancel the licence.

35. Subject to the conditions of this Licence, the Application forms part of this Licence.

36. Where there is a conflict between the Application and the conditions of this Licence, this Licence prevails.

Correspondence

37. Where any direction, notice, order or report under this Licence is required to be in writing, it shall be given to the Licensee, if delivered, mailed or mailed by registered mail, to the address identified on page 1 of this Licence, and shall be deemed to have been given to the Licensee on the day it was delivered or e-mailed or 7 days after the day it was mailed, as the case may be.

38. Correspondence to the Board shall be deemed to have been given to the Board on the day it was delivered, faxed, or e-mailed, or 7 days after the day it was mailed, as the case may be to the following address:

Yukon Water Board
Suite 106, 419 Range Road
Whitehorse YT Y1A 3V1

Fax#: (867) 456-3890
E-mail: ywb@yukonwaterboard.ca

39. The Board or the Licensee may, by notice in writing, change its address for delivery.

Spills and Unauthorized Discharges

40. Where a spill or an unauthorized discharge occurs that is of a reportable quantity under the Yukon *Spills Regulations,* the Licensee must immediately contact the 24-hour Yukon Spill Report number, (867) 667-7244 and implement the Spill Contingency Plan. A detailed written report on any such event including, but not limited to, dates, quantities, parameters, causes and other relevant details and explanations, must be submitted to the Board not later than 10 days after the occurrence.

41. The Licensee must apply the relevant procedures in the Spill Contingency Plan. The Licensee must review the Spill Contingency Plan annually and must provide a summary of that review, including any revisions to the plan, as a component of the annual report.

42. The Licensee must maintain a log book of all spills or unauthorized discharge occurrences, including spills that are less than the reportable quantities under the Yukon *Spills Regulations.* The log book must be made available at the request of an Inspector. The log book must include, but not necessarily be limited to the:
    a) date and time of the spill;
    b) substance spilt or discharged;
    c) approximate amount spilt or discharged;
    d) location of the spill;
    e) distance between the spill or discharge and the nearest Watercourse; and
    f) remedial measures taken to contain and clean-up the spill area or to cease the unauthorized discharge.

43. The Licensee must include a summary of all spills or unauthorized discharges that occur, as part of the monthly report, within 30 days of the spill occurrence.

44. The Licensee must ensure all relevant personnel are trained in procedures to be followed and the equipment to be used in the containment of a spill.

45. The Licensee must post the Spill Contingency Plan on site for the duration of the Project.

Fuel and Hazardous Materials Storage and Transfer

46. The Licensee must store and/or transfer fuel, lubricants, hydraulic fluids, coolants and similar substances a minimum of 30 metres from the Natural Boundary of any Watercourse, in such a way that said substances are not deposited in or allowed to be deposited in waters.

Monthly Reports

47. The Licensee must submit to the Board a copy of all monitoring data no more than 30 days after the conclusion of the month in which that data was collected. Monthly reports must include:
    a) The laboratory analytical results of all water quality monitoring done in accordance with Schedule A.
    b) Results of all water quantity and water level monitoring done in accordance with Schedule A.

Annual Reports

48. The Licensee must submit an annual report to the Board for the period of January 1 to December 31 of each year. Annual reports are to be submitted on or before March 31 of the year following the year reported. The annual report must include the information required by the Regulation as well as:
    a) a description of the water use operations carried out during the year reported;

b) the quantity of water withdrawn each day from the groundwater well;

c) the quantity, concentrations and duration of Waste discharged from the water treatment plant;

d) a description of any work carried out or planned to be carried out under the AMP as required by condition 18;

e) report on all trend analyses conducted for the purposes of adaptive management

f) a summary of any updates made to the adaptive management plan and the reason for the update;

g) results of all monitoring data as required by conditions 22 and 23 including analysis and interpretation by a qualified individual or firm and a discussion of any variances from baseline/background conditions or from previous years' data;

h) a detailed record of any major maintenance work carried out or planned to be carried out that could have an impact on water;

i) a summary of physical inspections and monitoring as required by condition 26;

j) a report on the findings of the twice-annual physical inspection of the Tailings Storage Facility as required by condition 27; and

k) a summary of any revisions to the Spill Contingency Plan as required by condition 41.

