

From: [Jessica Pacunayen](#)
To: [Roberta Judas](#)
Subject: FW: Characterization Plans for the Community of Wekweèti and Gamèti
Date: December 4, 2020 1:56:58 PM
Attachments: [RE Gameti backwash and wastewater tank sample results.msg](#)
[RE Community Government of Wekweeti - WSF - OM Plan - Version 3.0 - Board Decision \(W2017L3-0001\).msg](#)

From: Jessica Pacunayen
Sent: November 30, 2020 11:59 AM
To: Foster, Arlen <Arlen.Foster@stantec.com>
Cc: Anneli Jokela <ajokela@wlb.ca>; sao@gameti.org; financewekweti@northwestel.net;
Heather_Beck@gov.nt.ca; David-Scott_McQuinn@gov.nt.ca
Subject: Characterization Plans for the Community of Wekweèti and Gamèti

Hi Arlen,

Thanks for the Characterization and Testing Plan (CTP) submissions. It doesn't appear that either submission for the Characterization and Testing Plans satisfies the Board's previous direction. As a reminder, please see the following requirements for each of the WSF CTPs:

Wekweèti WSF CTP (August 19 RFD)

- a. A summary of each Waste produced;
- b. The results from two Waste Characterization sampling events to determine the composition of each Waste (i.e., backwash, wastewater, and CIP Waste), presented in a tabulated summary that would facilitate comparison and interpretation;
- c. The description of sampling (for characterization or otherwise) for each Waste type should include:
 - i. Parameters sampled;
 - ii. Any criteria Waste results are compared to;
 - iii. Sample location, including the change from sampling CIP Waste from Wastewater Tank to the SUEZ membrane tank drain;
 - iv. Number of samples taken;
 - v. Frequency and timing of sampling;
 - vi. Final disposal location;
- d. A summary of findings from the Dalhousie research study; and
- e. An implementation plan to respond to any recommendations made by the study, including any recommendations for the Licence and the WSF CTP.

Gamèti WSF CTP (August 19 RFD)

- a. Clarify that the sampling location for CIP Waste will be at the SUEZ membrane tank drain, prior to CIP Waste entering the Wastewater Tank;
- b. Include characterization results for the CIP Waste;
- c. Include the results from two Waste characterization sampling events to determine the composition of all these Waste types (i.e., backwash, wastewater, and CIP Waste). These results should be presented in a tabulated summary that would facilitate comparison and interpretation;

- d. Include a summary of findings from the Dalhousie research study; and
- e. An implementation plan to respond to any recommendations made by the study, including any recommendations for the Licence and/or the WSF CTP.

Please re-submit the CTPs with the required revisions above. If the Community Governments and/or the consultants are proposing deviation(s) from the Board's direction, then rationale for each deviation from the Board direction should be included in the cover letter. Please also ensure that any changes to the plans are included in the revision history table as per the Boards' [Document Submission Standards](#).

Board staff believe a call to discuss the contents of the CTPs would be beneficial. Please let us know when you and any other relevant parties would be available for one.

Masi,

Jessica Pacunayen, M.Sc. (she/her/hers)

Regulatory Specialist

Wek'èezhìi Land and Water Board

#1-4905 48th St. | Yellowknife, NT | X1A 3S3

ph 867.765.4591 | fax 867.765.4593

jpacunayen@wlwb.ca | www.wlwb.ca



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From: [Foster, Arlen](#)
To: [Anneli Jokela](#)
Cc: [Troy Bourque](#); [Jainish Patel \(jainishp@awcsolutions.com\)](#); [Justin Hazenberg](#); [sao@gameti.org](#); [Ryan Fequet](#); [Jessica Pacunayen](#)
Subject: RE: Gameti backwash and wastewater tank sample results
Date: November 9, 2020 2:56:40 PM
Attachments: [image001.gif](#)
[image002.jpg](#)
[144902412_mem_wlwb_gameti_20201109.pdf](#)

Hi Anneli & Jessica,

Please see attached the submission for the Waste Characterization and Sampling Plan for Gameti. Please let me know after review if there are any questions, comments or concerns with this submission and any remaining items for the WTP.

Regards,

Arlen Foster P. Eng.
Senior Associate, Civil Team Lead, Northern Canada

Direct: 867 920-2882 ext 249
Mobile: 867 446-0568
arlen.foster@stantec.com

Stantec
2nd Floor 4910 53 Street, PO Box 1777
Yellowknife NT X1A 2P4



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From: Anneli Jokela <ajokela@wlwb.ca>
Sent: Friday, March 20, 2020 2:57 PM
To: Justin Hazenberg <Justin_Hazenberg@gov.nt.ca>
Cc: Troy Bourque <Troy_Bourque@gov.nt.ca>; Jainish Patel (jainishp@awcsolutions.com) <jainishp@awcsolutions.com>; sao@gameti.org; Altaf Durrani <Altaf_Durrani@gov.nt.ca>; Iqbal Arshad <Iqbal_Arshad@gov.nt.ca>; Foster, Arlen <Arlen.Foster@stantec.com>; grace_lau-a@gov.nt.ca; Olivia_Lee@gov.nt.ca; Alison_Brown@gov.nt.ca; Ryan_Fequet@wlwb.ca; Jessica_Pacunayen@wlwb.ca
Subject: RE: Gameti backwash and wastewater tank sample results

Hello,

Thank you for submitting an update on the testing that has been taking place at the Water Supply Facilities (WSF) in Gameti. It is unclear, however, if this information is being provided as an update or as a submission intended to address the Board's direction regarding the requirement for a Water Supply Facilities Characterization and Testing Plan (which was expected on October 31, 2019). It is also unclear whether the correction to the draft O&M plan attached is meant as the proposed update to the WSF O&M Plan that was required by the Board (which was expected once the

commissioning of the WSF was complete).

On August 19, 2019, the Board [issued an Amendment Water Licence](#) for the Community Government, that allowed for the discharge of waste from the new WSF. The amended Water Licence included new and revised conditions intended to address the uncertainty related to the chemical composition of the discharge streams (i.e., backwash and wastewater). Specifically, the Board included Condition D: ***“The Licensee shall submit a Water Supply Facilities Characterization and Testing Plan to the Board for approval.”*** As outlined in the Reasons for Decision (RFD):

The Water Supply Facilities Characterization and Testing Plan should include details on the following:

- The study to determine the composition of the backwash and wastewater;
- The results of the study to determine the composition of the backwash and wastewater; and,
- The proposed testing plan requirements moving forward, including but not limited to, a list of the parameters to be tested, the frequency of testing, and the method of reporting. “

It was noted in the RFD that “The CGG’s responses during the public review indicate that a sampling program is already underway, which could be used to inform the WSF Characterization and Testing Plan. In development of the Plan, the CGW should engage with ENR to ensure that the clarity requested by ENR is being addressed.” In a letter received on [September 17, 2019](#), it was stated that “a detailed Water Supply Facilities Characterization and Testing Plan will be submitted to the Board for review and approval currently scheduled for October 31, 2019.”

It appears that the CGG has been proceeding with additional testing, however, no plan has been submitted to the Board. The required Plan is intended to outline the testing that is to be done, which would provide guidance for the community and the Inspector. Board staff understand that there are concerns about testing requirements being onerous for the community. As discussed in previous conversations with MACA staff, the proposed plan can take that into consideration and propose short- and long-term testing plans that are commensurate with the potential composition of the discharge streams and the community’s testing capacity.

Board staff would also like to stress that this plan was expected to help inform the impending proceeding to amend the Community Government of Wekweètì’s Water Licence to allow for the operation of a new WSF that is planned for this coming summer.

Board staff are requesting that the required **Water Supply Facilities Characterization and Testing Plan** be submitted as soon as possible. If the information provided in the email was intended to address this, please resubmit in a package that includes a cover letter outlining how the information addresses the Board’s direction.

In addition, if the attached correction to the O&M plan was intended to be an update to the existing plan, please resubmit this as an updated version and follow the [Boards’ Document Submission Standards](#). As [previously communicated](#), Version 3.1 of the WSF O&M Plan was to include a number of revisions to address the Board’s Reasons for Decision for the Water Licence Amendment. Board

staff suggest that it would be most efficient for all Parties if these revisions were all addressed in a single and comprehensive updated submission.

Masi,

Anneli Jokela, PhD

Regulatory Manager

Wek'èezhii Land and Water Board

#1-4905 48th St. | Yellowknife, NT | X1A 3S3

ph 867.765.4588 | fax 867.765.4593

☐ ajokela@wlwb.ca | www.wlwb.ca

WLWB



All correspondence to the Board, including emails, letters, faxes and attachments are public documents and may be posted to the public registry.

From: Justin Hazenberg <Justin_Hazenberg@gov.nt.ca>

Sent: March 2, 2020 9:51 AM

To: Anneli Jokela <ajokela@wlwb.ca>

Cc: Troy Bourque <Troy_Bourque@gov.nt.ca>; Jainish Patel (jainishp@awcsolutions.com) <jainishp@awcsolutions.com>; sao@gameti.org; Altaf Durrani <Altaf_Durrani@gov.nt.ca>; Iqbal Arshad <Iqbal_Arshad@gov.nt.ca>

Subject: Gameti backwash and wastewater tank sample results

Anneli,

On behalf of AWC and the Community of Gameti, please accept the following sampling results from sewage holding tank (waste water) and backwash stream at the Gameti WTP. Treated and raw water results are also included for reference. An additional round of laboratory sampling will be completed from the sewage (waste water) tank during first the clean-in-place procedure scheduled for later this month. Long term sampling on the CIP water prior to be put into the sewage holding tank (waste water) will be completed on-site for chlorine and pH as per the O&M Manual.

Also attached is a correction to the draft O&M Manual from AWC on analyser and CIP waste.

Please don't hesitate to call me if you have any questions.

Mársi | Kinanaskomitin | Thank you | Merci | Hǵı' | Quana | Qujannamiik | Quyanainni | Máhsı | Máhsı | Mahsi
Justin Hazenberg, P.Eng.

Engineering Team Lead, Water and Sanitation

Community Operations
Department of Municipal and Community Affairs
Government of the Northwest Territories

5th floor, Northwest Building
PO Box 1320
#500, 5201 – 50th Avenue
Yellowknife, NT X1A 3S9

Phone: 867-767-9164 Ext. 21078

Fax: 867-873-0584

www.gov.nt.ca

| | | | |
|-------|---|-------|----------------------------------|
| To: | Anneli Jokela, PhD Wek'èezhii Land and Water Board | From: | Arlen Foster, P. Eng. Stantec |
| File: | 144902412 08-16 | Date: | November 9, 2020 |

Reference: 144902412 Gamèti Water Treatment Plant – W2018L3-0001 – Water Supply Facilities Characterization and Testing Plan

As per the request from the Wek'èezhii Land and Water Board, on behalf of the Community Government of Gamèti and the Government of the Northwest Territories in association with AWC Water Solutions, we provide the following Water Characterization and Sampling Plan for record.

This includes water quality results for the raw water, treated water, backwash discharge, wastewater tank samplings carried out during the WTP's commissioning in October 2019. It also includes the CIP wastewater sampling results conducted recently in October 2020, one year after normal plant operation.

We look forward to any remaining discussion that may be necessary from the WLWB.

Respectfully,

Stantec Architecture Ltd.



Arlen Foster P. Eng.
Senior Associate

Phone: (867) 920-2882

Email: arlen.foster@stantec.com

Attachment: Gameti WTP Waste Characterization and Sampling Plan



GAMETI WTP

Water Supply Facilities Characterization and Testing Plan

10338-PR-RPT-002

Project No: 10338

Ultra-Filtration Potable Water Plant

| | | | | | |
|------------|-------------|---|-------------------|----------------|-----------------|
| | | | | | |
| | | | | | |
| | | | | | |
| | | | | | |
| 0 | 27/10/2020 | ISSUED FOR INFORMATION (with CIP results) | SB | | |
| Rev | Date | Rev Description | Originator | Checker | Approver |



Document Number: 10338-PR-RPT-002

Document Rev: 0

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1. WATER CHARACTERIZATION SAMPLING PLAN

The Gameti Water Treatment Plant (WTP) is a turnkey membrane ultrafiltration system, with sodium hypochlorite (chlorine) disinfection, installed within a skid-mounted building. The raw water source for the new WTP is Rae Lake (1.5 km east of the community).

1.1. Water quality sampling

Gameti drinking WTP was commissioned in the month of October, 2019. After successful plant start-up and commissioning, water samples were collected for laboratory testing from all points in the WTP where liquid was either entering or being discharged. This enabled all interfaces with the surrounding infrastructure and environment. Testing was carried out which included routine water analysis, organics, metals, and bacterial coliform tests (refer to Table 1 all the interfaces). It is to be noted that clean-in-place (CIP) wastewater was generated only when a CIP is conducted, which occurred when the WTP had been in full operation for a few months. CIP wastewater sampling was conducted 19th and 20th September, 2020 with performance of the first CIP. The CIP involves citric acid and sodium hypochlorite cleaning of membranes by soaking them overnight in respective chemical solutions. The chemicals are neutralised before being drained to the waste tank. As citric acid is organic, the residual waste composition does not exceed any of the discharge guidelines parameter.

Table 1: Gameti WTP Commissioning Test Plan.

| Interface | Sample Location | Commissioning Test (CT) Frequency | Parameters |
|------------------------|--------------------------|--|------------|
| Raw Water | Inlet Sample HV-025 | 1 x CT | Full set |
| Backwash Water | Overland discharge pipe | 1 x CT | Full set |
| Wastewater Discharge | Wastewater Tank – HV-133 | 1 x CT | Full set |
| Treated water | Truck fill line SV-071 | 1 x CT | Full set |
| Membrane Startup Water | Permeate Sample SV-209 | 1 x CT | Full set |
| CIP water | Overland discharge pipe | 2 x CIP (Citric acid and sodium hypo) | Full set |



1.2. Water quality test results

The table below (Table 2) highlights some results from testing for raw water, backwash water, and the wastewater tank of the samples collected during commissioning of Gameti WTP. CIP sampling was conducted after a year of normal plant operation for membranes cleaning. Separate citric acid and sodium hypochlorite CIP sampling result highlights are listed in the Table 3 below. Raw water is shown for a background reference. Backwash water which is discharged overland, is compared to the current municipal water licence lagoon discharge criteria at SNP 003-2 and SNP 003-3. It is to be noted that during overland discharge, there is no risk of surface erosion as the water is discharged 20 ft away from the WTP. The surface is stable with extensive tree and shrubs holding the soil. The discharge point is monitored for any potential erosion. The site was inspected by AWC technician during the last visit (Sept., 2020 along with performing CIP), and there were no signs of erosion. Further, the discharge point is more than 200 ft away from the lake shore, eliminating any residual wash into the source water. Water quality from the wastewater tank, which is pumped out and hauled to municipal sewage lagoon for treatment, is compared to Schedule I: Standards for Process Effluent Discharged to Municipal Sewage Systems in the Government of the Northwest Territories Department of Environment and Natural Resources 2004 Guideline for Industrial Waste Discharges in the NWT.

Samples were rushed to Yellowknife, NT (within 24 hours) and tested at ALS Laboratory. Treated water was checked for pathogens (i.e., E. coli and total coliforms) in 24 hours and 48 hours duration of WTP operation. Separately, GNWT also conducted treated water sampling for E. coli and total coliform which were tested in Stanton Territorial Hospital Laboratory in Yellowknife. The complete lab reports are included in the appendices.



Table 2: Gameti WTP Commissioning Test Plan.

| Raw Water (Inlet Sample HV-025) | | | |
|--|--------------|---------------------|--|
| Parameters | Units | Test Results | |
| Color | TCU | <5.0 | |
| Iron (total) | mg/L | <0.010 | |
| Manganese (total) | mg/L | 0.002 | |
| pH | - | 8.18 | |
| Total Dissolved Solids | mg/L | 215 | |
| Total Organic Carbon | mg/L | 5.07 | |
| Hardness (as CaCO ₃) | mg/L | 153 | |
| Turbidity | NTU | 0.33 | |
| Backwash Water (Overland discharge pipe) | | | |
| Parameters | Units | Test Results | SNP 003-2/3 |
| Total Suspended Solids | mg/L | 46.9 | 240/25 |
| Oil and Grease | mg/L | <5.0 | 5/5 |
| CBOD | mg/L | 4 (BOD) | 235/25 |
| Faecal Coliforms | CFU/100 mL | n/a | 1 x10 ⁶ /1 x10 ⁶ |
| pH | - | 8.81 | 6 - 9 |
| Wastewater Discharge (Wastewater Tank – HV-133) | | | |
| Parameters | Units | Test Results | Industrial Waste Discharge Guidelines |
| Aluminum | mg/L | 0.0933 | 50 |
| Arsenic | mg/L | 0.00034 | 1 |
| Barium | mg/L | 0.0237 | 5 |



| | | | |
|---------------------------|--------|-------------|------------|
| Biochemical oxygen demand | mg/L | <2.0 | 500 |
| Cadmium | mg/L | 0.0000262 | 2 |
| Chlorides | mg/L | 72.9 | 1500 |
| Chromium | mg/L | 0.00576 | 5 |
| Copper | mg/L | 0.0299 | 5 |
| Cyanide | mg/L | <0.0050 | 2 |
| Fluoride | mg/L | <0.10 | 10 |
| Lead | mg/L | 0.000637 | 5 |
| Iron | mg/L | 0.144 | 50 |
| Mercury | mg/L | <0.0000050 | 0.1 |
| Nickel | mg/L | 0.00303 | 5 |
| Oil & Grease | mg/L | <5.0 | 150 |
| pH | - | 8.09 | 6.5 - 10.5 |
| Phenolic compounds | mg/L | <0.0010 | 1 |
| Phosphorus | mg/L | 0.612 | 100 |
| Silver | mg/L | 0.000033 | 5 |
| Sulphates | mg/L | 50.9 | 1500 |
| Sulphides | mg/l | not sampled | 2 |
| Suspended solids | mg/l | <3.0 | 600 |
| Tin | - mg/L | 0.00077 | 5 |
| Zinc | - mg/L | 0.0456 | 5 |
| Color | - TCU | <5.0 | 15 |



Table 2: Gameti WTP CIP Wastewater Sampling Result.

| Citric Acid CIP Wastewater Discharge (Overland Discharge Pipe) | | | |
|--|--------|--------------|---------------------------------------|
| Parameters | Units | Test Results | Industrial Waste Discharge Guidelines |
| Aluminum | mg/L | 0.0259 | 50 |
| Arsenic | mg/L | 0.0030 | 1 |
| Barium | mg/L | 0.0436 | 5 |
| Biochemical oxygen demand | mg/L | <2.0 | 500 |
| Cadmium | mg/L | 0.0000441 | 2 |
| Chlorides | mg/L | 6.05 | 1500 |
| Chromium | mg/L | 0.00024 | 5 |
| Copper | mg/L | 0.0060 | 5 |
| Fluoride | mg/L | 0.059 | 10 |
| Lead | mg/L | 0.000217 | 5 |
| Iron | mg/L | 0.037 | 50 |
| Mercury | mg/L | <0.0000050 | 0.1 |
| Nickel | mg/L | 0.00143 | 5 |
| pH | - | 8.17 | 6.5 - 10.5 |
| Phosphorus | mg/L | <0.050 | 100 |
| Silver | mg/L | 0.000010 | 5 |
| Suspended solids | mg/l | <3.0 | 600 |
| Tin | - mg/L | 0.00072 | 5 |
| Zinc | - mg/L | 0.0196 | 5 |

**Sodium Hypochlorite CIP Wastewater Discharge (Overland Discharge)**

| Parameters | Units | Test Results | Industrial Waste Discharge Guidelines |
|---------------------------|--------|--------------|---------------------------------------|
| Aluminum | mg/L | 0.0875 | 50 |
| Arsenic | mg/L | 0.00030 | 1 |
| Barium | mg/L | 0.0436 | 5 |
| Biochemical oxygen demand | mg/L | <2.0 | 500 |
| Cadmium | mg/L | 0.0000441 | 2 |
| Chlorides | mg/L | 6.05 | 1500 |
| Chromium | mg/L | 0.00024 | 5 |
| Copper | mg/L | 0.00620 | 5 |
| Fluoride | mg/L | 0.059 | 10 |
| Lead | mg/L | 0.00217 | 5 |
| Iron | mg/L | 0.037 | 50 |
| Mercury | mg/L | <0.0000050 | 0.1 |
| Nickel | mg/L | 0.00142 | 5 |
| pH | - | 8.26 | 6.5 - 10.5 |
| Phosphorus | mg/L | <0.050 | 100 |
| Silver | mg/L | 0.000010 | 5 |
| Suspended solids | mg/l | <3.0 | 600 |
| Tin | - mg/L | 0.00072 | 5 |
| Zinc | - mg/L | 0.0196 | 5 |



2. Long Term Water Quality Test Plan

Current sampling programs at the Gameti WTP include:

- continuous online measurements of turbidity in the raw water, filtered water, and treated water storage;
- continuous online measurements of free chlorine in CT tank and treated water tank;
- thrice daily in-plant grab testing of the treated water for chlorine and turbidity
- weekly bacteriological sampling for total coliforms and e.coli;
- annual chemical analysis of both the raw and treated water of the 29 parameters identified in the Water Supply Regulations;

The above sample results are reviewed by the local operator and the Regional Environmental Health Officer to ensure the Community of Gameti continues to receive high-quality, safe drinking water. They provide meaningful results in which an operator can immediate action to protect the quality of water, i.e. increase chlorine does or perform a membrane repair.

Operators also perform in-plant testing of the post CIP water for chlorine and pH to ensure water has been fully de-chlorinated and are of a neutral pH before allowing it to pass through overland discharge.

Grab samples of the backwash water and wastewater tank water taken during commissioning are provided for reference. Membrane CIP was carried out after almost a year of the WTP being operational. CIP waste was sampled as a recommendation by ENR and MVLWB. These parameters are not expected to experience significant fluctuation in their concentration, whereby it exceeds the guideline limit or its comparison data. No chemical addition, other than post-filter chlorination, is completed in this process. Filtered water used in the backwash is not chlorinated. Additional long term sampling of the backwash water, CIP wastewater and the wastewater tank would not provide any information to the operator in which they can take corrective measures. Therefore, an onerous long-term sampling program on backwash water and wastewater tank would not provide information of practical value to the operations and is not recommended.

Also, the research team at Dalhousie University have been engaged by MACA, ENR and MVLWB to study impacts of WTP residuals and waste to the environment across NWT. The initial report is expected by end of the summer, 2020. The study will be outlining recommendations on best practices and whether there would be value in additional long-term sampling.



Document Number: 10338-PR-RPT-002

Document Rev: 0

APPENDICES



AWC SOLUTIONS
 9087A 198 Street,
 Langley BC V1M 3B1
 ATTN: Jainish Patel

Date: 31-OCT-19
PO No.:
WO No.: L2368827
Project Ref: 10338G
Sample ID: WASTE WATER
Sampled By:
Date Collected: 21-OCT-19
Lab Sample ID: L2368827-1
Matrix: WATER

| Test Description | Result | Qualifier | Units of Measure | CDWQG MAC | Aesthetic Objective | Date Analyzed |
|---|------------|-----------|------------------|-----------|---------------------|---------------|
| Alkalinity Species by Titration | | | | | | |
| Alkalinity Species by Titration | | | | | | |
| Alkalinity, Bicarbonate (as CaCO3) | 136 | | mg/L | | | 24-OCT-19 |
| Alkalinity, Carbonate (as CaCO3) | <1.0 | | mg/L | | | 24-OCT-19 |
| Alkalinity, Hydroxide (as CaCO3) | <1.0 | | mg/L | | | 24-OCT-19 |
| Alkalinity, Total (as CaCO3) | 136 | | mg/L | | | 24-OCT-19 |
| Anions by Ion Chromatography | | | | | | |
| Sulfate in Water by IC | | | | | | |
| Sulfate (SO4) | 50.9 | | mg/L | | 500 | 24-OCT-19 |
| Nitrite in Water by IC (Low Level) | | | | | | |
| *Nitrite (as N) | 0.0010 | | mg/L | 1 | | 24-OCT-19 |
| Nitrate in Water by IC (Low Level) | | | | | | |
| *Nitrate (as N) | 0.0910 | | mg/L | 10 | | 24-OCT-19 |
| Fluoride in Water by IC | | | | | | |
| Fluoride (F) | <0.10 | DLCI | mg/L | 1.5 | | 24-OCT-19 |
| Chloride in Water by IC | | | | | | |
| Chloride (Cl) | 72.9 | | mg/L | | 250 | 24-OCT-19 |
| Bromide in Water by IC (Low Level) | | | | | | |
| Bromide (Br) | <0.050 | | mg/L | | | 24-OCT-19 |
| Biochemical Oxygen Demand | <2.0 | | mg/L | | | 23-OCT-19 |
| COD | 41 | | mg/L | | | 30-OCT-19 |
| Colour, True | <5.0 | | CU | | 15 | 24-OCT-19 |
| Dissolved Organic Carbon | 15.5 | | mg/L | | | 24-OCT-19 |
| Hardness (as CaCO3) | 155 | HTC | mg/L | | 500 | 24-OCT-19 |
| Oil and Grease | <5.0 | | mg/L | | | 30-OCT-19 |
| Phenols (4AAP) | <0.0010 | | mg/L | | | 28-OCT-19 |
| Cyanide, Total | <0.0050 | | mg/L | 0.2 | | 28-OCT-19 |
| Total Dissolved Solids | 339 | | mg/L | | 500 | 25-OCT-19 |
| Mercury (Hg)-Total | <0.0000050 | | mg/L | 0.001 | | 26-OCT-19 |
| Total Suspended Solids | <3.0 | | mg/L | | | 24-OCT-19 |
| Total Organic Carbon | 16.2 | | mg/L | | | 24-OCT-19 |
| *Turbidity | 1.05 | | NTU | | | 24-OCT-19 |
| pH | 8.09 | | pH | | 7-10.5 | 24-OCT-19 |

ADDRESS: 314 Old Airport Road, Unit 116, Yellowknife, NT X1A 3T3 Canada | Phone: +1 867 873 5593 |
 ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company



AWC SOLUTIONS
 9087A 198 Street,
 Langley BC V1M 3B1
 ATTN: Jainish Patel

Date: 31-OCT-19
PO No.:
WO No.: L2368827
Project Ref: 10338G
Sample ID: WASTE WATER
Sampled By:
Date Collected: 21-OCT-19
Lab Sample ID: L2368827-1
Matrix: WATER


| Test Description | Result | Qualifier | Units of Measure | CDWQG MAC | Aesthetic Objective | Date Analyzed |
|---|-----------|-----------|------------------|-----------|---------------------|---------------|
| Total Metals in Water by CRC ICPMS | | | | | | |
| Aluminum (Al)-Total | 0.0933 | | mg/L | | 0.1 | 24-OCT-19 |
| Antimony (Sb)-Total | 0.00022 | | mg/L | 0.006 | | 24-OCT-19 |
| Arsenic (As)-Total | 0.00034 | | mg/L | 0.01 | | 24-OCT-19 |
| Barium (Ba)-Total | 0.0237 | | mg/L | 1 | | 24-OCT-19 |
| Beryllium (Be)-Total | <0.00010 | | mg/L | | | 24-OCT-19 |
| Bismuth (Bi)-Total | 0.000412 | | mg/L | | | 24-OCT-19 |
| Boron (B)-Total | 0.024 | | mg/L | 5 | | 24-OCT-19 |
| Cadmium (Cd)-Total | 0.0000262 | | mg/L | 0.005 | | 24-OCT-19 |
| Calcium (Ca)-Total | 36.9 | | mg/L | | | 24-OCT-19 |
| Cesium (Cs)-Total | <0.000010 | | mg/L | | | 24-OCT-19 |
| Chromium (Cr)-Total | 0.00576 | | mg/L | 0.05 | | 24-OCT-19 |
| Cobalt (Co)-Total | 0.00022 | | mg/L | | | 24-OCT-19 |
| Copper (Cu)-Total | 0.0299 | | mg/L | 2.0 | 1.0 | 24-OCT-19 |
| Iron (Fe)-Total | 0.144 | | mg/L | | 0.3 | 24-OCT-19 |
| Lead (Pb)-Total | 0.000637 | | mg/L | 0.005 | | 24-OCT-19 |
| Lithium (Li)-Total | 0.0043 | | mg/L | | | 24-OCT-19 |
| Magnesium (Mg)-Total | 15.3 | | mg/L | | | 24-OCT-19 |
| Manganese (Mn)-Total | 0.00700 | | mg/L | 0.12 | 0.02 | 24-OCT-19 |
| Molybdenum (Mo)-Total | 0.000673 | | mg/L | | | 24-OCT-19 |
| Nickel (Ni)-Total | 0.00303 | | mg/L | | | 24-OCT-19 |
| Phosphorus (P)-Total | 0.612 | | mg/L | | | 24-OCT-19 |
| Potassium (K)-Total | 3.30 | | mg/L | | | 24-OCT-19 |
| Rubidium (Rb)-Total | 0.00197 | | mg/L | | | 24-OCT-19 |
| Selenium (Se)-Total | 0.000064 | | mg/L | 0.05 | | 24-OCT-19 |
| Silicon (Si)-Total | 1.39 | | mg/L | | | 24-OCT-19 |
| Silver (Ag)-Total | 0.000033 | | mg/L | | | 24-OCT-19 |
| Sodium (Na)-Total | 62.4 | | mg/L | | 200 | 24-OCT-19 |
| Strontium (Sr)-Total | 0.196 | | mg/L | 7 | | 24-OCT-19 |
| Sulfur (S)-Total | 18.0 | | mg/L | | | 24-OCT-19 |
| Tellurium (Te)-Total | <0.00020 | | mg/L | | | 24-OCT-19 |
| Thallium (Tl)-Total | <0.000010 | | mg/L | | | 24-OCT-19 |
| Thorium (Th)-Total | <0.00010 | | mg/L | | | 24-OCT-19 |
| Tin (Sn)-Total | 0.00077 | | mg/L | | | 24-OCT-19 |
| Titanium (Ti)-Total | 0.00188 | | mg/L | | | 24-OCT-19 |
| Tungsten (W)-Total | 0.00013 | | mg/L | | | 24-OCT-19 |
| Uranium (U)-Total | 0.00139 | | mg/L | 0.02 | | 24-OCT-19 |
| Vanadium (V)-Total | <0.00050 | | mg/L | | | 24-OCT-19 |
| Zinc (Zn)-Total | 0.0456 | | mg/L | | 5.0 | 24-OCT-19 |
| Zirconium (Zr)-Total | <0.00020 | | mg/L | | | 24-OCT-19 |

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AWC SOLUTIONS
 9087A 198 Street,
 Langley BC V1M 3B1
 ATTN: Jainish Patel


Date: 31-OCT-19
PO No.:
WO No.: L2368827
Project Ref: 10338G
Sample ID: WASTE WATER
Sampled By:
Date Collected: 21-OCT-19
Lab Sample ID: L2368827-1
Matrix: WATER

| Test Description | Result | Qualifier | Units of Measure | CDWQG MAC | Aesthetic Objective | Date Analyzed |
|--|--------|-----------|------------------|-----------|---------------------|---------------|
| <p>CDWQG = Health Canada Guideline Limits updated JUNE 2019</p> <p>* CDWQG for Nitrate+Nitrite-N is the limit for nitrate only. If present as Nitrate then the limit is 10mg/L < or N.D. = less than detection limit. * Turbidity guideline based on membrane filtration. For guidelines on conventional treatment and slow sand or diatomaceous earth filtration please see Summary Table of Guidelines for Canadian Drinking Water Quality - A blank entry designates no known limit. - A shaded value in the Results column exceeds CDWQG MAC and/ or Aesthetic Objective.</p> | | | | | | |
| <p>Approved by  _____ Oliver Gregg Account Manager</p> | | | | | | |



AWC SOLUTIONS
 9087A 198 Street,
 Langley BC V1M 3B1
 ATTN: Jainish Patel

Date: 31-OCT-19
PO No.:
WO No.: L2368827
Project Ref: 10338G
Sample ID: TREATED WATER
Sampled By:
Date Collected: 21-OCT-19
Lab Sample ID: L2368827-2
Matrix: WATER

| Test Description | Result | Qualifier | Units of Measure | CDWQG MAC | Aesthetic Objective | Date Analyzed |
|--|--------|-----------|------------------|-----------|---------------------|---------------|
| MPN-Fecal Coliform | <1 | | MPN/100mL | | | 21-OCT-19 |
| Total Coliform and E.coli | | | | | | |
| Total Coliforms | <1 | | MPN/100mL | 0 | | 21-OCT-19 |
| Escherichia Coli | <1 | | MPN/100mL | 0 | | 21-OCT-19 |
| <p>CDWQG = Health Canada Guideline Limits updated JUNE 2019</p> <p>* CDWQG for Nitrate+Nitrite-N is the limit for nitrate only. If present as Nitrate then the limit is 10mg/L < or N.D. = less than detection limit. * Turbidity guideline based on membrane filtration. For guidelines on conventional treatment and slow sand or diatomaceous earth filtration please see Summary Table of Guidelines for Canadian Drinking Water Quality - A blank entry designates no known limit. - A shaded value in the Results column exceeds CDWQG MAC and/ or Aesthetic Objective.</p> | | | | | | |
| <p>Approved by  _____ Oliver Gregg Account Manager</p> | | | | | | |

Guidelines & Objectives

Sample Parameter Qualifier key listed:

| Qualifier | Description |
|-----------|--|
| DLCI | Detection Limit Raised: Chromatographic Interference due to co-elution. |
| HTC | Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable). |

Health Canada MAC Health Related Criteria Limits

| | |
|--------------------|--|
| Nitrate/Nitrite-N* | Criteria limit is 10 mg/L (1.0 mg/L if present as all Nitrite-N). High concentrations may contribute to blue baby syndrome in infants. |
| Lead* | A cumulative body poison, uncommon in naturally occurring hard waters. |
| Fluoride* | Present in fluoridated water supplies at 0.8 mg/L to reduce dental caries. Elevated levels causes fluorosis (mottling of teeth). |
| Total Coliforms* | Criteria is 0 CFU/100mL. Adverse health effects. |
| E. Coli* | Criteria is 0 CFU/100 mL. Certain E. Coli bacteria can be life threatening. |
| Manganese* | Criteria limit is 0.12 mg/L. Possible neurological effects in infants. |

*Health Canada Canadian Drinking Water Quality Guidelines (MAC limit)

Aesthetic Objective Concentration Levels

| | |
|------------------------|--|
| Alkalinity | Acid neutralizing capacity. Usually a measure of carbonate and bicarbonates and calculated and reported as calcium carbonate. |
| Balance | Quality control parameter ratioing cations to anions |
| Bicarbonate | See Alkalinity. Report as the anion HCO ₃ -1 |
| Carbonate | See Alkalinity. Reported at the anion CO ₃ -2 |
| Calcium | See Hardness. Common major cation of water chemistry. |
| Chloride | Common major anion of water chemistry. |
| Conductance | Physical test measuring water salinity (dissolved ions or solids) |
| Hardness | Classical measure or capacity of water to precipitate soap (chiefly calcium and magnesium ions). Causes scaling tendency in water if carbonates/bicarbonates are present (if >200 mg/L). For drinking water purposes waters with results <200 mg/L are considered acceptable, results >200 mg/L are considered poor but can be tolerated. Results >500 mg/L are unacceptable. |
| Hydroxide | See alkalinity |
| Magnesium | See hardness. Common major cation of water chemistry. Elevated levels (>125 mg/L) may exert a cathartic or diuretic action. |
| pH | Measure of water acidity/alkalinity. Normal range is 7.0-8.5. |
| Potassium | Common major cation of water chemistry. |
| Sodium | Common major cation of water chemistry. Measure of salinity (saltiness).The aesthetic objective (not related to health) for sodium in drinking water is 200 mg/L. However, where sodium concentration of the drinking water exceeds 20 mg/L, it is recommended that any person on a sodium restricted diet consult with his/her physician or Medical Officer of Health concerning the use of that water. |
| Sulphate | Common major anion of water chemistry. Elevated levels may exert a cathartic or diuretic action. |
| Total Dissolved Solids | A measure of water salinity. |
| Iron | Causes staining to laundry and porcelain and astringent taste. Oxidizes to red-brown precipitate on exposure to air. |
| Heterotrophic | |
| Plate Count | Criteria is 500 cfu/mL Measure of heterotrophic bacteria present. |

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



AWC SOLUTIONS
 9087A 198 Street,
 Langley BC V1M 3B1
 ATTN: Jainish Patel

Date: 31-OCT-19
PO No.:
WO No.: L2368840
Project Ref: 10338-G
Sample ID: TREATED WATER - 24HRS
Sampled By:
Date Collected: 20-OCT-19
Lab Sample ID: L2368840-1
Matrix: WATER

| Test Description | Result | Qualifier | Units of Measure | CDWQG MAC | Aesthetic Objective | Date Analyzed |
|---|------------|-----------|------------------|-----------|---------------------|---------------|
| Alkalinity Species by Titration | | | | | | |
| Alkalinity Species by Titration | | | | | | |
| Alkalinity, Bicarbonate (as CaCO3) | 117 | | mg/L | | | 24-OCT-19 |
| Alkalinity, Carbonate (as CaCO3) | <1.0 | | mg/L | | | 24-OCT-19 |
| Alkalinity, Hydroxide (as CaCO3) | <1.0 | | mg/L | | | 24-OCT-19 |
| Alkalinity, Total (as CaCO3) | 117 | | mg/L | | | 24-OCT-19 |
| Anions by Ion Chromatography | | | | | | |
| Sulfate in Water by IC | | | | | | |
| Sulfate (SO4) | 50.1 | | mg/L | | 500 | 24-OCT-19 |
| Nitrite in Water by IC (Low Level) | | | | | | |
| *Nitrite (as N) | <0.0010 | | mg/L | 1 | | 24-OCT-19 |
| Nitrate in Water by IC (Low Level) | | | | | | |
| *Nitrate (as N) | 0.0090 | | mg/L | 10 | | 24-OCT-19 |
| Fluoride in Water by IC | | | | | | |
| Fluoride (F) | 0.149 | | mg/L | 1.5 | | 24-OCT-19 |
| Chloride in Water by IC | | | | | | |
| Chloride (Cl) | 13.4 | | mg/L | | 250 | 24-OCT-19 |
| Bromide in Water by IC (Low Level) | | | | | | |
| Bromide (Br) | <0.050 | | mg/L | | | 24-OCT-19 |
| Biochemical Oxygen Demand | <2.0 | | mg/L | | | 23-OCT-19 |
| COD | <20 | | mg/L | | | 28-OCT-19 |
| Colour, True | <5.0 | | CU | | 15 | 24-OCT-19 |
| Dissolved Organic Carbon | 5.68 | | mg/L | | | 24-OCT-19 |
| Hardness (as CaCO3) | 154 | HTC | mg/L | | 500 | 24-OCT-19 |
| Oil and Grease | <5.0 | | mg/L | | | 25-OCT-19 |
| Phenols (4AAP) | <0.0010 | | mg/L | | | 24-OCT-19 |
| MPN-Fecal Coliform | <1 | | MPN/100mL | | | 21-OCT-19 |
| Cyanide, Total | <0.0050 | | mg/L | 0.2 | | 24-OCT-19 |
| Total Dissolved Solids | 217 | | mg/L | | 500 | 24-OCT-19 |
| Mercury (Hg)-Total | <0.0000050 | | mg/L | 0.001 | | 26-OCT-19 |
| Total Suspended Solids | <3.0 | | mg/L | | | 24-OCT-19 |
| Total Organic Carbon | 6.32 | | mg/L | | | 24-OCT-19 |
| *Turbidity | 0.17 | | NTU | | | 24-OCT-19 |

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AWC SOLUTIONS
 9087A 198 Street,
 Langley BC V1M 3B1
 ATTN: Jainish Patel

Date: 31-OCT-19
PO No.:
WO No.: L2368840
Project Ref: 10338-G
Sample ID: TREATED WATER - 24HRS
Sampled By:
Date Collected: 20-OCT-19
Lab Sample ID: L2368840-1
Matrix: WATER


| Test Description | Result | Qualifier | Units of Measure | CDWQG MAC | Aesthetic Objective | Date Analyzed |
|---|-----------|-----------|------------------|-----------|---------------------|---------------|
| pH | 8.19 | | pH | | 7-10.5 | 24-OCT-19 |
| Total Metals in Water by CRC ICPMS | | | | | | |
| Aluminum (Al)-Total | 0.0281 | | mg/L | | 0.1 | 24-OCT-19 |
| Antimony (Sb)-Total | <0.00010 | | mg/L | 0.006 | | 24-OCT-19 |
| Arsenic (As)-Total | 0.00033 | | mg/L | 0.01 | | 24-OCT-19 |
| Barium (Ba)-Total | 0.0227 | | mg/L | 1 | | 24-OCT-19 |
| Beryllium (Be)-Total | <0.00010 | | mg/L | | | 24-OCT-19 |
| Bismuth (Bi)-Total | <0.000050 | | mg/L | | | 24-OCT-19 |
| Boron (B)-Total | 0.022 | | mg/L | 5 | | 24-OCT-19 |
| Cadmium (Cd)-Total | 0.0000079 | | mg/L | 0.005 | | 24-OCT-19 |
| Calcium (Ca)-Total | 35.9 | | mg/L | | | 24-OCT-19 |
| Cesium (Cs)-Total | <0.000010 | | mg/L | | | 24-OCT-19 |
| Chromium (Cr)-Total | 0.00050 | | mg/L | 0.05 | | 24-OCT-19 |
| Cobalt (Co)-Total | 0.00023 | | mg/L | | | 24-OCT-19 |
| Copper (Cu)-Total | 0.00545 | | mg/L | 2.0 | 1.0 | 24-OCT-19 |
| Iron (Fe)-Total | 0.049 | | mg/L | | 0.3 | 24-OCT-19 |
| Lead (Pb)-Total | 0.000376 | | mg/L | 0.005 | | 24-OCT-19 |
| Lithium (Li)-Total | 0.0043 | | mg/L | | | 24-OCT-19 |
| Magnesium (Mg)-Total | 15.6 | | mg/L | | | 24-OCT-19 |
| Manganese (Mn)-Total | 0.00151 | | mg/L | 0.12 | 0.02 | 24-OCT-19 |
| Molybdenum (Mo)-Total | 0.000406 | | mg/L | | | 24-OCT-19 |
| Nickel (Ni)-Total | 0.00132 | | mg/L | | | 24-OCT-19 |
| Phosphorus (P)-Total | <0.050 | | mg/L | | | 24-OCT-19 |
| Potassium (K)-Total | 1.87 | | mg/L | | | 24-OCT-19 |
| Rubidium (Rb)-Total | 0.00138 | | mg/L | | | 24-OCT-19 |
| Selenium (Se)-Total | <0.000050 | | mg/L | 0.05 | | 24-OCT-19 |
| Silicon (Si)-Total | 1.38 | | mg/L | | | 24-OCT-19 |
| Silver (Ag)-Total | <0.000010 | | mg/L | | | 24-OCT-19 |
| Sodium (Na)-Total | 19.4 | | mg/L | | 200 | 24-OCT-19 |
| Strontium (Sr)-Total | 0.194 | | mg/L | 7 | | 24-OCT-19 |
| Sulfur (S)-Total | 17.7 | | mg/L | | | 24-OCT-19 |
| Tellurium (Te)-Total | <0.00020 | | mg/L | | | 24-OCT-19 |
| Thallium (Tl)-Total | <0.000010 | | mg/L | | | 24-OCT-19 |
| Thorium (Th)-Total | <0.00010 | | mg/L | | | 24-OCT-19 |
| Tin (Sn)-Total | 0.00030 | | mg/L | | | 24-OCT-19 |
| Titanium (Ti)-Total | <0.00030 | | mg/L | | | 24-OCT-19 |
| Tungsten (W)-Total | <0.00010 | | mg/L | | | 24-OCT-19 |
| Uranium (U)-Total | 0.00133 | | mg/L | 0.02 | | 24-OCT-19 |
| Vanadium (V)-Total | <0.00050 | | mg/L | | | 24-OCT-19 |
| Zinc (Zn)-Total | 0.0969 | | mg/L | | 5.0 | 24-OCT-19 |
| Zirconium (Zr)-Total | <0.00020 | | mg/L | | | 24-OCT-19 |
| Total Coliform and E.coli | | | | | | |
| Total Coliforms | <1 | | MPN/100mL | 0 | | 21-OCT-19 |
| Escherichia Coli | <1 | | MPN/100mL | 0 | | 21-OCT-19 |