Deliverables

49. The Licensee shall provide to the Board, one unbound, single-sided, paper copy of all deliverables required by this Licence. All deliverables, with the exception of design drawings, must be reproducible by standard photocopier.

50. The Licensee must upload electronic copies of all deliverables required by this Licence to the Yukon Water Board's online licensing registry. Electronic copies must be submitted in one of the following formats: MS Word, MS Excel, or Adobe .pdf format. Water quality results must be in the format outlined in the *Laboratory Data Submission Standards for Water Quality*, as amended from time to time and available on the Board website.

SCHEDULE A

Table A1 – Surface Water Monitoring Locations

			NAD 83 Zone 8	
Station Category	**Monitoring Station**	**Description**	**Easting[a]**	**Northing[a]**
Compliance	WTP	Effluent from the WTP	tbd	tbd
Surface Water	PC-U	Pony Creek u/s of the Project, d/s of placer activity	388955	6881745
	PC-D	Pony Creek d/s of the Project	389131	6881719
	PC-DSP	Pony Creek d/s of the pit	388986	6881734
	DC-DX	Dome Creek u/s of mill area and road	387674	6881127
	DC-DX+105	Dome Creek at DX+105, u/s of mill area	387820	6881150
	DC-D1b	Dome Creek at D1b, d/s of mill area	388264	6880989
	DC-B	Dome Creek diversion channel at bridge u/s of TSF	389439	6880781
	DC-DSS	Dome Creek d/s of WTP discharge, u/s of Dome Creek diversion	389719	6880569
	DC-U	Dome Creek downstream of TSF, seepage pond and WTP	389788	6880565
	DC-R	Dome Creek at Mt. Nansen Road	391111	6880449
	DC-UVC	Dome Creek u/s of confluence of Victoria Creek	391792	6880327
	DC-M	Dome Creek at mouth, u/s of confluence with Victoria Creek		
	PIT-1,2,3	Open pit at specified depths		
	TP	Tailings Pond	389427	6880625
	BC-U	Back Creek u/s of Pony Creek and u/s of the Project within area of placer disturbance		
	BC-D	Back Creek u/s of confluence with Victoria Creek	391626	6880901
	VC-U	Victoria Creek u/s of Back Creek and u/s of the Project	391626	6880872
	VC-DBC	Victoria Creek d/s of Back Creek, u/s of Dome Creek	391633	6880740
	VC-UMN	Victoria Creek u/s of Minnesota Creek d/s of Dome Creek	392413	6879244
	VC-R	Victoria Creek at Mt. Nansen Road	392431	6878802
	VC-R + 150	Victoria Creek at Mt. Nansen Road – winter location	392305	6878755
	VC-R + 290	Victoria Creek at road + 290	392295	6878638
	MN	Minnesota Creek u/s of Victoria Creek		
Seeps	ADIT-SEEP	Pony Creek adit seep	389081	6881709
	SEEP	Seepage collection pond	389604	6880598
	SEEPd	Discharge from Seepage collection pond	389604	6880598
	MS-S-03	Mill Site Seep 03	387884	6881121
	MS-S-08	Mill Site Seep 08	387954	6881073
	DESS-01	Dome East Slope Seep 01	388632	6881131
	DESS-02	Dome East Slope Seep 02	388699	6881087
	DESS-03	Dome East Slope Seep 03	388518	6881143
	DESS-04	Dome East Slope Seep 04		
	CH-P-13-01	Upwelling near CH-P-13-01	388640	6881165
	LW-SEEP-01	Lower West Toe of Waste Rock Pile Seep	388711	6881371
	NW-SEEP-02	East Toe of Northwest Pile Seep	388837	6881617