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AWC SOLUTIONS
9087A 198 Street,
Langley BC V1M 3B1
ATTN: Jainish Patel

Date: 31-OCT-19
PO No.:
WO No.: L2368840
Project Ref: 10338-G
Sample ID: TREATED WATER - 24HRS
Sampled By:
Date Collected: 20-OCT-19
Lab Sample ID: L2368840-1
Matrix: WATER

| Test Description | Result | Qualifier | Units of Measure | CDWQG MAC | Aesthetic Objective | Date Analyzed |
|---|------------------|-----------|------------------|-----------|---------------------|---------------|
| CDWQG = Health Canada Guideline Limits updated | JUNE 2019 | | | | | |
| <p>* CDWQG for Nitrate+Nitrite-N is the limit for nitrate only. If present as Nitrate then the limit is 10mg/L < or N.D. = less than detection limit. * Turbidity guideline based on membrane filtration. For guidelines on conventional treatment and slow sand or diatomaceous earth filtration please see Summary Table of Guidelines for Canadian Drinking Water Quality - A blank entry designates no known limit. - A shaded value in the Results column exceeds CDWQG MAC and/ or Aesthetic Objective.</p> | | | | | | |
| <p>Approved by  _____ Oliver Gregg Account Manager</p> | | | | | | |



Cash Clients
ATTN: Jainish Patel
9087A 198TH ST
LANGLEY BC V1M 3B1

Date Received: 19-AUG-20
Report Date: 10-SEP-20 14:49 (MT)
Version: FINAL

Client Phone: 604-936-4217

Certificate of Analysis

Lab Work Order #: L2491031
Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers: 17-818213
Legal Site Desc:

Oliver Gregg
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

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ALS ENVIRONMENTAL ANALYTICAL REPORT

| Sample Details/Parameters | Result | Qualifier* | D.L. | Units | Extracted | Analyzed | Batch |
|---|------------|------------|-----------|-------|-----------|-----------|----------|
| L2491031-1 TREATED AFTER BACKWASH | | | | | | | |
| Sampled By: CLIENT | | | | | | | |
| Matrix: | | | | | | | |
| Alkalinity Species by Titration | | | | | | | |
| Alkalinity Species by Titration | | | | | | | |
| Alkalinity, Bicarbonate (as CaCO3) | 103 | | 1.0 | mg/L | | 25-AUG-20 | R5199728 |
| Alkalinity, Carbonate (as CaCO3) | 4.8 | | 1.0 | mg/L | | 25-AUG-20 | R5199728 |
| Alkalinity, Hydroxide (as CaCO3) | <1.0 | | 1.0 | mg/L | | 25-AUG-20 | R5199728 |
| Alkalinity, Total (as CaCO3) | 108 | | 1.0 | mg/L | | 25-AUG-20 | R5199728 |
| Anions by Ion Chromatography | | | | | | | |
| Bromide in Water by IC (Low Level) | | | | | | | |
| Bromide (Br) | <0.050 | | 0.050 | mg/L | | 25-AUG-20 | R5200072 |
| Chloride in Water by IC | | | | | | | |
| Chloride (Cl) | 23.1 | | 0.50 | mg/L | | 25-AUG-20 | R5200072 |
| Fluoride in Water by IC | | | | | | | |
| Fluoride (F) | 0.153 | | 0.020 | mg/L | | 25-AUG-20 | R5200072 |
| Nitrate in Water by IC (Low Level) | | | | | | | |
| Nitrate (as N) | <0.0050 | | 0.0050 | mg/L | | 25-AUG-20 | R5200072 |
| Nitrite in Water by IC (Low Level) | | | | | | | |
| Nitrite (as N) | <0.0010 | | 0.0010 | mg/L | | 25-AUG-20 | R5200072 |
| Sulfate in Water by IC | | | | | | | |
| Sulfate (SO4) | 48.5 | | 0.30 | mg/L | | 25-AUG-20 | R5200072 |
| Miscellaneous Parameters | | | | | | | |
| Biochemical Oxygen Demand | <2.0 | | 2.0 | mg/L | | 19-AUG-20 | R5203061 |
| COD | <20 | | 20 | mg/L | | 26-AUG-20 | R5201944 |
| Dissolved Organic Carbon | 5.60 | | 0.50 | mg/L | | 27-AUG-20 | R5203927 |
| Hardness (as CaCO3) | 152 | HTC | 0.50 | mg/L | | 28-AUG-20 | |
| Oil and Grease | <5.0 | | 5.0 | mg/L | | 31-AUG-20 | R5204937 |
| Phenols (4AAP) | <0.0010 | | 0.0010 | mg/L | | 01-SEP-20 | R5208419 |
| Cyanide, Total | <0.0050 | | 0.0050 | mg/L | | 29-AUG-20 | R5204360 |
| Total Dissolved Solids | 219 | | 20 | mg/L | | 26-AUG-20 | R5203031 |
| Mercury (Hg)-Total | <0.0000050 | | 0.0000050 | mg/L | | 27-AUG-20 | R5202412 |
| Phosphorus (P)-Total | <0.0020 | | 0.0020 | mg/L | | 27-AUG-20 | R5202724 |
| Sulphide as S | <0.018 | | 0.018 | mg/L | | 26-AUG-20 | R5202741 |
| Total Suspended Solids | <3.0 | | 3.0 | mg/L | | 26-AUG-20 | R5202995 |
| Total Organic Carbon | 4.72 | | 0.50 | mg/L | | 27-AUG-20 | R5203927 |
| Turbidity | <0.10 | | 0.10 | NTU | | 25-AUG-20 | R5201047 |
| pH | 8.27 | | 0.10 | pH | | 25-AUG-20 | R5199728 |
| Total Metals in Water by CRC ICPMS | | | | | | | |
| Aluminum (Al)-Total | 0.0245 | | 0.0030 | mg/L | | 28-AUG-20 | R5203872 |
| Antimony (Sb)-Total | <0.00010 | | 0.00010 | mg/L | | 28-AUG-20 | R5203872 |
| Arsenic (As)-Total | 0.00028 | | 0.00010 | mg/L | | 28-AUG-20 | R5203872 |
| Barium (Ba)-Total | 0.0226 | | 0.00010 | mg/L | | 28-AUG-20 | R5203872 |
| Beryllium (Be)-Total | <0.00010 | | 0.00010 | mg/L | | 28-AUG-20 | R5203872 |
| Bismuth (Bi)-Total | <0.000050 | | 0.000050 | mg/L | | 28-AUG-20 | R5203872 |
| Boron (B)-Total | 0.024 | | 0.010 | mg/L | | 28-AUG-20 | R5203872 |
| Cadmium (Cd)-Total | <0.0000050 | | 0.0000050 | mg/L | | 28-AUG-20 | R5203872 |
| Calcium (Ca)-Total | 36.4 | | 0.050 | mg/L | | 28-AUG-20 | R5203872 |
| Cesium (Cs)-Total | <0.000010 | | 0.000010 | mg/L | | 28-AUG-20 | R5203872 |
| Chromium (Cr)-Total | 0.00030 | | 0.00010 | mg/L | | 28-AUG-20 | R5203872 |
| Cobalt (Co)-Total | <0.00010 | | 0.00010 | mg/L | | 28-AUG-20 | R5203872 |
| Copper (Cu)-Total | 0.00170 | | 0.00050 | mg/L | | 28-AUG-20 | R5203872 |
| Iron (Fe)-Total | <0.010 | | 0.010 | mg/L | | 28-AUG-20 | R5203872 |
| Lead (Pb)-Total | <0.000050 | | 0.000050 | mg/L | | 28-AUG-20 | R5203872 |

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| Sample Details/Parameters | Result | Qualifier* | D.L. | Units | Extracted | Analyzed | Batch |
|---|-----------|------------|----------|-----------|-----------|-----------|----------|
| L2491031-1 TREATED AFTER BACKWASH | | | | | | | |
| Sampled By: CLIENT | | | | | | | |
| Matrix: | | | | | | | |
| Total Metals in Water by CRC ICPMS | | | | | | | |
| Lithium (Li)-Total | 0.0044 | | 0.0010 | mg/L | | 28-AUG-20 | R5203872 |
| Magnesium (Mg)-Total | 14.9 | | 0.0050 | mg/L | | 28-AUG-20 | R5203872 |
| Manganese (Mn)-Total | 0.00052 | | 0.00010 | mg/L | | 28-AUG-20 | R5203872 |
| Molybdenum (Mo)-Total | 0.000394 | | 0.000050 | mg/L | | 28-AUG-20 | R5203872 |
| Nickel (Ni)-Total | <0.00050 | | 0.00050 | mg/L | | 28-AUG-20 | R5203872 |
| Phosphorus (P)-Total | <0.050 | | 0.050 | mg/L | | 28-AUG-20 | R5203872 |
| Potassium (K)-Total | 1.80 | | 0.050 | mg/L | | 28-AUG-20 | R5203872 |
| Rubidium (Rb)-Total | 0.00135 | | 0.00020 | mg/L | | 28-AUG-20 | R5203872 |
| Selenium (Se)-Total | <0.000050 | | 0.000050 | mg/L | | 28-AUG-20 | R5203872 |
| Silicon (Si)-Total | 1.23 | | 0.10 | mg/L | | 28-AUG-20 | R5203872 |
| Silver (Ag)-Total | <0.000010 | | 0.000010 | mg/L | | 28-AUG-20 | R5203872 |
| Sodium (Na)-Total | 15.4 | | 0.050 | mg/L | | 28-AUG-20 | R5203872 |
| Strontium (Sr)-Total | 0.202 | | 0.00020 | mg/L | | 28-AUG-20 | R5203872 |
| Sulfur (S)-Total | 17.1 | | 0.50 | mg/L | | 28-AUG-20 | R5203872 |
| Tellurium (Te)-Total | <0.00020 | | 0.00020 | mg/L | | 28-AUG-20 | R5203872 |
| Thallium (Tl)-Total | <0.000010 | | 0.000010 | mg/L | | 28-AUG-20 | R5203872 |
| Thorium (Th)-Total | <0.00010 | | 0.00010 | mg/L | | 28-AUG-20 | R5203872 |
| Tin (Sn)-Total | <0.00010 | | 0.00010 | mg/L | | 28-AUG-20 | R5203872 |
| Titanium (Ti)-Total | <0.00030 | | 0.00030 | mg/L | | 28-AUG-20 | R5203872 |
| Tungsten (W)-Total | <0.00010 | | 0.00010 | mg/L | | 28-AUG-20 | R5203872 |
| Uranium (U)-Total | 0.00138 | | 0.000010 | mg/L | | 28-AUG-20 | R5203872 |
| Vanadium (V)-Total | <0.00050 | | 0.00050 | mg/L | | 28-AUG-20 | R5203872 |
| Zinc (Zn)-Total | <0.0030 | | 0.0030 | mg/L | | 28-AUG-20 | R5203872 |
| Zirconium (Zr)-Total | <0.00020 | | 0.00020 | mg/L | | 28-AUG-20 | R5203872 |
| Total Coliforms and E. Coli by MPN | | | | | | | |
| E. Coli by MPN | | | | | | | |
| MPN - E. coli | <1 | | 1 | MPN/100mL | | 19-AUG-20 | R5203061 |
| Total Coliforms by MPN | | | | | | | |
| MPN - Total Coliforms | <1 | | 1 | MPN/100mL | | 19-AUG-20 | R5203061 |

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Sample Parameter Qualifier Key:

| Qualifier | Description |
|-----------|--|
| B | Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable. |
| HTC | Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable). |
| MB-LOR | Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level. |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |

Test Method References:

| ALS Test Code | Matrix | Test Description | Method Reference** |
|---|--------|--|---------------------------------------|
| ALK-TITR-VA | Water | Alkalinity Species by Titration | APHA 2320 Alkalinity |
| This analysis is carried out using procedures adapted from APHA Method 2320 "Alkalinity". Total alkalinity is determined by potentiometric titration to a pH 4.5 endpoint. Bicarbonate, carbonate and hydroxide alkalinity are calculated from phenolphthalein alkalinity and total alkalinity values. | | | |
| BOD5-TG | Water | Biochemical Oxygen Demand- 5 day (TAIGA) | SM5210B |
| BR-L-IC-N-VA | Water | Bromide in Water by IC (Low Level) | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| CARBONS-DOC-VA | Water | Dissolved organic carbon by combustion | APHA 5310B |
| This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". Dissolved carbon (DOC) fractions are determined by filtering the sample through a 0.45 micron membrane filter prior to analysis. | | | |
| CARBONS-TOC-VA | Water | Total organic carbon by combustion | APHA 5310B TOTAL ORGANIC CARBON (TOC) |
| This analysis is carried out using procedures adapted from APHA Method 5310 "Total Organic Carbon (TOC)". | | | |
| CL-IC-N-VA | Water | Chloride in Water by IC | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| CN-T-CFA-VA | Water | Total Cyanide in water by CFA | ISO 14403:2002 |
| This analysis is carried out using procedures adapted from ISO Method 14403:2002 "Determination of Total Cyanide using Flow Analysis (FIA and CFA)". Total or strong acid dissociable (SAD) cyanide is determined by in-line UV digestion along with sample distillation and final determination by colourimetric analysis. Method Limitation: This method is susceptible to interference from thiocyanate (SCN). If SCN is present in the sample, there could be a positive interference with this method, but it would be less than 1% and could be as low as zero. | | | |
| COD-COL-VA | Water | Chemical Oxygen Demand by Colorimetric | APHA 5220 D. CHEMICAL OXYGEN DEMAND |
| This analysis is carried out using procedures adapted from APHA Method 5220 "Chemical Oxygen Demand (COD)". Chemical oxygen demand is determined using the closed reflux colourimetric method. | | | |
| EC-MPN-TG | Water | E. Coli by MPN | SM9223B |
| EC-SCREEN-VA | Water | Conductivity Screen (Internal Use Only) | APHA 2510 |
| Qualitative analysis of conductivity where required during preparation of other tests - e.g. TDS, metals, etc. | | | |
| F-IC-N-VA | Water | Fluoride in Water by IC | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| HARDNESS-CALC-VA | Water | Hardness | APHA 2340B |
| Hardness (also known as Total Hardness) is calculated from the sum of Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. Dissolved Calcium and Magnesium concentrations are preferentially used for the hardness calculation. | | | |
| HG-T-CVAA-VA | Water | Total Mercury in Water by CVAAS or CVAFS | EPA 1631E (mod) |
| Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS or CVAFS. | | | |
| MET-T-CCMS-VA | Water | Total Metals in Water by CRC ICPMS | EPA 200.2/6020A (mod) |
| Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS. | | | |
| Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method. | | | |
| NO2-L-IC-N-VA | Water | Nitrite in Water by IC (Low Level) | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| NO3-L-IC-N-VA | Water | Nitrate in Water by IC (Low Level) | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| OGG-SF-VA | Water | Oil & Grease by Gravimetric | BCMOE (2010), EPA1664A |

Reference Information

Test Method References:

| ALS Test Code | Matrix | Test Description | Method Reference** |
|-----------------|--------|--|------------------------------------|
| | | The procedure involves an extraction of the entire water sample with hexane. This extract is then evaporated to dryness, and the residue weighed to determine Oil and Grease. | |
| P-T-PRES-COL-VA | Water | Total P in Water by Colour | APHA 4500-P Phosphorus |
| | | This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample. Samples with very high dissolved solids (i.e. seawaters, brackish waters) may produce a negative bias by this method. Alternate methods are available for these types of samples. | |
| | | Arsenic (5+), at elevated levels, is a positive interference on colourimetric phosphate analysis. | |
| PH-PCT-VA | Water | pH by Meter (Automated) | APHA 4500-H pH Value |
| | | This analysis is carried out using procedures adapted from APHA Method 4500-H "pH Value". The pH is determined in the laboratory using a pH electrode | |
| | | It is recommended that this analysis be conducted in the field. | |
| PHENOLS-4AAP-ED | Water | Phenols (4AAP) | EPA 9066 AUTO-DISTILL-COLORIMETRIC |
| | | This automated method is based on the distillation of phenol and subsequent reaction of the distillate with an oxidizing agent (alkaline potassium ferricyanide), and 4-aminoantipyrine to form a red complex which is measured at 505 nm. The method will include ortho and meta-substituted phenols, and is collectively named 4AAP phenols. | |
| S2-T-COL-VA | Water | Total Sulphide by Colorimetric | APHA 4500-S2 Sulphide |
| | | This analysis is carried out using procedures adapted from APHA Method 4500-S2 "Sulphide". Sulphide is determined using the methylene blue colourimetric method. | |
| SO4-IC-N-VA | Water | Sulfate in Water by IC | EPA 300.1 (mod) |
| | | Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | |
| TC-MPN-TG | Water | Total Coliforms by MPN | SM9223B |
| TDS-VA | Water | Total Dissolved Solids by Gravimetric | APHA 2540 C - GRAVIMETRIC |
| | | This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, TDS is determined by evaporating the filtrate to dryness at 180 degrees celsius. | |
| TSS-VA | Water | Total Suspended Solids by Gravimetric | APHA 2540 D - GRAVIMETRIC |
| | | This analysis is carried out using procedures adapted from APHA Method 2540 "Solids". Solids are determined gravimetrically. Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, TSS is determined by drying the filter at 104 degrees celsius. Samples containing very high dissolved solid content (i.e. seawaters, brackish waters) may produce a positive bias by this method. Alternate analysis methods are available for these types of samples. | |
| TURBIDITY-VA | Water | Turbidity by Meter | APHA 2130 Turbidity |
| | | This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method. | |

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

| Laboratory Definition Code | Laboratory Location |
|----------------------------|---|
| ED | ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA |
| VA | ALS ENVIRONMENTAL - VANCOUVER, BRITISH COLUMBIA, CANADA |
| TG | TAIGA ENVIRONMENTAL LABORATORY (INAC) |

Chain of Custody Numbers:

17-818213

Reference Information

Test Method References:

| ALS Test Code | Matrix | Test Description | Method Reference** |
|---------------|--------|------------------|--------------------|
|---------------|--------|------------------|--------------------|

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2491031

Report Date: 10-SEP-20

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Client: Cash Clients
 9087A 198TH ST
 LANGLEY BC V1M 3B1