Table A2 – Groundwater Monitoring Locations

		NAD 83 Zone 8	
Site Area	**Well ID**	**Easting[a]**	**Northing[a]**
Dome Creek	GSI-DC-01B	387675	6881124
	GSI-DC-02B	387879	6881129
	GSI-DC-03B	388107	6881079
	GSI-DC-05B	388725	6880836
	GSI-DC-06B	389788	6880567
	GSI-DC-07B	390065	6880641
	GSI-DC-08B	390311	6880583
	GSI-DC-09B	390614	6880494
	GSI-DC-10B	390859	6880447
Mill Complex	GSI-HA-01A	387842	6881132
	GSI-HA-02A	387861	6881135
	GSI-HA-03A	387878	6881131
	GSI-HA-04A	387916	6881130
	GSI-HA-05A	387898	6881125
	MW09-16	387992	6881094
	MW09-17	388075	6880970
	MW09-18	388054	6880986
	MW09-19	388051	6881016
Brown McDade Pit	CH-P-13-01/10	388657	6881116
	CH-P-13-03/50	389143	6881110
	CH-P-13-04/10	389138	6881472
	CH-P-13-04/35	389138	6881472
	CH-P-13-05/50	388954	6881466
	GLL07-01	388851	6881783
	GLL07-02	389069	6881703
	GLL07-03	388959	6881477
	MW09-13	389006	6881664
	MW09-14	389008	6881669
	MW09-15	388920	6881727
Pony Creek	GSI-PC-02B	388907	6881786
	GSI-PC-03B	389256	6881706
	GSI-PC-04B	389586	6881656
	GSI-PC-05B	389713	6881661
	MP09-02	388867	6881816
	MP09-03	388956	6881739
	MP09-08	389160	6881718
Seepage Dam	W14103083BH0	389522	6880669
	W14103083BH02	389561	6880665
	W14103083BH04	389544	6880666
Tailings Facility	MP09-04	389575	6880609
	MP09-05	389548	6880590

		NAD 83 Zone 8	
Site Area	**Well ID**	**Easting[a]**	**Northing[a]**
Tailings Facility	MP09-09	389240	6880681
	MP09-10	389241	6880684
	MP09-11	389220	6880619
	MP09-12	389220	6880619
	MP09-14	389138	6880722
	MW09-02	389393	6880562
	MW09-03	389411	6880555
	MW09-04	389420	6880557
	MW09-05	389413	6880656
	MW09-06	389411	6880653
	MW09-071	389322	6880699
	MW09-08	389620	6880576
	MW09-11	389037	6880711
	MW09-20	389592	6880586
	MW09-21	389536	6880577
	MW09-22	389495	6880549
	MW09-23	389459	6880553
	MW09-24	389561	6880624
	W14103083BH03	389132	6880730
Pumphouse Well	PW (Pumphouse Well near Victoria Creek)	391558	6880856

Table A3 – Monitoring Frequency and Monitoring Requirements

Station Category	Station ID	Monitoring	
		Frequency	**Requirement**
Compliance	WTP	W	ES
		BiM	LC50
		C	FS, Q, Turbidity
Surface Water	PC-U	M	FS, ES
		A	SED
	PC-D	M	FS, ES,
		A	SED
	PC-DSP	M	Qd
	DC-DX	M	FS, ES
	DC-DX+105	M	FS, ES, Q
	DC-D1b	M	FS, ES, Q
		A	SED, BEN, PERI, CHLa
	DC-B	M	FS, ES
		C	Q
	DC-DSS	M	FS, ES
	DC-U	M	FS, ES, Q
		A	SED, BEN, PERI, CHLa

Station Category	Station ID	Monitoring	
		Frequency	Requirement
Surface Water	DC-R	M	FS, ES, Q
		A	SED, BEN, PERI, CHLa
	DC-UVC	M	FS, ES
		C	Q
	DC-M	A	SED, BEN, PERI, CHLa
	PIT-1,2,3	M	FS, ES, Q (water level)
	TP	M	FS, ES, Q
		D	Water level
	BC-U	M	FS, ES
		A	SED
	BC-D/BC	M	FS, ES
		C	Q
		A	SED
	VC-U	M	FS, ES
		C	Q
		A	SED, BEN, PERI, CHLa
	VC-DBC	M	FS, ES
		C	Q
		A	SED, BEN, PERI, CHLa
	VC-UMN	M	FS, ES
		C	Q
		A	SED, BEN, PERI, CHLa
	VC-R	M	FS, ES
		A	SED, BEN, PERI, CHLa
	VC-R + 150[1]	M	FS, ES
	VC-R + 290	C	Q
	MN	M	FS, ES
		A	SED
Seeps	ADIT-SEEP	M	Vi
		3xY	FS, ES
	SEEP	M	FS, ES, Q
		D	Q (water level)
	SEEPd	W	FS, ES, Q, duration of discharge
	MS-S-03	M	Vi
		3xY	FS, ES
	MS-S-08	M	Vi
		3xY	FS, ES
	DESS-01	4xY	FS, ES
	DESS-02	4xY	FS, ES
	DESS-03	4xY	FS, ES
	DESS-04	4xY	FS, ES
	CH-P-13-01	4xY	FS, ES
	LW-SEEP-01	4xY	FS, ES
	NW-SEEP-02	4xY	FS, ES