Contact: Jainish Patel

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|------------------------------|-----------------|-------------------|--------|-----------|-------|-----|--------|-----------|
| ALK-TITR-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R5199728 | | | | | | | |
| WG3390254-3 | LCS | | | | | | | |
| Alkalinity, Total (as CaCO3) | | | 98.0 | | % | | 85-115 | 25-AUG-20 |
| WG3390254-1 | MB | | | | | | | |
| Alkalinity, Total (as CaCO3) | | | 1.1 | B | mg/L | | 1 | 25-AUG-20 |
| BR-L-IC-N-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R5200072 | | | | | | | |
| WG3390251-2 | LCS | | | | | | | |
| Bromide (Br) | | | 101.0 | | % | | 85-115 | 25-AUG-20 |
| WG3390251-1 | MB | | | | | | | |
| Bromide (Br) | | | <0.050 | | mg/L | | 0.05 | 25-AUG-20 |
| CARBONS-DOC-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R5203927 | | | | | | | |
| WG3392208-2 | LCS | | | | | | | |
| Dissolved Organic Carbon | | | 108.2 | | % | | 80-120 | 27-AUG-20 |
| WG3392503-2 | LCS | | | | | | | |
| Dissolved Organic Carbon | | | 104.1 | | % | | 80-120 | 27-AUG-20 |
| WG3392208-1 | MB | | | | | | | |
| Dissolved Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 27-AUG-20 |
| WG3392503-1 | MB | | | | | | | |
| Dissolved Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 27-AUG-20 |
| WG3392208-4 | MS | L2491031-1 | | | | | | |
| Dissolved Organic Carbon | | | N/A | MS-B | % | | - | 27-AUG-20 |
| CARBONS-TOC-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R5203927 | | | | | | | |
| WG3392203-2 | LCS | | | | | | | |
| Total Organic Carbon | | | 103.1 | | % | | 80-120 | 27-AUG-20 |
| WG3392503-2 | LCS | | | | | | | |
| Total Organic Carbon | | | 106.5 | | % | | 80-120 | 27-AUG-20 |
| WG3392203-1 | MB | | | | | | | |
| Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 27-AUG-20 |
| WG3392503-1 | MB | | | | | | | |
| Total Organic Carbon | | | <0.50 | | mg/L | | 0.5 | 27-AUG-20 |
| CL-IC-N-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R5200072 | | | | | | | |
| WG3390251-2 | LCS | | | | | | | |
| Chloride (Cl) | | | 100.5 | | % | | 90-110 | 25-AUG-20 |
| WG3390251-1 | MB | | | | | | | |



Quality Control Report

Workorder: L2491031

Report Date: 10-SEP-20

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|----------------------|--------|-----------|------------|-----------|-------|-----|----------|-----------|
| CL-IC-N-VA | | | | | | | | |
| Water | | | | | | | | |
| Batch R5200072 | | | | | | | | |
| WG3390251-1 MB | | | | | | | | |
| Chloride (Cl) | | | | | | | | |
| | | | <0.50 | | mg/L | | 0.5 | 25-AUG-20 |
| CN-T-CFA-VA | | | | | | | | |
| Water | | | | | | | | |
| Batch R5204360 | | | | | | | | |
| WG3394202-2 LCS | | | | | | | | |
| Cyanide, Total | | | | | | | | |
| | | | 97.8 | | % | | 80-120 | 29-AUG-20 |
| WG3394202-1 MB | | | | | | | | |
| Cyanide, Total | | | | | | | | |
| | | | <0.0050 | | mg/L | | 0.005 | 29-AUG-20 |
| COD-COL-VA | | | | | | | | |
| Water | | | | | | | | |
| Batch R5201944 | | | | | | | | |
| WG3391869-3 LCS | | | | | | | | |
| COD | | | | | | | | |
| | | | 97.6 | | % | | 85-115 | 26-AUG-20 |
| WG3391869-1 MB | | | | | | | | |
| COD | | | | | | | | |
| | | | <20 | | mg/L | | 20 | 26-AUG-20 |
| F-IC-N-VA | | | | | | | | |
| Water | | | | | | | | |
| Batch R5200072 | | | | | | | | |
| WG3390251-2 LCS | | | | | | | | |
| Fluoride (F) | | | | | | | | |
| | | | 98.6 | | % | | 90-110 | 25-AUG-20 |
| WG3390251-1 MB | | | | | | | | |
| Fluoride (F) | | | | | | | | |
| | | | <0.020 | | mg/L | | 0.02 | 25-AUG-20 |
| HG-T-CVAA-VA | | | | | | | | |
| Water | | | | | | | | |
| Batch R5202412 | | | | | | | | |
| WG3392312-2 LCS | | | | | | | | |
| Mercury (Hg)-Total | | | | | | | | |
| | | | 97.9 | | % | | 80-120 | 27-AUG-20 |
| WG3392312-1 MB | | | | | | | | |
| Mercury (Hg)-Total | | | | | | | | |
| | | | <0.000005C | | mg/L | | 0.000005 | 27-AUG-20 |
| MET-T-CCMS-VA | | | | | | | | |
| Water | | | | | | | | |
| Batch R5203872 | | | | | | | | |
| WG3392822-2 LCS | | | | | | | | |
| Aluminum (Al)-Total | | | | | | | | |
| | | | 100.2 | | % | | 80-120 | 28-AUG-20 |
| Antimony (Sb)-Total | | | | | | | | |
| | | | 99.4 | | % | | 80-120 | 28-AUG-20 |
| Arsenic (As)-Total | | | | | | | | |
| | | | 98.8 | | % | | 80-120 | 28-AUG-20 |
| Barium (Ba)-Total | | | | | | | | |
| | | | 103.8 | | % | | 80-120 | 28-AUG-20 |
| Beryllium (Be)-Total | | | | | | | | |
| | | | 104.5 | | % | | 80-120 | 28-AUG-20 |
| Bismuth (Bi)-Total | | | | | | | | |
| | | | 98.1 | | % | | 80-120 | 28-AUG-20 |
| Boron (B)-Total | | | | | | | | |
| | | | 98.7 | | % | | 80-120 | 28-AUG-20 |



Quality Control Report

Workorder: L2491031

Report Date: 10-SEP-20

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|-----------|---------|-----------|-------|-----|--------|-----------|
| MET-T-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R5203872 | | | | | | | |
| WG3392822-2 | LCS | | | | | | | |
| Cadmium (Cd)-Total | | | 101.5 | | % | | 80-120 | 28-AUG-20 |
| Calcium (Ca)-Total | | | 102.9 | | % | | 80-120 | 28-AUG-20 |
| Cesium (Cs)-Total | | | 97.2 | | % | | 80-120 | 28-AUG-20 |
| Chromium (Cr)-Total | | | 103.6 | | % | | 80-120 | 28-AUG-20 |
| Cobalt (Co)-Total | | | 102.6 | | % | | 80-120 | 28-AUG-20 |
| Copper (Cu)-Total | | | 101.4 | | % | | 80-120 | 28-AUG-20 |
| Iron (Fe)-Total | | | 102.1 | | % | | 80-120 | 28-AUG-20 |
| Lead (Pb)-Total | | | 97.2 | | % | | 80-120 | 28-AUG-20 |
| Lithium (Li)-Total | | | 102.9 | | % | | 80-120 | 28-AUG-20 |
| Magnesium (Mg)-Total | | | 97.5 | | % | | 80-120 | 28-AUG-20 |
| Manganese (Mn)-Total | | | 101.3 | | % | | 80-120 | 28-AUG-20 |
| Molybdenum (Mo)-Total | | | 101.0 | | % | | 80-120 | 28-AUG-20 |
| Nickel (Ni)-Total | | | 101.8 | | % | | 80-120 | 28-AUG-20 |
| Phosphorus (P)-Total | | | 89.6 | | % | | 80-120 | 28-AUG-20 |
| Potassium (K)-Total | | | 102.1 | | % | | 80-120 | 28-AUG-20 |
| Rubidium (Rb)-Total | | | 103.8 | | % | | 80-120 | 28-AUG-20 |
| Selenium (Se)-Total | | | 104.7 | | % | | 80-120 | 28-AUG-20 |
| Silicon (Si)-Total | | | 106.1 | | % | | 80-120 | 28-AUG-20 |
| Silver (Ag)-Total | | | 96.7 | | % | | 80-120 | 28-AUG-20 |
| Sodium (Na)-Total | | | 100.0 | | % | | 80-120 | 28-AUG-20 |
| Strontium (Sr)-Total | | | 105.4 | | % | | 80-120 | 28-AUG-20 |
| Sulfur (S)-Total | | | 102.5 | | % | | 80-120 | 28-AUG-20 |
| Tellurium (Te)-Total | | | 97.9 | | % | | 80-120 | 28-AUG-20 |
| Thallium (Tl)-Total | | | 99.3 | | % | | 80-120 | 28-AUG-20 |
| Thorium (Th)-Total | | | 95.7 | | % | | 80-120 | 28-AUG-20 |
| Tin (Sn)-Total | | | 100.9 | | % | | 80-120 | 28-AUG-20 |
| Titanium (Ti)-Total | | | 97.4 | | % | | 80-120 | 28-AUG-20 |
| Tungsten (W)-Total | | | 97.8 | | % | | 80-120 | 28-AUG-20 |
| Uranium (U)-Total | | | 98.4 | | % | | 80-120 | 28-AUG-20 |
| Vanadium (V)-Total | | | 101.8 | | % | | 80-120 | 28-AUG-20 |
| Zinc (Zn)-Total | | | 100.7 | | % | | 80-120 | 28-AUG-20 |
| Zirconium (Zr)-Total | | | 100.7 | | % | | 80-120 | 28-AUG-20 |
| WG3392822-1 | MB | | | | | | | |
| Aluminum (Al)-Total | | | <0.0030 | | mg/L | | 0.003 | 28-AUG-20 |



Quality Control Report

Workorder: L2491031

Report Date: 10-SEP-20

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|-----------|------------|-----------|-------|-----|----------|-----------|
| MET-T-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R5203872 | | | | | | | |
| WG3392822-1 | MB | | | | | | | |
| Antimony (Sb)-Total | | | <0.00010 | | mg/L | | 0.0001 | 28-AUG-20 |
| Arsenic (As)-Total | | | <0.00010 | | mg/L | | 0.0001 | 28-AUG-20 |
| Barium (Ba)-Total | | | <0.00010 | | mg/L | | 0.0001 | 28-AUG-20 |
| Beryllium (Be)-Total | | | <0.00010 | | mg/L | | 0.0001 | 28-AUG-20 |
| Bismuth (Bi)-Total | | | <0.000050 | | mg/L | | 0.00005 | 28-AUG-20 |
| Boron (B)-Total | | | <0.010 | | mg/L | | 0.01 | 28-AUG-20 |
| Cadmium (Cd)-Total | | | <0.0000050 | | mg/L | | 0.000005 | 28-AUG-20 |
| Calcium (Ca)-Total | | | <0.050 | | mg/L | | 0.05 | 28-AUG-20 |
| Cesium (Cs)-Total | | | <0.000010 | | mg/L | | 0.00001 | 28-AUG-20 |
| Chromium (Cr)-Total | | | <0.00010 | | mg/L | | 0.0001 | 28-AUG-20 |
| Cobalt (Co)-Total | | | <0.00010 | | mg/L | | 0.0001 | 28-AUG-20 |
| Copper (Cu)-Total | | | 0.00194 | MB-LOR | mg/L | | 0.0005 | 28-AUG-20 |
| Iron (Fe)-Total | | | <0.010 | | mg/L | | 0.01 | 28-AUG-20 |
| Lead (Pb)-Total | | | <0.000050 | | mg/L | | 0.00005 | 28-AUG-20 |
| Lithium (Li)-Total | | | <0.0010 | | mg/L | | 0.001 | 28-AUG-20 |
| Magnesium (Mg)-Total | | | <0.0050 | | mg/L | | 0.005 | 28-AUG-20 |
| Manganese (Mn)-Total | | | 0.00015 | MB-LOR | mg/L | | 0.0001 | 28-AUG-20 |
| Molybdenum (Mo)-Total | | | <0.000050 | | mg/L | | 0.00005 | 28-AUG-20 |
| Nickel (Ni)-Total | | | <0.00050 | | mg/L | | 0.0005 | 28-AUG-20 |
| Phosphorus (P)-Total | | | <0.050 | | mg/L | | 0.05 | 28-AUG-20 |
| Potassium (K)-Total | | | <0.050 | | mg/L | | 0.05 | 28-AUG-20 |
| Rubidium (Rb)-Total | | | <0.00020 | | mg/L | | 0.0002 | 28-AUG-20 |
| Selenium (Se)-Total | | | <0.000050 | | mg/L | | 0.00005 | 28-AUG-20 |
| Silicon (Si)-Total | | | <0.10 | | mg/L | | 0.1 | 28-AUG-20 |
| Silver (Ag)-Total | | | <0.000010 | | mg/L | | 0.00001 | 28-AUG-20 |
| Sodium (Na)-Total | | | <0.050 | | mg/L | | 0.05 | 28-AUG-20 |
| Strontium (Sr)-Total | | | <0.00020 | | mg/L | | 0.0002 | 28-AUG-20 |
| Sulfur (S)-Total | | | <0.50 | | mg/L | | 0.5 | 28-AUG-20 |
| Tellurium (Te)-Total | | | 0.00033 | MB-LOR | mg/L | | 0.0002 | 28-AUG-20 |
| Thallium (Tl)-Total | | | <0.000010 | | mg/L | | 0.00001 | 28-AUG-20 |
| Thorium (Th)-Total | | | <0.00010 | | mg/L | | 0.0001 | 28-AUG-20 |
| Tin (Sn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 28-AUG-20 |
| Titanium (Ti)-Total | | | <0.00030 | | mg/L | | 0.0003 | 28-AUG-20 |
| Tungsten (W)-Total | | | <0.00010 | | mg/L | | 0.0001 | 28-AUG-20 |



Quality Control Report

Workorder: L2491031

Report Date: 10-SEP-20

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|------------------------|-----------------|-------------------|-----------|-----------|-------|-----|---------|-----------|
| MET-T-CCMS-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R5203872 | | | | | | | |
| WG3392822-1 | MB | | | | | | | |
| Uranium (U)-Total | | | <0.000010 | | mg/L | | 0.00001 | 28-AUG-20 |
| Vanadium (V)-Total | | | <0.00050 | | mg/L | | 0.0005 | 28-AUG-20 |
| Zinc (Zn)-Total | | | <0.0030 | | mg/L | | 0.003 | 28-AUG-20 |
| Zirconium (Zr)-Total | | | <0.00020 | | mg/L | | 0.0002 | 28-AUG-20 |
| NO2-L-IC-N-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R5200072 | | | | | | | |
| WG3390251-2 | LCS | | | | | | | |
| Nitrite (as N) | | | 99.8 | | % | | 90-110 | 25-AUG-20 |
| WG3390251-1 | MB | | | | | | | |
| Nitrite (as N) | | | <0.0010 | | mg/L | | 0.001 | 25-AUG-20 |
| NO3-L-IC-N-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R5200072 | | | | | | | |
| WG3390251-2 | LCS | | | | | | | |
| Nitrate (as N) | | | 100.3 | | % | | 90-110 | 25-AUG-20 |
| WG3390251-1 | MB | | | | | | | |
| Nitrate (as N) | | | <0.0050 | | mg/L | | 0.005 | 25-AUG-20 |
| OGG-SF-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R5204937 | | | | | | | |
| WG3394432-2 | LCS | | | | | | | |
| Oil and Grease | | | 102.2 | | % | | 70-130 | 31-AUG-20 |
| WG3394432-1 | MB | | | | | | | |
| Oil and Grease | | | <5.0 | | mg/L | | 5 | 31-AUG-20 |
| P-T-PRES-COL-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R5202724 | | | | | | | |
| WG3392204-2 | LCS | | | | | | | |
| Phosphorus (P)-Total | | | 98.9 | | % | | 80-120 | 27-AUG-20 |
| WG3392204-1 | MB | | | | | | | |
| Phosphorus (P)-Total | | | <0.0020 | | mg/L | | 0.002 | 27-AUG-20 |
| PH-PCT-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R5199728 | | | | | | | |
| WG3390254-2 | CRM | VA-PH7-BUF | | | | | | |
| pH | | | 7.00 | | pH | | 6.9-7.1 | 25-AUG-20 |
| PHENOLS-4AAP-ED | | | | | | | | |
| | Water | | | | | | | |

Quality Control Report

Workorder: L2491031

Report Date: 10-SEP-20

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|------------------------|-----------------|-------------------|---------|-----------|-------|-----|--------|-----------|
| PHENOLS-4AAP-ED | | | | | | | | |
| | Water | | | | | | | |
| Batch | R5208419 | | | | | | | |
| WG3395783-10 | LCS | | | | | | | |
| Phenols (4AAP) | | | 102.8 | | % | | 85-115 | 01-SEP-20 |
| WG3395783-14 | LCS | | | | | | | |
| Phenols (4AAP) | | | 108.0 | | % | | 85-115 | 01-SEP-20 |
| WG3395783-18 | LCS | | | | | | | |
| Phenols (4AAP) | | | 98.0 | | % | | 85-115 | 01-SEP-20 |
| WG3395783-2 | LCS | | | | | | | |
| Phenols (4AAP) | | | 103.6 | | % | | 85-115 | 01-SEP-20 |
| WG3395783-6 | LCS | | | | | | | |
| Phenols (4AAP) | | | 104.5 | | % | | 85-115 | 01-SEP-20 |
| WG3395783-1 | MB | | | | | | | |
| Phenols (4AAP) | | | <0.0010 | | mg/L | | 0.001 | 01-SEP-20 |
| WG3395783-13 | MB | | | | | | | |
| Phenols (4AAP) | | | <0.0010 | | mg/L | | 0.001 | 01-SEP-20 |
| WG3395783-17 | MB | | | | | | | |
| Phenols (4AAP) | | | <0.0010 | | mg/L | | 0.001 | 01-SEP-20 |
| WG3395783-5 | MB | | | | | | | |
| Phenols (4AAP) | | | <0.0010 | | mg/L | | 0.001 | 01-SEP-20 |
| WG3395783-9 | MB | | | | | | | |
| Phenols (4AAP) | | | <0.0010 | | mg/L | | 0.001 | 01-SEP-20 |
| S2-T-COL-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R5202741 | | | | | | | |
| WG3392082-2 | LCS | | | | | | | |
| Sulphide as S | | | 100.3 | | % | | 75-125 | 26-AUG-20 |
| WG3392082-1 | MB | | | | | | | |
| Sulphide as S | | | <0.018 | | mg/L | | 0.018 | 26-AUG-20 |
| WG3392082-4 | MS | L2491031-1 | | | | | | |
| Sulphide as S | | | 88.1 | | % | | 65-135 | 26-AUG-20 |
| SO4-IC-N-VA | | | | | | | | |
| | Water | | | | | | | |
| Batch | R5200072 | | | | | | | |
| WG3390251-2 | LCS | | | | | | | |
| Sulfate (SO4) | | | 101.5 | | % | | 90-110 | 25-AUG-20 |
| WG3390251-1 | MB | | | | | | | |
| Sulfate (SO4) | | | <0.30 | | mg/L | | 0.3 | 25-AUG-20 |
| TDS-VA | Water | | | | | | | |



Quality Control Report

Workorder: L2491031

Report Date: 10-SEP-20

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|------------------------|-----------------|-------------------|--------|-----------|-------|-----|--------|-----------|
| TDS-VA | | Water | | | | | | |
| Batch | R5203031 | | | | | | | |
| WG3391984-2 | LCS | | | | | | | |
| Total Dissolved Solids | | | 98.9 | | % | | 85-115 | 26-AUG-20 |
| WG3391984-1 | MB | | | | | | | |
| Total Dissolved Solids | | | <10 | | mg/L | | 10 | 26-AUG-20 |
| TSS-VA | | Water | | | | | | |
| Batch | R5202995 | | | | | | | |
| WG3391988-2 | LCS | | | | | | | |
| Total Suspended Solids | | | 93.3 | | % | | 85-115 | 26-AUG-20 |
| WG3391988-1 | MB | | | | | | | |
| Total Suspended Solids | | | <3.0 | | mg/L | | 3 | 26-AUG-20 |
| TURBIDITY-VA | | Water | | | | | | |
| Batch | R5201047 | | | | | | | |
| WG3390396-2 | CRM | VA-FORM-40 | | | | | | |
| Turbidity | | | 100.0 | | % | | 85-115 | 25-AUG-20 |
| WG3390396-5 | CRM | VA-FORM-40 | | | | | | |
| Turbidity | | | 99.5 | | % | | 85-115 | 25-AUG-20 |
| WG3390396-8 | CRM | VA-FORM-40 | | | | | | |
| Turbidity | | | 100.0 | | % | | 85-115 | 25-AUG-20 |
| WG3390396-1 | MB | | | | | | | |
| Turbidity | | | <0.10 | | NTU | | 0.1 | 25-AUG-20 |
| WG3390396-4 | MB | | | | | | | |
| Turbidity | | | <0.10 | | NTU | | 0.1 | 25-AUG-20 |
| WG3390396-7 | MB | | | | | | | |
| Turbidity | | | <0.10 | | NTU | | 0.1 | 25-AUG-20 |

Quality Control Report

Workorder: L2491031

Report Date: 10-SEP-20

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Legend:

| | |
|-------|---|
| Limit | ALS Control Limit (Data Quality Objectives) |
| DUP | Duplicate |
| RPD | Relative Percent Difference |
| N/A | Not Available |
| LCS | Laboratory Control Sample |
| SRM | Standard Reference Material |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| ADE | Average Desorption Efficiency |
| MB | Method Blank |
| IRM | Internal Reference Material |
| CRM | Certified Reference Material |
| CCV | Continuing Calibration Verification |
| CVS | Calibration Verification Standard |
| LCSD | Laboratory Control Sample Duplicate |

Sample Parameter Qualifier Definitions:

| Qualifier | Description |
|-----------|--|
| B | Method Blank exceeds ALS DQO. Associated sample results which are < Limit of Reporting or > 5 times blank level are considered reliable. |
| MB-LOR | Method Blank exceeds ALS DQO. Limits of Reporting have been adjusted for samples with positive hits below 5x blank level. |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |

Quality Control Report

Workorder: L2491031

Report Date: 10-SEP-20

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Hold Time Exceedances:

| ALS Product Description | Sample ID | Sampling Date | Date Processed | Rec. HT | Actual HT | Units | Qualifier |
|------------------------------------|-----------|---------------|-----------------|---------|-----------|-------|-----------|
| Physical Tests | | | | | | | |
| Turbidity by Meter | 1 | Not provided | 25-AUG-20 07:00 | 3 | 6 | days | EHT |
| pH by Meter (Automated) | 1 | Not provided | 25-AUG-20 21:42 | 0.25 | 153 | hours | EHTR-FM |
| Anions and Nutrients | | | | | | | |
| Nitrate in Water by IC (Low Level) | 1 | Not provided | 25-AUG-20 06:12 | 3 | 6 | days | EHT |
| Nitrite in Water by IC (Low Level) | 1 | Not provided | 25-AUG-20 06:12 | 3 | 6 | days | EHT |

Legend & Qualifier Definitions:

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
EHTR: Exceeded ALS recommended hold time prior to sample receipt.
EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
EHT: Exceeded ALS recommended hold time prior to analysis.
Rec. HT: ALS recommended hold time (see units).