Station Category	Station ID	Monitoring	
		Frequency	Requirement
Groundwater	GSI-DC-01B	3xYg	FSg, ESg
	GSI-DC-02B	3xYg	FSg, ESg
	GSI-DC-03B	3xYg	FSg, ESg
	GSI-DC-05B	3xYg	FSg, ESg
	GSI-DC-06B	3xYg	FSg, ESg
	GSI-DC-07B	3xYg	FSg, ESg
	GSI-DC-08B	3xYg	FSg, ESg
	GSI-DC-09B	3xYg	FSg, ESg
	GSI-DC-10B	3xYg	FSg, ESg
	GSI-HA-01A	3xYg	FSg, ESg
	GSI-HA-02A	3xYg	FSg, ESg
	GSI-HA-03A	3xYg	FSg, ESg
	GSI-HA-04A	3xYg	FSg, ESg
	GSI-HA-05A	3xYg	FSg, ESg
	MW09-16	3xYg	FSg, ESg
	MW09-17	3xYg	FSg, ESg
	MW09-18	3xYg	FSg, ESg
	MW09-19	3xYg	FSg, ESg
	CH-P-13-01/10	3xYg	FSg, ESg
	CH-P-13-03/50	3xYg	FSg, ESg
	CH-P-13-04/10	3xYg	FSg, ESg
	CH-P-13-04/35	3xYg	FSg, ESg
	CH-P-13-05/50	3xYg	FSg, ESg
	GLL07-01	3xYg	FSg, ESg
	GLL07-02	3xYg	FSg, ESg
	GLL07-03	3xYg	FSg, ESg
	MW09-13	3xYg	FSg, ESg
	MW09-14	3xYg	FSg, ESg
	MW09-15	3xYg	FSg, ESg
	GSI-PC-02B	3xYg	FSg, ESg
	GSI-PC-03B	3xYg	FSg, ESg
	GSI-PC-04B	3xYg	FSg, ESg
	GSI-PC-05B	3xYg	FSg, ESg
	MP09-02	3xYg	FSg, ESg
	MP09-03	3xYg	FSg, ESg
	MP09-08	3xYg	FSg, ESg
	W14103083BH0	3xYg	FSg, ESg
	W14103083BH02	3xYg	FSg, ESg
	W14103083BH04	3xYg	FSg, ESg
	MP09-04	3xYg	FSg, ESg
	MP09-05	3xYg	FSg, ESg
	MP09-09	3xYg	FSg, ESg
	MP09-10	3xYg	FSg, ESg
	MP09-11	3xYg	FSg, ESg
	MP09-12	3xYg	FSg, ESg

Station Category	Station ID	Monitoring	
		Frequency	Requirement
Groundwater	MP09-14	3xYg	FSg, ESg
	MW09-02	3xYg	FSg, ESg
	MW09-03	3xYg	FSg, ESg
	MW09-04	3xYg	FSg, ESg
	MW09-05	3xYg	FSg, ESg
	MW09-06	3xYg	FSg, ESg
	MW09-071	3xYg	FSg, ESg
	MW09-08	3xYg	FSg, ESg
	MW09-11	3xYg	FSg, ESg
	MW09-20	3xYg	FSg, ESg
	MW09-21	3xYg	FSg, ESg
	MW09-22	3xYg	FSg, ESg
	MW09-23	3xYg	FSg, ESg
	MW09-24	3xYg	FSg, ESg
	W14103083BH03	3xYg	FSg, ESg
	PW	D	V