Notes*:
Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2491031 were received on 19-AUG-20 12:40.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



Taiga Environmental Laboratory
4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:
200612

- FINAL REPORT -

Prepared For: ALS Environmental

Address: 314 Old Airport Road
Unit 116
Yellowknife, NT
X1A 2R1

Attn: Oliver Gregg

Facsimile:

Final report has been reviewed and approved by:

A handwritten signature in black ink, appearing to read 'Glen Hudy', is written over a horizontal line.

Glen Hudy
Quality Assurance Officer

NOTES:

- Test methods and data are validated by the laboratory's Quality Assurance Program. Taiga Environmental Laboratory is accredited by the Canadian Association for Laboratory Accreditation Inc. (CALA) to ISO/IEC 17025 as a testing laboratory for specific tests registered with CALA.
- Routine methods are based on recognized procedures from sources such as
 - Standard Methods for the Examination of Water and Wastewater APHA AWWA WEF;
 - Environment Canada
 - USEPA
- Samples shall be kept for thirty (30) days after the final report is issued. All microbiological samples shall be disposed of immediately upon completion of analysis to minimize biohazardous risks to laboratory personnel. Please contact the laboratory if you have any special requirements.
- Final results are based on the specific tests at the time of analysis and do not represent the conditions during sampling.

ReportDate: Wednesday, August 26, 2020

Print Date: *Wednesday, August 26, 2020*



Taiga Environmental Laboratory

4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9
Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:
200612

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **L2491031-1 TREATED AFTER
BACKWASH**

Taiga Sample ID: **001**

Client Project:

Sample Type: Water

Received Date: 20-Aug-20

Sampling Date: 18-Aug-20

Sampling Time: 13:13

Location:

Report Status: Final

| Test Parameter | Result | Detection Limit | Units | Analysis Date | Analytical Method * | Qualifier |
|--------------------------------------|--------|-----------------|-----------|---------------|---------------------|-----------|
| <u>Inorganics - Nutrients</u> | | | | | | |
| Biochemical Oxygen Demand | < 2 | 2 | mg/L | 19-Aug-20 | SM5210:B | |
| <u>Microbiology</u> | | | | | | |
| Coliforms, Total | < 1.0 | 1.0 | MPN/100ml | 19-Aug-20 | SM9223:B | |
| Escherichia coli | < 1.0 | 1.0 | MPN/100ml | 19-Aug-20 | SM9223:B | |

ReportDate: Wednesday, August 26, 2020

Print Date: *Wednesday, August 26, 2020*



Taiga Environmental Laboratory

4601-52nd Ave., Box 1320, Yellowknife, NT. X1A 2L9

Tel: (867)-767-9235 Fax: (867)-920-8740

Taiga Batch No.:

200612

- CERTIFICATE OF ANALYSIS -

Client Sample ID: **L2491031-1 TREATED AFTER
BACKWASH**

Taiga Sample ID: **001**

*** Taiga analytical methods are based on the following standard analytical methods**

SM - Standard Methods for the Examination of Water and Wastewater

EPA - United States Environmental Protection Agency

Comments *L2491031*

ReportDate: Wednesday, August 26, 2020

Print Date: *Wednesday, August 26, 2020*

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Cash Clients
ATTN: Jainish Patel
90875 198st
Langley BC V1M 3B1

Date Received: 29-SEP-20
Report Date: 13-OCT-20 09:04 (MT)
Version: FINAL

Client Phone: 604-936-4221

Certificate of Analysis

Lab Work Order #: L2509465
Project P.O. #: NOT SUBMITTED
Job Reference:
C of C Numbers: 17-818295
Legal Site Desc:

Oliver Gregg
Account Manager

[This report shall not be reproduced except in full without the written authority of the Laboratory.]

ADDRESS: 314 Old Airport Road, Unit 116, Yellowknife, NT X1A 3T3 Canada | Phone: +1 867 873 5593 |
ALS CANADA LTD Part of the ALS Group An ALS Limited Company

ALS ENVIRONMENTAL ANALYTICAL REPORT

| Sample Details/Parameters | Result | Qualifier* | D.L. | Units | Extracted | Analyzed | Batch |
|--|------------|------------|-----------|-------|-----------|-----------|----------|
| L2509465-1 CITRIC BACKWASH | | | | | | | |
| Sampled By: CLIENT on 20-SEP-20 @ 11:00 | | | | | | | |
| Matrix: GRAB | | | | | | | |
| Miscellaneous Parameters | | | | | | | |
| Biochemical Oxygen Demand | <2.0 | | 2.0 | mg/L | | 01-OCT-20 | R5244896 |
| Bromide (Br) | <0.050 | | 0.050 | mg/L | | 01-OCT-20 | R5244590 |
| Chloride (Cl) | 6.05 | | 0.50 | mg/L | | 01-OCT-20 | R5244590 |
| Dissolved Kjeldahl Nitrogen | 0.27 | | 0.20 | mg/L | 08-OCT-20 | 08-OCT-20 | R5252182 |
| Dissolved Organic Carbon | 4.4 | | 1.0 | mg/L | | 08-OCT-20 | R5251518 |
| Fluoride (F) | 0.059 | | 0.020 | mg/L | | 01-OCT-20 | R5244590 |
| Hardness (as CaCO3) | 244 | HTC | 0.13 | mg/L | | 08-OCT-20 | |
| Phosphorus (P)-Total Dissolved | <0.020 | | 0.020 | mg/L | 05-OCT-20 | 06-OCT-20 | R5248641 |
| Mercury (Hg)-Total | <0.0000050 | | 0.0000050 | mg/L | | 02-OCT-20 | R5244251 |
| Total Organic Carbon | 5.1 | | 1.0 | mg/L | | 07-OCT-20 | R5251518 |
| Phosphorus (P)-Total | <0.020 | | 0.020 | mg/L | 05-OCT-20 | 06-OCT-20 | R5248641 |
| Total Suspended Solids | <3.0 | | 3.0 | mg/L | | 02-OCT-20 | R5244159 |
| Turbidity | 0.20 | | 0.10 | NTU | | 02-OCT-20 | R5244321 |
| pH, Conductivity and Total Alkalinity | | | | | | | |
| pH | 8.17 | | 0.10 | pH | | 01-OCT-20 | R5243520 |
| Conductivity (EC) | 428 | | 2.0 | uS/cm | | 01-OCT-20 | R5243520 |
| Bicarbonate (HCO3) | 164 | | 5.0 | mg/L | | 01-OCT-20 | R5243520 |
| Carbonate (CO3) | <5.0 | | 5.0 | mg/L | | 01-OCT-20 | R5243520 |
| Hydroxide (OH) | <5.0 | | 5.0 | mg/L | | 01-OCT-20 | R5243520 |
| Alkalinity, Total (as CaCO3) | 135 | | 2.0 | mg/L | | 01-OCT-20 | R5243520 |
| Total Metals in Water by CRC ICPMS | | | | | | | |
| Aluminum (Al)-Total | 0.0259 | | 0.0030 | mg/L | | 08-OCT-20 | R5250865 |
| Antimony (Sb)-Total | <0.00010 | | 0.00010 | mg/L | | 08-OCT-20 | R5250865 |
| Arsenic (As)-Total | 0.00030 | | 0.00010 | mg/L | | 08-OCT-20 | R5250865 |
| Barium (Ba)-Total | 0.0436 | | 0.00010 | mg/L | | 08-OCT-20 | R5250865 |
| Beryllium (Be)-Total | <0.00010 | | 0.00010 | mg/L | | 08-OCT-20 | R5250865 |
| Bismuth (Bi)-Total | <0.000050 | | 0.000050 | mg/L | | 08-OCT-20 | R5250865 |
| Boron (B)-Total | <0.010 | | 0.010 | mg/L | | 08-OCT-20 | R5250865 |
| Cadmium (Cd)-Total | 0.0000441 | | 0.0000050 | mg/L | | 08-OCT-20 | R5251561 |
| Calcium (Ca)-Total | 51.8 | | 0.050 | mg/L | | 08-OCT-20 | R5250865 |
| Cesium (Cs)-Total | <0.000010 | | 0.000010 | mg/L | | 08-OCT-20 | R5250865 |
| Chromium (Cr)-Total | 0.00024 | | 0.00010 | mg/L | | 08-OCT-20 | R5250865 |
| Cobalt (Co)-Total | <0.00010 | | 0.00010 | mg/L | | 08-OCT-20 | R5250865 |
| Copper (Cu)-Total | 0.00620 | | 0.00050 | mg/L | | 08-OCT-20 | R5250865 |
| Iron (Fe)-Total | 0.037 | | 0.010 | mg/L | | 08-OCT-20 | R5250865 |
| Lead (Pb)-Total | 0.00217 | | 0.000050 | mg/L | | 08-OCT-20 | R5250865 |
| Lithium (Li)-Total | 0.0030 | | 0.0010 | mg/L | | 08-OCT-20 | R5250865 |
| Magnesium (Mg)-Total | 27.9 | | 0.0050 | mg/L | | 08-OCT-20 | R5250865 |
| Manganese (Mn)-Total | 0.0183 | | 0.00010 | mg/L | | 08-OCT-20 | R5250865 |
| Molybdenum (Mo)-Total | 0.000089 | | 0.000050 | mg/L | | 08-OCT-20 | R5250865 |
| Nickel (Ni)-Total | 0.00143 | | 0.00050 | mg/L | | 08-OCT-20 | R5250865 |
| Phosphorus (P)-Total | <0.050 | | 0.050 | mg/L | | 08-OCT-20 | R5250865 |
| Potassium (K)-Total | 0.762 | | 0.050 | mg/L | | 08-OCT-20 | R5250865 |
| Rubidium (Rb)-Total | 0.00036 | | 0.00020 | mg/L | | 08-OCT-20 | R5250865 |
| Selenium (Se)-Total | <0.000050 | | 0.000050 | mg/L | | 08-OCT-20 | R5250865 |
| Silicon (Si)-Total | 1.07 | | 0.10 | mg/L | | 08-OCT-20 | R5250865 |
| Silver (Ag)-Total | <0.000010 | | 0.000010 | mg/L | | 08-OCT-20 | R5250865 |
| Sodium (Na)-Total | 4.22 | | 0.050 | mg/L | | 08-OCT-20 | R5250865 |
| Strontium (Sr)-Total | 0.0551 | | 0.00020 | mg/L | | 08-OCT-20 | R5250865 |
| Sulfur (S)-Total | 35.6 | | 0.50 | mg/L | | 08-OCT-20 | R5250865 |

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| Sample Details/Parameters | Result | Qualifier* | D.L. | Units | Extracted | Analyzed | Batch |
|---|------------|------------|-----------|-------|-----------|-----------|----------|
| L2509465-1 CITRIC BACKWASH | | | | | | | |
| Sampled By: CLIENT on 20-SEP-20 @ 11:00 | | | | | | | |
| Matrix: GRAB | | | | | | | |
| Total Metals in Water by CRC ICPMS | | | | | | | |
| Tellurium (Te)-Total | <0.00020 | | 0.00020 | mg/L | | 08-OCT-20 | R5250865 |
| Thallium (Tl)-Total | <0.000010 | | 0.000010 | mg/L | | 08-OCT-20 | R5250865 |
| Thorium (Th)-Total | <0.00010 | | 0.00010 | mg/L | | 08-OCT-20 | R5250865 |
| Tin (Sn)-Total | 0.00072 | | 0.00010 | mg/L | | 08-OCT-20 | R5250865 |
| Titanium (Ti)-Total | <0.00030 | | 0.00030 | mg/L | | 08-OCT-20 | R5250865 |
| Tungsten (W)-Total | <0.00010 | | 0.00010 | mg/L | | 08-OCT-20 | R5250865 |
| Uranium (U)-Total | 0.000066 | | 0.000010 | mg/L | | 08-OCT-20 | R5250865 |
| Vanadium (V)-Total | <0.00050 | | 0.00050 | mg/L | | 08-OCT-20 | R5250865 |
| Zinc (Zn)-Total | 0.0196 | | 0.0030 | mg/L | | 08-OCT-20 | R5250865 |
| Zirconium (Zr)-Total | <0.00020 | | 0.00020 | mg/L | | 08-OCT-20 | R5250865 |
| Dissolved Nitrogen | | | | | | | |
| DKN (as N) by Fluorescence | | | | | | | |
| Dissolved Kjeldahl Nitrogen | 0.275 | | 0.050 | mg/L | 07-OCT-20 | 08-OCT-20 | R5252182 |
| Nitrate in Water by IC (Low Level) | | | | | | | |
| Nitrate (as N) | 0.0238 | | 0.0050 | mg/L | | 01-OCT-20 | R5244590 |
| Nitrite in Water by IC (Low Level) | | | | | | | |
| Nitrite (as N) | 0.0119 | | 0.0010 | mg/L | | 01-OCT-20 | R5244590 |
| Total Dissolved Nitrogen (Calculation) | | | | | | | |
| Total Dissolved Nitrogen | 0.310 | | 0.050 | mg/L | | 09-OCT-20 | |
| NO2, NO3, & (NO2+NO3) in Water | | | | | | | |
| Nitrate in Water by IC | | | | | | | |
| Nitrate (as N) | 0.024 | | 0.020 | mg/L | | 01-OCT-20 | R5244590 |
| Nitrate+Nitrite | | | | | | | |
| Nitrate and Nitrite (as N) | 0.0357 | | 0.0051 | mg/L | | 03-OCT-20 | |
| Nitrite in Water by IC | | | | | | | |
| Nitrite (as N) | 0.012 | | 0.010 | mg/L | | 01-OCT-20 | R5244590 |
| L2509465-2 HYPO BACKWASH | | | | | | | |
| Sampled By: CLIENT on 20-SEP-20 @ 12:00 | | | | | | | |
| Matrix: GRAB | | | | | | | |
| Miscellaneous Parameters | | | | | | | |
| Biochemical Oxygen Demand | <2.0 | | 2.0 | mg/L | | 01-OCT-20 | R5248896 |
| Bromide (Br) | <0.050 | | 0.050 | mg/L | | 01-OCT-20 | R5244590 |
| Chloride (Cl) | 7.54 | | 0.50 | mg/L | | 01-OCT-20 | R5244590 |
| Dissolved Kjeldahl Nitrogen | 0.41 | | 0.20 | mg/L | 08-OCT-20 | 08-OCT-20 | R5252182 |
| Dissolved Organic Carbon | 4.1 | | 1.0 | mg/L | | 07-OCT-20 | R5251520 |
| Fluoride (F) | <0.020 | | 0.020 | mg/L | | 01-OCT-20 | R5244590 |
| Hardness (as CaCO3) | 245 | HTC | 0.13 | mg/L | | 08-OCT-20 | |
| Phosphorus (P)-Total Dissolved | <0.020 | | 0.020 | mg/L | 05-OCT-20 | 06-OCT-20 | R5248641 |
| Total Dissolved Solids | 289 | DLDS | 20 | mg/L | | 03-OCT-20 | R5244764 |
| Mercury (Hg)-Total | <0.0000050 | | 0.0000050 | mg/L | | 02-OCT-20 | R5244251 |
| Total Organic Carbon | 5.0 | | 1.0 | mg/L | | 07-OCT-20 | R5251520 |
| Phosphorus (P)-Total | 0.030 | | 0.020 | mg/L | 05-OCT-20 | 06-OCT-20 | R5248641 |
| Total Suspended Solids | <3.0 | | 3.0 | mg/L | | 02-OCT-20 | R5244159 |
| Turbidity | 0.60 | | 0.10 | NTU | | 02-OCT-20 | R5244321 |
| pH, Conductivity and Total Alkalinity | | | | | | | |
| pH | 8.26 | | 0.10 | pH | | 01-OCT-20 | R5243520 |
| Conductivity (EC) | 454 | | 2.0 | uS/cm | | 01-OCT-20 | R5243520 |
| Bicarbonate (HCO3) | 166 | | 5.0 | mg/L | | 01-OCT-20 | R5243520 |
| Carbonate (CO3) | <5.0 | | 5.0 | mg/L | | 01-OCT-20 | R5243520 |
| Hydroxide (OH) | <5.0 | | 5.0 | mg/L | | 01-OCT-20 | R5243520 |

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| Sample Details/Parameters | Result | Qualifier* | D.L. | Units | Extracted | Analyzed | Batch |
|---|-----------|------------|----------|-------|-----------|-----------|----------|
| L2509465-2 HYPO BACKWASH | | | | | | | |
| Sampled By: CLIENT on 20-SEP-20 @ 12:00 | | | | | | | |
| Matrix: GRAB | | | | | | | |
| pH, Conductivity and Total Alkalinity | | | | | | | |
| Alkalinity, Total (as CaCO3) | 136 | | 2.0 | mg/L | | 01-OCT-20 | R5243520 |
| Total Metals in Water by CRC ICPMS | | | | | | | |
| Aluminum (Al)-Total | 0.0875 | | 0.0030 | mg/L | | 08-OCT-20 | R5250865 |
| Antimony (Sb)-Total | 0.00011 | | 0.00010 | mg/L | | 08-OCT-20 | R5250865 |
| Arsenic (As)-Total | 0.00033 | | 0.00010 | mg/L | | 08-OCT-20 | R5250865 |
| Barium (Ba)-Total | 0.0571 | | 0.00010 | mg/L | | 08-OCT-20 | R5250865 |
| Beryllium (Be)-Total | <0.00010 | | 0.00010 | mg/L | | 08-OCT-20 | R5250865 |
| Bismuth (Bi)-Total | <0.000050 | | 0.000050 | mg/L | | 08-OCT-20 | R5250865 |
| Boron (B)-Total | 0.021 | | 0.010 | mg/L | | 08-OCT-20 | R5250865 |
| Cadmium (Cd)-Total | 0.0000312 | | 0.000050 | mg/L | | 08-OCT-20 | R5250865 |
| Calcium (Ca)-Total | 51.8 | | 0.050 | mg/L | | 08-OCT-20 | R5250865 |
| Cesium (Cs)-Total | 0.000027 | | 0.000010 | mg/L | | 08-OCT-20 | R5250865 |
| Chromium (Cr)-Total | 0.00028 | | 0.00010 | mg/L | | 08-OCT-20 | R5250865 |
| Cobalt (Co)-Total | <0.00010 | | 0.00010 | mg/L | | 08-OCT-20 | R5250865 |
| Copper (Cu)-Total | 0.00976 | | 0.00050 | mg/L | | 08-OCT-20 | R5250865 |
| Iron (Fe)-Total | 0.036 | | 0.010 | mg/L | | 08-OCT-20 | R5250865 |
| Lead (Pb)-Total | 0.00851 | | 0.000050 | mg/L | | 08-OCT-20 | R5250865 |
| Lithium (Li)-Total | 0.0032 | | 0.0010 | mg/L | | 08-OCT-20 | R5250865 |
| Magnesium (Mg)-Total | 28.1 | | 0.0050 | mg/L | | 08-OCT-20 | R5250865 |
| Manganese (Mn)-Total | 0.0284 | | 0.00010 | mg/L | | 08-OCT-20 | R5250865 |
| Molybdenum (Mo)-Total | 0.000114 | | 0.000050 | mg/L | | 08-OCT-20 | R5250865 |
| Nickel (Ni)-Total | 0.00142 | | 0.00050 | mg/L | | 08-OCT-20 | R5250865 |
| Phosphorus (P)-Total | <0.050 | | 0.050 | mg/L | | 08-OCT-20 | R5250865 |
| Potassium (K)-Total | 0.906 | | 0.050 | mg/L | | 08-OCT-20 | R5250865 |
| Rubidium (Rb)-Total | 0.00050 | | 0.00020 | mg/L | | 08-OCT-20 | R5250865 |
| Selenium (Se)-Total | <0.000050 | | 0.000050 | mg/L | | 08-OCT-20 | R5250865 |
| Silicon (Si)-Total | 1.07 | | 0.10 | mg/L | | 08-OCT-20 | R5250865 |
| Silver (Ag)-Total | <0.000010 | | 0.000010 | mg/L | | 08-OCT-20 | R5250865 |
| Sodium (Na)-Total | 5.05 | | 0.050 | mg/L | | 08-OCT-20 | R5250865 |
| Strontium (Sr)-Total | 0.0552 | | 0.00020 | mg/L | | 08-OCT-20 | R5250865 |
| Sulfur (S)-Total | 36.7 | | 0.50 | mg/L | | 08-OCT-20 | R5250865 |
| Tellurium (Te)-Total | <0.00020 | | 0.00020 | mg/L | | 08-OCT-20 | R5250865 |
| Thallium (Tl)-Total | <0.000010 | | 0.000010 | mg/L | | 08-OCT-20 | R5250865 |
| Thorium (Th)-Total | <0.00010 | | 0.00010 | mg/L | | 08-OCT-20 | R5250865 |
| Tin (Sn)-Total | 0.00065 | | 0.00010 | mg/L | | 08-OCT-20 | R5250865 |
| Titanium (Ti)-Total | <0.00030 | | 0.00030 | mg/L | | 08-OCT-20 | R5250865 |
| Tungsten (W)-Total | <0.00010 | | 0.00010 | mg/L | | 08-OCT-20 | R5250865 |
| Uranium (U)-Total | 0.000071 | | 0.000010 | mg/L | | 08-OCT-20 | R5250865 |
| Vanadium (V)-Total | <0.00050 | | 0.00050 | mg/L | | 08-OCT-20 | R5250865 |
| Zinc (Zn)-Total | 0.0131 | | 0.0030 | mg/L | | 08-OCT-20 | R5250865 |
| Zirconium (Zr)-Total | <0.00020 | | 0.00020 | mg/L | | 08-OCT-20 | R5250865 |
| Dissolved Nitrogen | | | | | | | |
| DKN (as N) by Fluorescence | | | | | | | |
| Dissolved Kjeldahl Nitrogen | 0.407 | | 0.050 | mg/L | 07-OCT-20 | 08-OCT-20 | R5252182 |
| Nitrate in Water by IC (Low Level) | | | | | | | |
| Nitrate (as N) | 0.0161 | | 0.0050 | mg/L | | 01-OCT-20 | R5244590 |
| Nitrite in Water by IC (Low Level) | | | | | | | |
| Nitrite (as N) | 0.0034 | | 0.0010 | mg/L | | 01-OCT-20 | R5244590 |
| Total Dissolved Nitrogen (Calculation) | | | | | | | |
| Total Dissolved Nitrogen | 0.427 | | 0.050 | mg/L | | 09-OCT-20 | |
| NO2, NO3, & (NO2+NO3) in Water | | | | | | | |
| Nitrate in Water by IC | | | | | | | |

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

ALS ENVIRONMENTAL ANALYTICAL REPORT

| Sample Details/Parameters | Result | Qualifier* | D.L. | Units | Extracted | Analyzed | Batch |
|---|--------|------------|--------|-------|-----------|-----------|----------|
| L2509465-2 HYPO BACKWASH Sampled By: CLIENT on 20-SEP-20 @ 12:00 Matrix: GRAB | | | | | | | |
| Nitrate in Water by IC Nitrate (as N) | <0.020 | | 0.020 | mg/L | | 01-OCT-20 | R5244590 |
| Nitrate+Nitrite Nitrate and Nitrite (as N) | 0.0195 | | 0.0051 | mg/L | | 03-OCT-20 | |
| Nitrite in Water by IC Nitrite (as N) | <0.010 | | 0.010 | mg/L | | 01-OCT-20 | R5244590 |
| | | | | | | | |

* Refer to Referenced Information for Qualifiers (if any) and Methodology.

Reference Information

Qualifiers for Sample Submission Listed:

| Qualifier | Description |
|-----------|---|
| SFPL | DKN - Sample was Filtered and Preserved at the laboratory |

Sample Parameter Qualifier Key:

| Qualifier | Description |
|-----------|--|
| DLDS | Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity. |
| HTC | Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable). |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |

Test Method References:

| ALS Test Code | Matrix | Test Description | Method Reference** |
|---|--------|--|---|
| BOD-ED | Water | Biochemical Oxygen Demand (BOD) | APHA 5210 B-5 day Incub.-O2 electrode |
| Samples are diluted and seeded and then incubated in airtight bottles at 20°C for 5 days. Dissolved oxygen is measured initially and after incubation, and results are computed from the difference between initial and final DO. | | | |
| BR-L-IC-N-ED | Water | Bromide in Water by IC (Low Level) | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| C-DIS-ORG-CL | Water | Dissolved Organic Carbon | APHA 5310 B-Instrumental |
| Filtered (0.45 um) sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO2 which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer. | | | |
| C-TOT-ORG-CL | Water | Total Organic Carbon | APHA 5310 B-Instrumental |
| Sample is acidified and purged to remove inorganic carbon, then injected into a heated reaction chamber where organic carbon is oxidized to CO2 which is then transported in the carrier gas stream and measured via a non-dispersive infrared analyzer. | | | |
| CL-IC-N-ED | Water | Chloride in Water by IC | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| DKN-F-ED | Water | DKN (as N) by Fluorescence | J. Environ. Monit. (2005) 7:37-42. |
| This analysis is carried out using procedures adapted from APHA Method 4500-Norg D. "Block Digestion and Flow Injection Analysis". Dissolved Kjeldahl Nitrogen is determined using block digestion followed by Flow-injection analysis with fluorescence detection. | | | |
| DKN-L-F-ED | Water | DKN (as N) by Fluorescence | J. ENVIRON. MONIT., 2005, 7, 37-42, RSC |
| This analysis is carried out using procedures adapted from APHA Method 4500-Norg D. "Block Digestion and Flow Injection Analysis". Dissolved Kjeldahl Nitrogen is determined using block digestion followed by Flow-injection analysis with fluorescence detection. | | | |
| ETL-HARDNESS-TOT-ED | Water | Hardness (from Total Ca and Mg) | APHA 2340 B-Calculation |
| F-IC-N-ED | Water | Fluoride in Water by IC | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| HG-T-CVAA-ED | Water | Total Mercury in Water by CVAAS | EPA 1631E (mod) |
| Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS. | | | |
| MET-T-CCMS-ED | Water | Total Metals in Water by CRC ICPMS | EPA 200.2/6020A (mod) |
| Water samples are digested with nitric and hydrochloric acids, and analyzed by CRC ICPMS. | | | |
| Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method. | | | |
| N-TD-CALC-ED | Water | Total Dissolved Nitrogen (Calculation) | APHA 4500 N-Calculated |
| Total Dissolved Nitrogen is a calculated parameter. Total Dissolved Nitrogen = Dissolved Kjeldahl Nitrogen + [Nitrate and Nitrite (as N)]. | | | |
| NO2+NO3-CALC-ED | Water | Nitrate+Nitrite | CALCULATION |
| NO2-IC-N-ED | Water | Nitrite in Water by IC | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| NO2-L-IC-N-ED | Water | Nitrite in Water by IC (Low Level) | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| NO3-IC-N-ED | Water | Nitrate in Water by IC | EPA 300.1 (mod) |

Reference Information

Test Method References:

| ALS Test Code | Matrix | Test Description | Method Reference** |
|--|--------|---------------------------------------|--------------------------|
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| NO3-L-IC-N-ED | Water | Nitrate in Water by IC (Low Level) | EPA 300.1 (mod) |
| Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection. | | | |
| P-T-COL-ED | Water | Total P in Water by Colour | APHA 4500-P PHOSPHORUS |
| This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Phosphorus is determined colourimetrically after persulphate digestion of the sample. | | | |
| P-TD-COL-ED | Water | Total Dissolved P in Water by Colour | APHA 4500-P PHOSPHORUS |
| This analysis is carried out using procedures adapted from APHA Method 4500-P "Phosphorus". Total Dissolved Phosphorus is determined colourimetrically after persulphate digestion of a sample that has been lab or field filtered through a 0.45 micron membrane filter. | | | |
| PH/EC/ALK-ED | Water | pH, Conductivity and Total Alkalinity | APHA 4500-H, 2510, 2320 |
| All samples analyzed by this method for pH will have exceeded the 15 minute recommended hold time from time of sampling (field analysis is recommended for pH where highly accurate results are needed). pH measurement is determined from the activity of the hydrogen ions using a hydrogen electrode and a reference electrode. Alkalinity measurement is based on the sample's capacity to neutralize acid. Auto-titration to pH 4.5 using 0.02N H2SO4 is performed. Conductivity measurement is based on the sample's capacity to convey an electric current, and is measured with a conductivity meter. | | | |
| SOLIDS-TDS-ED | Water | Total Dissolved Solids | APHA 2540 C |
| Gravimetric determination of solids in waters by filtration and evaporating filtrate to dryness at 180 degrees Celsius. | | | |
| SOLIDS-TOTSUS-ED | Water | Total Suspended Solids | APHA 2540 D-Gravimetric |
| Gravimetric determination of solids in waters by filtration and drying filter at 104 degrees Celsius. | | | |
| TURBIDITY-ED | Water | Turbidity | APHA 2130 B-Nephelometer |
| This analysis is carried out using procedures adapted from APHA Method 2130 "Turbidity". Turbidity is determined by the nephelometric method. | | | |

** ALS test methods may incorporate modifications from specified reference methods to improve performance.

The last two letters of the above test code(s) indicate the laboratory that performed analytical analysis for that test. Refer to the list below:

| Laboratory Definition Code | Laboratory Location |
|----------------------------|---|
| ED | ALS ENVIRONMENTAL - EDMONTON, ALBERTA, CANADA |
| CL | ALS ENVIRONMENTAL - CALGARY, ALBERTA, CANADA |

Chain of Custody Numbers:

17-818295

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.



Quality Control Report

Workorder: L2509465

Report Date: 13-OCT-20

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Client: Cash Clients
 90875 198st
 Langley BC V1M 3B1
 Contact: Jainish Patel

| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|---------------------------|-----------------|-------------------|--------|-----------|-------|-----|--------|-----------|
| BOD-ED | | | | | | | | |
| | Water | | | | | | | |
| Batch | R5248896 | | | | | | | |
| WG3416282-2 | LCS | | | | | | | |
| Biochemical Oxygen Demand | | | 100.8 | | % | | 85-115 | 01-OCT-20 |
| WG3416282-3 | MB | | | | | | | |
| Biochemical Oxygen Demand | | | <2.0 | | mg/L | | 2 | 01-OCT-20 |
| BR-L-IC-N-ED | | | | | | | | |
| | Water | | | | | | | |
| Batch | R5244590 | | | | | | | |
| WG3416630-3 | DUP | L2509465-2 | | | | | | |
| Bromide (Br) | | <0.050 | <0.050 | RPD-NA | mg/L | N/A | 20 | 01-OCT-20 |
| WG3416630-11 | LCS | | | | | | | |
| Bromide (Br) | | | 101.3 | | % | | 85-115 | 01-OCT-20 |
| WG3416630-13 | LCS | | | | | | | |
| Bromide (Br) | | | 102.1 | | % | | 85-115 | 01-OCT-20 |
| WG3416630-15 | LCS | | | | | | | |
| Bromide (Br) | | | 106.4 | | % | | 85-115 | 01-OCT-20 |
| WG3416630-2 | LCS | | | | | | | |
| Bromide (Br) | | | 105.9 | | % | | 85-115 | 01-OCT-20 |
| WG3416630-9 | LCS | | | | | | | |
| Bromide (Br) | | | 105.2 | | % | | 85-115 | 01-OCT-20 |
| WG3416630-1 | MB | | | | | | | |
| Bromide (Br) | | | <0.050 | | mg/L | | 0.05 | 01-OCT-20 |
| WG3416630-10 | MB | | | | | | | |
| Bromide (Br) | | | <0.050 | | mg/L | | 0.05 | 01-OCT-20 |
| WG3416630-12 | MB | | | | | | | |
| Bromide (Br) | | | <0.050 | | mg/L | | 0.05 | 01-OCT-20 |
| WG3416630-14 | MB | | | | | | | |
| Bromide (Br) | | | <0.050 | | mg/L | | 0.05 | 01-OCT-20 |
| WG3416630-16 | MB | | | | | | | |
| Bromide (Br) | | | <0.050 | | mg/L | | 0.05 | 01-OCT-20 |
| WG3416630-4 | MS | L2509465-2 | | | | | | |
| Bromide (Br) | | | 103.8 | | % | | 75-125 | 01-OCT-20 |
| C-DIS-ORG-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R5251518 | | | | | | | |
| WG3421010-2 | LCS | | | | | | | |
| Dissolved Organic Carbon | | | 100.1 | | % | | 80-120 | 07-OCT-20 |
| WG3421010-1 | MB | | | | | | | |
| Dissolved Organic Carbon | | | <1.0 | | mg/L | | 1 | 07-OCT-20 |



Quality Control Report

Workorder: L2509465

Report Date: 13-OCT-20

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--------------------------|-----------------|-------------------|--------|-----------|-------|-----|--------|-----------|
| C-DIS-ORG-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R5251520 | | | | | | | |
| WG3421011-3 | DUP | L2509465-2 | | | | | | |
| Dissolved Organic Carbon | | 4.1 | 4.4 | | mg/L | 7.0 | 20 | 07-OCT-20 |
| WG3421011-2 | LCS | | | | | | | |
| Dissolved Organic Carbon | | | 106.2 | | % | | 80-120 | 07-OCT-20 |
| WG3421011-1 | MB | | | | | | | |
| Dissolved Organic Carbon | | | <1.0 | | mg/L | | 1 | 07-OCT-20 |
| WG3421011-4 | MS | L2509465-2 | | | | | | |
| Dissolved Organic Carbon | | | 105.9 | | % | | 70-130 | 07-OCT-20 |
| C-TOT-ORG-CL | | | | | | | | |
| | Water | | | | | | | |
| Batch | R5251518 | | | | | | | |
| WG3421010-2 | LCS | | | | | | | |
| Total Organic Carbon | | | 103.7 | | % | | 80-120 | 07-OCT-20 |
| WG3421010-1 | MB | | | | | | | |
| Total Organic Carbon | | | <1.0 | | mg/L | | 1 | 07-OCT-20 |
| Batch | R5251520 | | | | | | | |
| WG3421011-3 | DUP | L2509465-2 | | | | | | |
| Total Organic Carbon | | 5.0 | 5.0 | | mg/L | 0.4 | 20 | 07-OCT-20 |
| WG3421011-2 | LCS | | | | | | | |
| Total Organic Carbon | | | 110.3 | | % | | 80-120 | 07-OCT-20 |
| WG3421011-1 | MB | | | | | | | |
| Total Organic Carbon | | | <1.0 | | mg/L | | 1 | 07-OCT-20 |
| WG3421011-4 | MS | L2509465-2 | | | | | | |
| Total Organic Carbon | | | 128.1 | | % | | 70-130 | 07-OCT-20 |
| CL-IC-N-ED | | | | | | | | |
| | Water | | | | | | | |
| Batch | R5244590 | | | | | | | |
| WG3416630-3 | DUP | L2509465-2 | | | | | | |
| Chloride (Cl) | | 7.54 | 7.50 | | mg/L | 0.5 | 20 | 01-OCT-20 |
| WG3416630-11 | LCS | | | | | | | |
| Chloride (Cl) | | | 101.3 | | % | | 90-110 | 01-OCT-20 |
| WG3416630-13 | LCS | | | | | | | |
| Chloride (Cl) | | | 101.7 | | % | | 90-110 | 01-OCT-20 |
| WG3416630-15 | LCS | | | | | | | |
| Chloride (Cl) | | | 101.7 | | % | | 90-110 | 01-OCT-20 |
| WG3416630-2 | LCS | | | | | | | |
| Chloride (Cl) | | | 101.3 | | % | | 90-110 | 01-OCT-20 |
| WG3416630-9 | LCS | | | | | | | |
| Chloride (Cl) | | | 101.3 | | % | | 90-110 | 01-OCT-20 |
| WG3416630-1 | MB | | | | | | | |



Quality Control Report

Workorder: L2509465

Report Date: 13-OCT-20

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------------|-----------------|-------------------|--------|-----------|-------|-----|--------|-----------|
| CL-IC-N-ED | | | | | | | | |
| Water | | | | | | | | |
| Batch | R5244590 | | | | | | | |
| WG3416630-1 | MB | | | | | | | |
| Chloride (Cl) | | | <0.50 | | mg/L | | 0.5 | 01-OCT-20 |
| WG3416630-10 | MB | | | | | | | |
| Chloride (Cl) | | | <0.50 | | mg/L | | 0.5 | 01-OCT-20 |
| WG3416630-12 | MB | | | | | | | |
| Chloride (Cl) | | | <0.50 | | mg/L | | 0.5 | 01-OCT-20 |
| WG3416630-14 | MB | | | | | | | |
| Chloride (Cl) | | | <0.50 | | mg/L | | 0.5 | 01-OCT-20 |
| WG3416630-16 | MB | | | | | | | |
| Chloride (Cl) | | | <0.50 | | mg/L | | 0.5 | 01-OCT-20 |
| WG3416630-4 | MS | L2509465-2 | | | | | | |
| Chloride (Cl) | | | 101.1 | | % | | 75-125 | 01-OCT-20 |
| DKN-F-ED | | | | | | | | |
| Water | | | | | | | | |
| Batch | R5252182 | | | | | | | |
| WG3420510-2 | LCS | | | | | | | |
| Dissolved Kjeldahl Nitrogen | | | 101 | | % | | 75-125 | 08-OCT-20 |
| WG3420510-1 | MB | | | | | | | |
| Dissolved Kjeldahl Nitrogen | | | <0.20 | | mg/L | | 0.2 | 08-OCT-20 |
| DKN-L-F-ED | | | | | | | | |
| Water | | | | | | | | |
| Batch | R5252182 | | | | | | | |
| WG3420510-2 | LCS | | | | | | | |
| Dissolved Kjeldahl Nitrogen | | | 101 | | % | | 75-125 | 08-OCT-20 |
| WG3420510-1 | MB | | | | | | | |
| Dissolved Kjeldahl Nitrogen | | | <0.050 | | mg/L | | 0.05 | 08-OCT-20 |
| F-IC-N-ED | | | | | | | | |
| Water | | | | | | | | |
| Batch | R5244590 | | | | | | | |
| WG3416630-3 | DUP | L2509465-2 | | | | | | |
| Fluoride (F) | | <0.020 | <0.020 | RPD-NA | mg/L | N/A | 20 | 01-OCT-20 |
| WG3416630-11 | LCS | | | | | | | |
| Fluoride (F) | | | 100.5 | | % | | 90-110 | 01-OCT-20 |
| WG3416630-13 | LCS | | | | | | | |
| Fluoride (F) | | | 101.5 | | % | | 90-110 | 01-OCT-20 |
| WG3416630-15 | LCS | | | | | | | |
| Fluoride (F) | | | 103.9 | | % | | 90-110 | 01-OCT-20 |
| WG3416630-2 | LCS | | | | | | | |
| Fluoride (F) | | | 96.9 | | % | | 90-110 | 01-OCT-20 |
| WG3416630-9 | LCS | | | | | | | |
| Fluoride (F) | | | 97.5 | | % | | 90-110 | 01-OCT-20 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|----------------------|-----------------|-------------------|------------|-----------|-------|---------|----------|-----------|
| F-IC-N-ED | | | | | | | | |
| Water | | | | | | | | |
| Batch | R5244590 | | | | | | | |
| WG3416630-1 | MB | | | | | | | |
| Fluoride (F) | | | <0.020 | | mg/L | | 0.02 | 01-OCT-20 |
| WG3416630-10 | MB | | | | | | | |
| Fluoride (F) | | | <0.020 | | mg/L | | 0.02 | 01-OCT-20 |
| WG3416630-12 | MB | | | | | | | |
| Fluoride (F) | | | <0.020 | | mg/L | | 0.02 | 01-OCT-20 |
| WG3416630-14 | MB | | | | | | | |
| Fluoride (F) | | | <0.020 | | mg/L | | 0.02 | 01-OCT-20 |
| WG3416630-16 | MB | | | | | | | |
| Fluoride (F) | | | <0.020 | | mg/L | | 0.02 | 01-OCT-20 |
| WG3416630-4 | MS | L2509465-2 | | | | | | |
| Fluoride (F) | | | 104.3 | | % | | 75-125 | 01-OCT-20 |
| HG-T-CVAA-ED | | | | | | | | |
| Water | | | | | | | | |
| Batch | R5244251 | | | | | | | |
| WG3417155-3 | DUP | L2509465-1 | | | | | | |
| Mercury (Hg)-Total | | <0.0000050 | <0.0000050 | RPD-NA | mg/L | N/A | 20 | 02-OCT-20 |
| WG3417155-2 | LCS | | | | | | | |
| Mercury (Hg)-Total | | | 96.3 | | % | | 80-120 | 02-OCT-20 |
| WG3417155-1 | MB | | | | | | | |
| Mercury (Hg)-Total | | | <0.0000050 | | mg/L | | 0.000005 | 02-OCT-20 |
| WG3417155-4 | MS | L2509465-2 | | | | | | |
| Mercury (Hg)-Total | | | 94.1 | | % | | 70-130 | 02-OCT-20 |
| MET-T-CCMS-ED | | | | | | | | |
| Water | | | | | | | | |
| Batch | R5250865 | | | | | | | |
| WG3420433-3 | DUP | L2509465-1 | | | | | | |
| Aluminum (Al)-Total | | 0.0259 | 0.0253 | | mg/L | 2.1 | 20 | 08-OCT-20 |
| Antimony (Sb)-Total | | <0.00010 | <0.00010 | RPD-NA | mg/L | N/A | 20 | 08-OCT-20 |
| Arsenic (As)-Total | | 0.00030 | 0.00033 | | mg/L | 8.9 | 20 | 08-OCT-20 |
| Barium (Ba)-Total | | 0.0436 | 0.0437 | | mg/L | 0.2 | 20 | 08-OCT-20 |
| Beryllium (Be)-Total | | <0.00010 | <0.00010 | RPD-NA | mg/L | N/A | 20 | 08-OCT-20 |
| Bismuth (Bi)-Total | | <0.000050 | <0.000050 | RPD-NA | mg/L | N/A | 20 | 08-OCT-20 |
| Boron (B)-Total | | <0.010 | <0.010 | RPD-NA | mg/L | N/A | 20 | 08-OCT-20 |
| Calcium (Ca)-Total | | 51.8 | 52.6 | | mg/L | 1.6 | 20 | 08-OCT-20 |
| Cesium (Cs)-Total | | <0.000010 | <0.000010 | RPD-NA | mg/L | N/A | 20 | 08-OCT-20 |
| Chromium (Cr)-Total | | 0.00024 | 0.00019 | J | mg/L | 0.00005 | 0.0002 | 08-OCT-20 |
| Cobalt (Co)-Total | | <0.00010 | <0.00010 | RPD-NA | mg/L | N/A | 20 | 08-OCT-20 |
| Copper (Cu)-Total | | 0.00620 | 0.00601 | | mg/L | 3.1 | 20 | 08-OCT-20 |