1. Alternate winter location to VC-R

Legend

Symbol	Monitoring Frequency
W	Weekly when discharging
BiM	Bi-monthly (every two months)
M	Monthly
C	Continuous
D	Daily
A	Annually in August to mid-September
3xY	Three sampling events per year
3xYg	Sample once in June, once in September and once between Jan 15 and Feb 15
4xY	Sample once during freshet, once in summer, once in fall and once prior to freeze-up
Symbol	**Monitoring Requirement**
FS	Field Measurements: pH, specific conductance, temperature
ES	External Laboratory Suite: **Physical**: pH, specific conductance, TSS, TDS, hardness as $CaCO_3$ **Cyanide**: CNO, SCN, SAD-CN, WAD-CN, free cyanide **Alkalinity**: Total alkalinity, bicarbonate, carbonate, hydroxide **Anions/Nutrients:** Total NH3-N, NO3-N, NO2-N, Cl, F, SO4 **Carbon:** TOC, DOC **Metals:** Total and Dissolved metals ICP scan (as described in Table 4.4-3 of exhibit 1.2)
LC50	96-hour LC50 rainbow trout acute lethality test in accordance with Reference Method EPS 1/RM/13 or EPS 1/RM/50.
Q	Discharge measurements (streamflow/effluent flow) or water level (ponds, pit)
Vi	Visual inspection
FSg	Field Measurements: pH, specific conductance, temperture, ORP, DO, turbidity (NTU), sulphide, depth to water, depth to bottom, well stick-up height
ESg	External Laboratory Suite: **Physical:** pH, specific conductance, TDS, hardness as $CaCO_3$ **Cyanide:** SCN, SAD-CN, WAD-CN, free cyanide **Alkalinity:** Total alkalinity, bicarbonate, carbonate, hydroxide **Anions/Nutrients:** Total NH3-N, NO3-N, NO2-N, Cl, F, SO4-D, **Carbon:** TOC, DOC, TIC **Metals:** Dissolved metals ICP scan including Hg
SED	Sediment sampling
BEN, PERI, CHLa	Benthic Invertebrates, periphyton and chlorophyll *a*

Photo 1. VC-BG

Newly sampled location at upstream most accessible Victoria Creek reach. Ice and snow cover over channel upstream of sampling location. Looking upstream.

Photo 2. VC-REF

Existing but non-regularly sampled location on Victoria Creek approximately 500 m upstream of VC-U. Looking upstream.

Photo 3. VC-U

Regularly sampled upstream-most Victoria Creek location. Looking toward left bank.

Photo 4. VC-R

Downstream-most regular sampling location on Victoria Creek, upstream of culvert. Looking upstream.

Photo 5. DC-DX

Upstream-most Dome Creek regular sampling location. Looking upstream.

Photo 6. DC-15

Dome Creek location adjacent to MS-S-03. Looking upstream.

Photo 7. DC-B

Dome Creek regular sampling location at bridge crossing to tailings pond. Looking downstream.

Photo 8.DC-U

Dome Creek regular sampling location downstream of confluence with seep pond discharge flow. Looking downstream.

Photo 9. DC-R

Dome Creek regular sampling location at road culvert crossing. Looking upstream.

Photo 10. DC-UVC

Dome Creek regular sampling location upstream of confluence with Victoria Creek. Looking downstream.

Photo 11. BC

Back Creek regular sampling location. Looking toward right bank.

Photo 12. PC-D

Pony Creek downstream regular sampling location. Looking upstream.

Photo 13. MN

Minnesota Creek location upstream of confluence with Victoria Creek. Looking upstream.

Photo 14. Brown-McDade pit overview

Photo 15. MS-Back

Mill seep at north end of mill structure.

Photo 16. MS-P

Seep downgradient from mill, adjacent to small holding pond (left of frame).

Photo 17. MS-Road

Seep east of mill structure, adjacent to road.

Photo 18. MS-S-03

Regularly sampled location north of mill structure adjacent to road.