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|-------------------|-----------|-----------|-------|-----|--------|-----------|
| MET-T-CCMS-ED | | | | | | | | |
| | Water | | | | | | | |
| Batch | R5250865 | | | | | | | |
| WG3420433-3 | DUP | L2509465-1 | | | | | | |
| Iron (Fe)-Total | | 0.037 | 0.034 | | mg/L | 6.8 | 20 | 08-OCT-20 |
| Lead (Pb)-Total | | 0.00217 | 0.00211 | | mg/L | 2.7 | 20 | 08-OCT-20 |
| Lithium (Li)-Total | | 0.0030 | 0.0031 | | mg/L | 2.8 | 20 | 08-OCT-20 |
| Magnesium (Mg)-Total | | 27.9 | 27.9 | | mg/L | 0.2 | 20 | 08-OCT-20 |
| Manganese (Mn)-Total | | 0.0183 | 0.0187 | | mg/L | 2.6 | 20 | 08-OCT-20 |
| Molybdenum (Mo)-Total | | 0.000089 | 0.000090 | | mg/L | 1.7 | 20 | 08-OCT-20 |
| Nickel (Ni)-Total | | 0.00143 | 0.00146 | | mg/L | 2.2 | 20 | 08-OCT-20 |
| Phosphorus (P)-Total | | <0.050 | <0.050 | RPD-NA | mg/L | N/A | 20 | 08-OCT-20 |
| Potassium (K)-Total | | 0.762 | 0.775 | | mg/L | 1.7 | 20 | 08-OCT-20 |
| Rubidium (Rb)-Total | | 0.00036 | 0.00036 | | mg/L | 1.0 | 20 | 08-OCT-20 |
| Selenium (Se)-Total | | <0.000050 | <0.000050 | RPD-NA | mg/L | N/A | 20 | 08-OCT-20 |
| Silicon (Si)-Total | | 1.07 | 1.07 | | mg/L | 0.7 | 20 | 08-OCT-20 |
| Silver (Ag)-Total | | <0.000010 | <0.000010 | RPD-NA | mg/L | N/A | 20 | 08-OCT-20 |
| Sodium (Na)-Total | | 4.22 | 4.25 | | mg/L | 0.9 | 20 | 08-OCT-20 |
| Strontium (Sr)-Total | | 0.0551 | 0.0556 | | mg/L | 0.9 | 20 | 08-OCT-20 |
| Sulfur (S)-Total | | 35.6 | 35.7 | | mg/L | 0.1 | 20 | 08-OCT-20 |
| Tellurium (Te)-Total | | <0.00020 | <0.00020 | RPD-NA | mg/L | N/A | 20 | 08-OCT-20 |
| Thallium (Tl)-Total | | <0.000010 | <0.000010 | RPD-NA | mg/L | N/A | 20 | 08-OCT-20 |
| Thorium (Th)-Total | | <0.00010 | <0.00010 | RPD-NA | mg/L | N/A | 20 | 08-OCT-20 |
| Tin (Sn)-Total | | 0.00072 | 0.00061 | | mg/L | 17 | 20 | 08-OCT-20 |
| Titanium (Ti)-Total | | <0.00030 | <0.00030 | RPD-NA | mg/L | N/A | 20 | 08-OCT-20 |
| Tungsten (W)-Total | | <0.00010 | <0.00010 | RPD-NA | mg/L | N/A | 20 | 08-OCT-20 |
| Uranium (U)-Total | | 0.000066 | 0.000063 | | mg/L | 4.8 | 20 | 08-OCT-20 |
| Vanadium (V)-Total | | <0.00050 | <0.00050 | RPD-NA | mg/L | N/A | 20 | 08-OCT-20 |
| Zinc (Zn)-Total | | 0.0196 | 0.0194 | | mg/L | 0.9 | 20 | 08-OCT-20 |
| Zirconium (Zr)-Total | | <0.00020 | <0.00020 | RPD-NA | mg/L | N/A | 20 | 08-OCT-20 |
| WG3420433-2 | LCS | | | | | | | |
| Aluminum (Al)-Total | | | 100.9 | | % | | 70-130 | 08-OCT-20 |
| Antimony (Sb)-Total | | | 101.5 | | % | | 70-130 | 08-OCT-20 |
| Arsenic (As)-Total | | | 98.5 | | % | | 70-130 | 08-OCT-20 |
| Barium (Ba)-Total | | | 102.4 | | % | | 70-130 | 08-OCT-20 |
| Beryllium (Be)-Total | | | 97.1 | | % | | 70-130 | 08-OCT-20 |
| Bismuth (Bi)-Total | | | 101.0 | | % | | 70-130 | 08-OCT-20 |
| Boron (B)-Total | | | 92.1 | | % | | 70-130 | 08-OCT-20 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|-----------|---------|-----------|-------|-----|--------|-----------|
| MET-T-CCMS-ED | | | | | | | | |
| | Water | | | | | | | |
| Batch | R5250865 | | | | | | | |
| WG3420433-2 | LCS | | | | | | | |
| Cadmium (Cd)-Total | | | 101.9 | | % | | 70-130 | 08-OCT-20 |
| Calcium (Ca)-Total | | | 100.6 | | % | | 70-130 | 08-OCT-20 |
| Cesium (Cs)-Total | | | 101.1 | | % | | 70-130 | 08-OCT-20 |
| Chromium (Cr)-Total | | | 100.8 | | % | | 70-130 | 08-OCT-20 |
| Cobalt (Co)-Total | | | 101.1 | | % | | 70-130 | 08-OCT-20 |
| Copper (Cu)-Total | | | 98.1 | | % | | 70-130 | 08-OCT-20 |
| Iron (Fe)-Total | | | 101.0 | | % | | 70-130 | 08-OCT-20 |
| Lead (Pb)-Total | | | 100.9 | | % | | 70-130 | 08-OCT-20 |
| Lithium (Li)-Total | | | 97.9 | | % | | 70-130 | 08-OCT-20 |
| Magnesium (Mg)-Total | | | 103.6 | | % | | 70-130 | 08-OCT-20 |
| Manganese (Mn)-Total | | | 100.4 | | % | | 70-130 | 08-OCT-20 |
| Molybdenum (Mo)-Total | | | 100.8 | | % | | 70-130 | 08-OCT-20 |
| Nickel (Ni)-Total | | | 100.5 | | % | | 70-130 | 08-OCT-20 |
| Phosphorus (P)-Total | | | 104.0 | | % | | 70-130 | 08-OCT-20 |
| Potassium (K)-Total | | | 103.7 | | % | | 70-130 | 08-OCT-20 |
| Rubidium (Rb)-Total | | | 97.1 | | % | | 70-130 | 08-OCT-20 |
| Selenium (Se)-Total | | | 99.5 | | % | | 70-130 | 08-OCT-20 |
| Silicon (Si)-Total | | | 109.7 | | % | | 70-130 | 08-OCT-20 |
| Silver (Ag)-Total | | | 99.2 | | % | | 70-130 | 08-OCT-20 |
| Sodium (Na)-Total | | | 99.0 | | % | | 70-130 | 08-OCT-20 |
| Strontium (Sr)-Total | | | 100.4 | | % | | 70-130 | 08-OCT-20 |
| Sulfur (S)-Total | | | 92.1 | | % | | 70-130 | 08-OCT-20 |
| Tellurium (Te)-Total | | | 99.4 | | % | | 70-130 | 08-OCT-20 |
| Thallium (Tl)-Total | | | 102.0 | | % | | 70-130 | 08-OCT-20 |
| Thorium (Th)-Total | | | 100.5 | | % | | 70-130 | 08-OCT-20 |
| Tin (Sn)-Total | | | 101.1 | | % | | 70-130 | 08-OCT-20 |
| Titanium (Ti)-Total | | | 100.5 | | % | | 70-130 | 08-OCT-20 |
| Tungsten (W)-Total | | | 106.2 | | % | | 70-130 | 08-OCT-20 |
| Uranium (U)-Total | | | 101.6 | | % | | 70-130 | 08-OCT-20 |
| Vanadium (V)-Total | | | 101.9 | | % | | 70-130 | 08-OCT-20 |
| Zinc (Zn)-Total | | | 95.1 | | % | | 70-130 | 08-OCT-20 |
| Zirconium (Zr)-Total | | | 98.8 | | % | | 70-130 | 08-OCT-20 |
| WG3420433-1 | MB | | | | | | | |
| Aluminum (Al)-Total | | | <0.0030 | | mg/L | | 0.003 | 08-OCT-20 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|-----------|------------|-----------|-------|-----|----------|-----------|
| MET-T-CCMS-ED | | | | | | | | |
| | Water | | | | | | | |
| Batch | R5250865 | | | | | | | |
| WG3420433-1 | MB | | | | | | | |
| Antimony (Sb)-Total | | | <0.00010 | | mg/L | | 0.0001 | 08-OCT-20 |
| Arsenic (As)-Total | | | <0.00010 | | mg/L | | 0.0001 | 08-OCT-20 |
| Barium (Ba)-Total | | | <0.00010 | | mg/L | | 0.0001 | 08-OCT-20 |
| Beryllium (Be)-Total | | | <0.00010 | | mg/L | | 0.0001 | 08-OCT-20 |
| Bismuth (Bi)-Total | | | <0.000050 | | mg/L | | 0.00005 | 08-OCT-20 |
| Boron (B)-Total | | | <0.010 | | mg/L | | 0.01 | 08-OCT-20 |
| Cadmium (Cd)-Total | | | <0.0000050 | | mg/L | | 0.000005 | 08-OCT-20 |
| Calcium (Ca)-Total | | | <0.050 | | mg/L | | 0.05 | 08-OCT-20 |
| Cesium (Cs)-Total | | | <0.000010 | | mg/L | | 0.00001 | 08-OCT-20 |
| Chromium (Cr)-Total | | | <0.00010 | | mg/L | | 0.0001 | 08-OCT-20 |
| Cobalt (Co)-Total | | | <0.00010 | | mg/L | | 0.0001 | 08-OCT-20 |
| Copper (Cu)-Total | | | <0.00050 | | mg/L | | 0.0005 | 08-OCT-20 |
| Iron (Fe)-Total | | | <0.010 | | mg/L | | 0.01 | 08-OCT-20 |
| Lead (Pb)-Total | | | <0.000050 | | mg/L | | 0.00005 | 08-OCT-20 |
| Lithium (Li)-Total | | | <0.0010 | | mg/L | | 0.001 | 08-OCT-20 |
| Magnesium (Mg)-Total | | | <0.0050 | | mg/L | | 0.005 | 08-OCT-20 |
| Manganese (Mn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 08-OCT-20 |
| Molybdenum (Mo)-Total | | | <0.000050 | | mg/L | | 0.00005 | 08-OCT-20 |
| Nickel (Ni)-Total | | | <0.00050 | | mg/L | | 0.0005 | 08-OCT-20 |
| Phosphorus (P)-Total | | | <0.050 | | mg/L | | 0.05 | 08-OCT-20 |
| Potassium (K)-Total | | | <0.050 | | mg/L | | 0.05 | 08-OCT-20 |
| Rubidium (Rb)-Total | | | <0.00020 | | mg/L | | 0.0002 | 08-OCT-20 |
| Selenium (Se)-Total | | | <0.000050 | | mg/L | | 0.00005 | 08-OCT-20 |
| Silicon (Si)-Total | | | <0.10 | | mg/L | | 0.1 | 08-OCT-20 |
| Silver (Ag)-Total | | | <0.000010 | | mg/L | | 0.00001 | 08-OCT-20 |
| Sodium (Na)-Total | | | <0.050 | | mg/L | | 0.05 | 08-OCT-20 |
| Strontium (Sr)-Total | | | <0.00020 | | mg/L | | 0.0002 | 08-OCT-20 |
| Sulfur (S)-Total | | | <0.50 | | mg/L | | 0.5 | 08-OCT-20 |
| Tellurium (Te)-Total | | | <0.00020 | | mg/L | | 0.0002 | 08-OCT-20 |
| Thallium (Tl)-Total | | | <0.000010 | | mg/L | | 0.00001 | 08-OCT-20 |
| Thorium (Th)-Total | | | <0.00010 | | mg/L | | 0.0001 | 08-OCT-20 |
| Tin (Sn)-Total | | | <0.00010 | | mg/L | | 0.0001 | 08-OCT-20 |
| Titanium (Ti)-Total | | | <0.00030 | | mg/L | | 0.0003 | 08-OCT-20 |
| Tungsten (W)-Total | | | <0.00010 | | mg/L | | 0.0001 | 08-OCT-20 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-----------------------|-----------------|-------------------|-----------|-----------|-------|-----|---------|-----------|
| MET-T-CCMS-ED | | | | | | | | |
| | Water | | | | | | | |
| Batch | R5250865 | | | | | | | |
| WG3420433-1 MB | | | | | | | | |
| Uranium (U)-Total | | | <0.000010 | | mg/L | | 0.00001 | 08-OCT-20 |
| Vanadium (V)-Total | | | <0.00050 | | mg/L | | 0.0005 | 08-OCT-20 |
| Zinc (Zn)-Total | | | <0.0030 | | mg/L | | 0.003 | 08-OCT-20 |
| Zirconium (Zr)-Total | | | <0.00020 | | mg/L | | 0.0002 | 08-OCT-20 |
| WG3420433-4 MS | | L2509465-2 | | | | | | |
| Aluminum (Al)-Total | | | 92.8 | | % | | 70-130 | 08-OCT-20 |
| Antimony (Sb)-Total | | | 99.1 | | % | | 70-130 | 08-OCT-20 |
| Arsenic (As)-Total | | | 97.9 | | % | | 70-130 | 08-OCT-20 |
| Barium (Ba)-Total | | | N/A | MS-B | % | | - | 08-OCT-20 |
| Beryllium (Be)-Total | | | 93.5 | | % | | 70-130 | 08-OCT-20 |
| Bismuth (Bi)-Total | | | 83.5 | | % | | 70-130 | 08-OCT-20 |
| Boron (B)-Total | | | 90.3 | | % | | 70-130 | 08-OCT-20 |
| Cadmium (Cd)-Total | | | 99.8 | | % | | 70-130 | 08-OCT-20 |
| Calcium (Ca)-Total | | | N/A | MS-B | % | | - | 08-OCT-20 |
| Cesium (Cs)-Total | | | 99.1 | | % | | 70-130 | 08-OCT-20 |
| Chromium (Cr)-Total | | | 98.2 | | % | | 70-130 | 08-OCT-20 |
| Cobalt (Co)-Total | | | 95.0 | | % | | 70-130 | 08-OCT-20 |
| Copper (Cu)-Total | | | 90.3 | | % | | 70-130 | 08-OCT-20 |
| Iron (Fe)-Total | | | 92.9 | | % | | 70-130 | 08-OCT-20 |
| Lead (Pb)-Total | | | 93.9 | | % | | 70-130 | 08-OCT-20 |
| Lithium (Li)-Total | | | 88.3 | | % | | 70-130 | 08-OCT-20 |
| Magnesium (Mg)-Total | | | N/A | MS-B | % | | - | 08-OCT-20 |
| Manganese (Mn)-Total | | | N/A | MS-B | % | | - | 08-OCT-20 |
| Molybdenum (Mo)-Total | | | 96.0 | | % | | 70-130 | 08-OCT-20 |
| Nickel (Ni)-Total | | | 96.2 | | % | | 70-130 | 08-OCT-20 |
| Phosphorus (P)-Total | | | 96.9 | | % | | 70-130 | 08-OCT-20 |
| Potassium (K)-Total | | | 97.1 | | % | | 70-130 | 08-OCT-20 |
| Rubidium (Rb)-Total | | | 91.1 | | % | | 70-130 | 08-OCT-20 |
| Selenium (Se)-Total | | | 99.7 | | % | | 70-130 | 08-OCT-20 |
| Silicon (Si)-Total | | | 91.4 | | % | | 70-130 | 08-OCT-20 |
| Silver (Ag)-Total | | | 95.9 | | % | | 70-130 | 08-OCT-20 |
| Sodium (Na)-Total | | | N/A | MS-B | % | | - | 08-OCT-20 |
| Strontium (Sr)-Total | | | N/A | MS-B | % | | - | 08-OCT-20 |
| Sulfur (S)-Total | | | N/A | MS-B | % | | - | 08-OCT-20 |



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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|----------------------|-----------------|-------------------|---------|-----------|-------|-----|--------|-----------|
| NO2-IC-N-ED | | | | | | | | |
| Water | | | | | | | | |
| Batch | R5244590 | | | | | | | |
| WG3416630-16 | MB | | | | | | | |
| Nitrite (as N) | | | <0.010 | | mg/L | | 0.01 | 01-OCT-20 |
| WG3416630-4 | MS | L2509465-2 | | | | | | |
| Nitrite (as N) | | | 107.9 | | % | | 75-125 | 01-OCT-20 |
| NO2-L-IC-N-ED | | | | | | | | |
| Water | | | | | | | | |
| Batch | R5244590 | | | | | | | |
| WG3416630-3 | DUP | L2509465-2 | | | | | | |
| Nitrite (as N) | | 0.0034 | 0.0037 | | mg/L | 9.6 | 20 | 01-OCT-20 |
| WG3416630-11 | LCS | | | | | | | |
| Nitrite (as N) | | | 104.3 | | % | | 90-110 | 01-OCT-20 |
| WG3416630-13 | LCS | | | | | | | |
| Nitrite (as N) | | | 104.5 | | % | | 90-110 | 01-OCT-20 |
| WG3416630-15 | LCS | | | | | | | |
| Nitrite (as N) | | | 104.6 | | % | | 90-110 | 01-OCT-20 |
| WG3416630-2 | LCS | | | | | | | |
| Nitrite (as N) | | | 103.4 | | % | | 90-110 | 01-OCT-20 |
| WG3416630-9 | LCS | | | | | | | |
| Nitrite (as N) | | | 105.3 | | % | | 90-110 | 01-OCT-20 |
| WG3416630-1 | MB | | | | | | | |
| Nitrite (as N) | | | <0.0010 | | mg/L | | 0.001 | 01-OCT-20 |
| WG3416630-10 | MB | | | | | | | |
| Nitrite (as N) | | | <0.0010 | | mg/L | | 0.001 | 01-OCT-20 |
| WG3416630-12 | MB | | | | | | | |
| Nitrite (as N) | | | <0.0010 | | mg/L | | 0.001 | 01-OCT-20 |
| WG3416630-14 | MB | | | | | | | |
| Nitrite (as N) | | | <0.0010 | | mg/L | | 0.001 | 01-OCT-20 |
| WG3416630-16 | MB | | | | | | | |
| Nitrite (as N) | | | <0.0010 | | mg/L | | 0.001 | 01-OCT-20 |
| WG3416630-4 | MS | L2509465-2 | | | | | | |
| Nitrite (as N) | | | 107.9 | | % | | 75-125 | 01-OCT-20 |
| NO3-IC-N-ED | | | | | | | | |
| Water | | | | | | | | |
| Batch | R5244590 | | | | | | | |
| WG3416630-3 | DUP | L2509465-2 | | | | | | |
| Nitrate (as N) | | <0.020 | <0.020 | RPD-NA | mg/L | N/A | 20 | 01-OCT-20 |
| WG3416630-11 | LCS | | | | | | | |
| Nitrate (as N) | | | 101.1 | | % | | 90-110 | 01-OCT-20 |
| WG3416630-13 | LCS | | | | | | | |
| Nitrate (as N) | | | 101.4 | | % | | 90-110 | 01-OCT-20 |

Quality Control Report

Workorder: L2509465

Report Date: 13-OCT-20

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|----------------------|-----------------|-------------------|---------|-----------|-------|-----|--------|-----------|
| NO3-IC-N-ED | | | | | | | | |
| | Water | | | | | | | |
| Batch | R5244590 | | | | | | | |
| WG3416630-15 | LCS | | | | | | | |
| Nitrate (as N) | | | 102.7 | | % | | 90-110 | 01-OCT-20 |
| WG3416630-2 | LCS | | | | | | | |
| Nitrate (as N) | | | 100.9 | | % | | 90-110 | 01-OCT-20 |
| WG3416630-9 | LCS | | | | | | | |
| Nitrate (as N) | | | 100.9 | | % | | 90-110 | 01-OCT-20 |
| WG3416630-1 | MB | | | | | | | |
| Nitrate (as N) | | | <0.020 | | mg/L | | 0.02 | 01-OCT-20 |
| WG3416630-10 | MB | | | | | | | |
| Nitrate (as N) | | | <0.020 | | mg/L | | 0.02 | 01-OCT-20 |
| WG3416630-12 | MB | | | | | | | |
| Nitrate (as N) | | | <0.020 | | mg/L | | 0.02 | 01-OCT-20 |
| WG3416630-14 | MB | | | | | | | |
| Nitrate (as N) | | | <0.020 | | mg/L | | 0.02 | 01-OCT-20 |
| WG3416630-16 | MB | | | | | | | |
| Nitrate (as N) | | | <0.020 | | mg/L | | 0.02 | 01-OCT-20 |
| WG3416630-4 | MS | L2509465-2 | | | | | | |
| Nitrate (as N) | | | 101.6 | | % | | 75-125 | 01-OCT-20 |
| NO3-L-IC-N-ED | | | | | | | | |
| | Water | | | | | | | |
| Batch | R5244590 | | | | | | | |
| WG3416630-3 | DUP | L2509465-2 | | | | | | |
| Nitrate (as N) | | 0.0161 | 0.0151 | | mg/L | 6.4 | 20 | 01-OCT-20 |
| WG3416630-11 | LCS | | | | | | | |
| Nitrate (as N) | | | 101.1 | | % | | 90-110 | 01-OCT-20 |
| WG3416630-13 | LCS | | | | | | | |
| Nitrate (as N) | | | 101.4 | | % | | 90-110 | 01-OCT-20 |
| WG3416630-15 | LCS | | | | | | | |
| Nitrate (as N) | | | 102.7 | | % | | 90-110 | 01-OCT-20 |
| WG3416630-2 | LCS | | | | | | | |
| Nitrate (as N) | | | 100.9 | | % | | 90-110 | 01-OCT-20 |
| WG3416630-9 | LCS | | | | | | | |
| Nitrate (as N) | | | 100.9 | | % | | 90-110 | 01-OCT-20 |
| WG3416630-1 | MB | | | | | | | |
| Nitrate (as N) | | | <0.0050 | | mg/L | | 0.005 | 01-OCT-20 |
| WG3416630-10 | MB | | | | | | | |
| Nitrate (as N) | | | <0.0050 | | mg/L | | 0.005 | 01-OCT-20 |
| WG3416630-12 | MB | | | | | | | |
| Nitrate (as N) | | | <0.0050 | | mg/L | | 0.005 | 01-OCT-20 |
| WG3416630-14 | MB | | | | | | | |

Quality Control Report

Workorder: L2509465

Report Date: 13-OCT-20

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|--------------------------------|-----------------|----------------------|---------|-----------|-------|-----|---------|-----------|
| NO3-L-IC-N-ED | | | | | | | | |
| Water | | | | | | | | |
| Batch | R5244590 | | | | | | | |
| WG3416630-14 | MB | | | | | | | |
| Nitrate (as N) | | | <0.0050 | | mg/L | | 0.005 | 01-OCT-20 |
| WG3416630-16 | MB | | | | | | | |
| Nitrate (as N) | | | <0.0050 | | mg/L | | 0.005 | 01-OCT-20 |
| WG3416630-4 | MS | L2509465-2 | | | | | | |
| Nitrate (as N) | | | 101.6 | | % | | 75-125 | 01-OCT-20 |
| P-T-COL-ED | | | | | | | | |
| Water | | | | | | | | |
| Batch | R5248641 | | | | | | | |
| WG3418669-2 | LCS | KONELAB_TP | | | | | | |
| Phosphorus (P)-Total | | | 99.9 | | % | | 80-120 | 06-OCT-20 |
| WG3418669-8 | LCS | | | | | | | |
| Phosphorus (P)-Total | | | 88.0 | | % | | 70-130 | 06-OCT-20 |
| WG3418669-1 | MB | | | | | | | |
| Phosphorus (P)-Total | | | <0.020 | | mg/L | | 0.02 | 06-OCT-20 |
| WG3418669-7 | MB | | | | | | | |
| Phosphorus (P)-Total | | | <0.020 | | mg/L | | 0.02 | 06-OCT-20 |
| P-TD-COL-ED | | | | | | | | |
| Water | | | | | | | | |
| Batch | R5248641 | | | | | | | |
| WG3418669-2 | LCS | KONELAB_TP | | | | | | |
| Phosphorus (P)-Total Dissolved | | | 101.7 | | % | | 80-120 | 06-OCT-20 |
| WG3418669-8 | LCS | | | | | | | |
| Phosphorus (P)-Total Dissolved | | | 87.9 | | % | | 70-130 | 06-OCT-20 |
| WG3418669-1 | MB | | | | | | | |
| Phosphorus (P)-Total Dissolved | | | <0.020 | | mg/L | | 0.02 | 06-OCT-20 |
| WG3418669-7 | MB | | | | | | | |
| Phosphorus (P)-Total Dissolved | | | <0.020 | | mg/L | | 0.02 | 06-OCT-20 |
| PH/EC/ALK-ED | | | | | | | | |
| Water | | | | | | | | |
| Batch | R5243520 | | | | | | | |
| WG3416460-12 | LCS | ED-PH6 | | | | | | |
| pH | | | 6.02 | | pH | | 5.8-6.2 | 01-OCT-20 |
| WG3416460-13 | LCS | MID_1412 | | | | | | |
| Conductivity (EC) | | | 96.2 | | % | | 90-110 | 01-OCT-20 |
| WG3416460-14 | LCS | PCTITRATE_LCS | | | | | | |
| Alkalinity, Total (as CaCO3) | | | 94.4 | | % | | 85-115 | 01-OCT-20 |
| WG3416460-2 | LCS | ED-PH6 | | | | | | |
| pH | | | 6.03 | | pH | | 5.8-6.2 | 01-OCT-20 |
| WG3416460-3 | LCS | MID_1412 | | | | | | |
| Conductivity (EC) | | | 101.8 | | % | | 90-110 | 01-OCT-20 |

Quality Control Report

Workorder: L2509465

Report Date: 13-OCT-20

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|------------------------------|-----------------|----------------------|--------|-----------|-------|-----|---------|-----------|
| PH/EC/ALK-ED | | Water | | | | | | |
| Batch | R5243520 | | | | | | | |
| WG3416460-4 | LCS | PCTITRATE_LCS | | | | | | |
| Alkalinity, Total (as CaCO3) | | | 101.1 | | % | | 85-115 | 01-OCT-20 |
| WG3416460-7 | LCS | ED-PH6 | | | | | | |
| pH | | | 6.04 | | pH | | 5.8-6.2 | 01-OCT-20 |
| WG3416460-8 | LCS | MID_1412 | | | | | | |
| Conductivity (EC) | | | 93.9 | | % | | 90-110 | 01-OCT-20 |
| WG3416460-9 | LCS | PCTITRATE_LCS | | | | | | |
| Alkalinity, Total (as CaCO3) | | | 95.0 | | % | | 85-115 | 01-OCT-20 |
| WG3416460-1 | MB | | | | | | | |
| Conductivity (EC) | | | <2.0 | | uS/cm | | 2 | 01-OCT-20 |
| Bicarbonate (HCO3) | | | <5.0 | | mg/L | | 5 | 01-OCT-20 |
| Carbonate (CO3) | | | <5.0 | | mg/L | | 5 | 01-OCT-20 |
| Hydroxide (OH) | | | <5.0 | | mg/L | | 5 | 01-OCT-20 |
| Alkalinity, Total (as CaCO3) | | | <2.0 | | mg/L | | 2 | 01-OCT-20 |
| WG3416460-11 | MB | | | | | | | |
| Conductivity (EC) | | | <2.0 | | uS/cm | | 2 | 01-OCT-20 |
| Bicarbonate (HCO3) | | | <5.0 | | mg/L | | 5 | 01-OCT-20 |
| Carbonate (CO3) | | | <5.0 | | mg/L | | 5 | 01-OCT-20 |
| Hydroxide (OH) | | | <5.0 | | mg/L | | 5 | 01-OCT-20 |
| Alkalinity, Total (as CaCO3) | | | <2.0 | | mg/L | | 2 | 01-OCT-20 |
| WG3416460-6 | MB | | | | | | | |
| Conductivity (EC) | | | <2.0 | | uS/cm | | 2 | 01-OCT-20 |
| Bicarbonate (HCO3) | | | <5.0 | | mg/L | | 5 | 01-OCT-20 |
| Carbonate (CO3) | | | <5.0 | | mg/L | | 5 | 01-OCT-20 |
| Hydroxide (OH) | | | <5.0 | | mg/L | | 5 | 01-OCT-20 |
| Alkalinity, Total (as CaCO3) | | | <2.0 | | mg/L | | 2 | 01-OCT-20 |
| SOLIDS-TDS-ED | | Water | | | | | | |
| Batch | R5244764 | | | | | | | |
| WG3416882-2 | LCS | | | | | | | |
| Total Dissolved Solids | | | 95.9 | | % | | 85-115 | 03-OCT-20 |
| WG3416882-1 | MB | | | | | | | |
| Total Dissolved Solids | | | <10 | | mg/L | | 10 | 03-OCT-20 |
| SOLIDS-TOTSUS-ED | | Water | | | | | | |
| Batch | R5244159 | | | | | | | |
| WG3416312-2 | LCS | | | | | | | |
| Total Suspended Solids | | | 88.6 | | % | | 85-115 | 02-OCT-20 |
| WG3416312-1 | MB | | | | | | | |



Quality Control Report

Workorder: L2509465

Report Date: 13-OCT-20

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| Test | Matrix | Reference | Result | Qualifier | Units | RPD | Limit | Analyzed |
|-------------------------|--------------|-----------|--------|-----------|-------|-----|--------|-----------|
| SOLIDS-TOTSUS-ED | Water | | | | | | | |
| Batch | R5244159 | | | | | | | |
| WG3416312-1 MB | | | | | | | | |
| Total Suspended Solids | | | <3.0 | | mg/L | | 3 | 02-OCT-20 |
| TURBIDITY-ED | Water | | | | | | | |
| Batch | R5244321 | | | | | | | |
| WG3417405-2 LCS | | | | | | | | |
| Turbidity | | | 97.5 | | % | | 85-115 | 02-OCT-20 |
| WG3417405-1 MB | | | | | | | | |
| Turbidity | | | <0.10 | | NTU | | 0.1 | 02-OCT-20 |

Quality Control Report

Workorder: L2509465

Report Date: 13-OCT-20

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Legend:

| | |
|-------|---|
| Limit | ALS Control Limit (Data Quality Objectives) |
| DUP | Duplicate |
| RPD | Relative Percent Difference |
| N/A | Not Available |
| LCS | Laboratory Control Sample |
| SRM | Standard Reference Material |
| MS | Matrix Spike |
| MSD | Matrix Spike Duplicate |
| ADE | Average Desorption Efficiency |
| MB | Method Blank |
| IRM | Internal Reference Material |
| CRM | Certified Reference Material |
| CCV | Continuing Calibration Verification |
| CVS | Calibration Verification Standard |
| LCSD | Laboratory Control Sample Duplicate |

Sample Parameter Qualifier Definitions:

| Qualifier | Description |
|-----------|--|
| J | Duplicate results and limits are expressed in terms of absolute difference. |
| MS-B | Matrix Spike recovery could not be accurately calculated due to high analyte background in sample. |
| RPD-NA | Relative Percent Difference Not Available due to result(s) being less than detection limit. |

Quality Control Report

Workorder: L2509465

Report Date: 13-OCT-20

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Hold Time Exceedances:

| ALS Product Description | Sample ID | Sampling Date | Date Processed | Rec. HT | Actual HT | Units | Qualifier |
|------------------------------------|-----------|-----------------|-----------------|---------|-----------|-------|-----------|
| Physical Tests | | | | | | | |
| Total Dissolved Solids | 1 | 20-SEP-20 11:00 | 03-OCT-20 00:00 | 7 | 13 | days | EHTR |
| | 2 | 20-SEP-20 12:00 | 03-OCT-20 00:00 | 7 | 13 | days | EHTR |
| Total Suspended Solids | 1 | 20-SEP-20 11:00 | 02-OCT-20 10:05 | 7 | 12 | days | EHTR |
| | 2 | 20-SEP-20 12:00 | 02-OCT-20 10:05 | 7 | 12 | days | EHTR |
| Turbidity | 1 | 20-SEP-20 11:00 | 02-OCT-20 10:00 | 3 | 12 | days | EHTR |
| | 2 | 20-SEP-20 12:00 | 02-OCT-20 10:00 | 3 | 12 | days | EHTR |
| Anions and Nutrients | | | | | | | |
| Nitrate in Water by IC | 1 | 20-SEP-20 11:00 | 01-OCT-20 08:00 | 3 | 11 | days | EHTR |
| | 2 | 20-SEP-20 12:00 | 01-OCT-20 08:00 | 3 | 11 | days | EHTR |
| Nitrate in Water by IC (Low Level) | 1 | 20-SEP-20 11:00 | 01-OCT-20 08:00 | 3 | 11 | days | EHTR |
| | 2 | 20-SEP-20 12:00 | 01-OCT-20 08:00 | 3 | 11 | days | EHTR |
| Nitrite in Water by IC | 1 | 20-SEP-20 11:00 | 01-OCT-20 08:00 | 3 | 11 | days | EHTR |
| | 2 | 20-SEP-20 12:00 | 01-OCT-20 08:00 | 3 | 11 | days | EHTR |
| Nitrite in Water by IC (Low Level) | 1 | 20-SEP-20 11:00 | 01-OCT-20 08:00 | 3 | 11 | days | EHTR |
| | 2 | 20-SEP-20 12:00 | 01-OCT-20 08:00 | 3 | 11 | days | EHTR |
| Aggregate Organics | | | | | | | |
| Biochemical Oxygen Demand (BOD) | 1 | 20-SEP-20 11:00 | 01-OCT-20 00:00 | 48 | 253 | hours | EHTR |
| | 2 | 20-SEP-20 12:00 | 01-OCT-20 00:00 | 48 | 252 | hours | EHTR |

Legend & Qualifier Definitions:

- EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended.
- EHTR: Exceeded ALS recommended hold time prior to sample receipt.
- EHTL: Exceeded ALS recommended hold time prior to analysis. Sample was received less than 24 hours prior to expiry.
- EHT: Exceeded ALS recommended hold time prior to analysis.
- Rec. HT: ALS recommended hold time (see units).

Notes*:

Where actual sampling date is not provided to ALS, the date (& time) of receipt is used for calculation purposes.
 Where actual sampling time is not provided to ALS, the earlier of 12 noon on the sampling date or the time (& date) of receipt is used for calculation purposes. Samples for L2509465 were received on 29-SEP-20 15:25.

ALS recommended hold times may vary by province. They are assigned to meet known provincial and/or federal government requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by the US EPA, APHA Standard Methods, or Environment Canada (where available). For more information, please contact ALS.

The ALS Quality Control Report is provided to ALS clients upon request. ALS includes comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against pre-determined data quality objectives to provide confidence in the accuracy of associated test results.

Please note that this report may contain QC results from anonymous Sample Duplicates and Matrix Spikes that do not originate from this Work Order.



AWC SOLUTIONS
 9087A 198 Street,
 Langley BC V1M 3B1
 ATTN: Jainish Patel

Date: 31-OCT-19
PO No.:
WO No.: L2368840
Project Ref: 10338-G
Sample ID: BACKWASH SEV3
Sampled By:
Date Collected: 20-OCT-19
Lab Sample ID: L2368840-2
Matrix: WATER

| Test Description | Result | Qualifier | Units of Measure | CDWQG MAC | Aesthetic Objective | Date Analyzed |
|---|------------|-----------|------------------|-----------|---------------------|---------------|
| Alkalinity Species by Titration | | | | | | |
| Alkalinity Species by Titration | | | | | | |
| Alkalinity, Bicarbonate (as CaCO3) | 233 | | mg/L | | | 24-OCT-19 |
| Alkalinity, Carbonate (as CaCO3) | 24.8 | | mg/L | | | 24-OCT-19 |
| Alkalinity, Hydroxide (as CaCO3) | <1.0 | | mg/L | | | 24-OCT-19 |
| Alkalinity, Total (as CaCO3) | 258 | | mg/L | | | 24-OCT-19 |
| Anions by Ion Chromatography | | | | | | |
| Sulfate in Water by IC | | | | | | |
| Sulfate (SO4) | 294 | | mg/L | | 500 | 24-OCT-19 |
| Nitrite in Water by IC (Low Level) | | | | | | |
| *Nitrite (as N) | 0.0097 | | mg/L | 1 | | 24-OCT-19 |
| Nitrate in Water by IC (Low Level) | | | | | | |
| *Nitrate (as N) | 0.029 | | mg/L | 10 | | 24-OCT-19 |
| Fluoride in Water by IC | | | | | | |
| Fluoride (F) | 0.27 | | mg/L | 1.5 | | 24-OCT-19 |
| Chloride in Water by IC | | | | | | |
| Chloride (Cl) | 8.5 | | mg/L | | 250 | 24-OCT-19 |
| Bromide in Water by IC (Low Level) | | | | | | |
| Bromide (Br) | <0.25 | DLDS | mg/L | | | 24-OCT-19 |
| Biochemical Oxygen Demand | 4.0 | | mg/L | | | 23-OCT-19 |
| COD | 115 | | mg/L | | | 30-OCT-19 |
| Colour, True | <5.0 | | CU | | 15 | 24-OCT-19 |
| Dissolved Organic Carbon | 8.81 | | mg/L | | | 24-OCT-19 |
| Hardness (as CaCO3) | 180 | HTC | mg/L | | 500 | 24-OCT-19 |
| Oil and Grease | <5.0 | | mg/L | | | 30-OCT-19 |
| Phenols (4AAP) | 0.0031 | | mg/L | | | 29-OCT-19 |
| Cyanide, Total | <0.0050 | | mg/L | 0.2 | | 28-OCT-19 |
| Total Dissolved Solids | 864 | | mg/L | | 500 | 24-OCT-19 |
| Mercury (Hg)-Total | <0.0000050 | | mg/L | 0.001 | | 26-OCT-19 |
| Total Suspended Solids | 46.9 | | mg/L | | | 24-OCT-19 |
| Total Organic Carbon | 9.77 | | mg/L | | | 24-OCT-19 |
| *Turbidity | 11.5 | | NTU | | | 24-OCT-19 |
| pH | 8.81 | | pH | | 7-10.5 | 24-OCT-19 |

ADDRESS: 314 Old Airport Road, Unit 116, Yellowknife, NT X1A 3T3 Canada | Phone: +1 867 873 5593 |
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AWC SOLUTIONS
 9087A 198 Street,
 Langley BC V1M 3B1
 ATTN: Jainish Patel

Date: 31-OCT-19
PO No.:
WO No.: L2368840
Project Ref: 10338-G
Sample ID: BACKWASH SEV3
Sampled By:
Date Collected: 20-OCT-19
Lab Sample ID: L2368840-2
Matrix: WATER


| Test Description | Result | Qualifier | Units of Measure | CDWQG MAC | Aesthetic Objective | Date Analyzed |
|---|-----------|-----------|------------------|-----------|---------------------|---------------|
| Total Metals in Water by CRC ICPMS | | | | | | |
| Aluminum (Al)-Total | 0.127 | | mg/L | | 0.1 | 24-OCT-19 |
| Antimony (Sb)-Total | <0.00010 | | mg/L | 0.006 | | 24-OCT-19 |
| Arsenic (As)-Total | 0.00032 | | mg/L | 0.01 | | 24-OCT-19 |
| Barium (Ba)-Total | 0.0223 | | mg/L | 1 | | 24-OCT-19 |
| Beryllium (Be)-Total | <0.00010 | | mg/L | | | 24-OCT-19 |
| Bismuth (Bi)-Total | <0.000050 | | mg/L | | | 24-OCT-19 |
| Boron (B)-Total | 0.024 | | mg/L | 5 | | 24-OCT-19 |
| Cadmium (Cd)-Total | 0.0000354 | | mg/L | 0.005 | | 24-OCT-19 |
| Calcium (Ca)-Total | 37.1 | | mg/L | | | 24-OCT-19 |
| Cesium (Cs)-Total | 0.000033 | | mg/L | | | 24-OCT-19 |
| Chromium (Cr)-Total | 0.00039 | | mg/L | 0.05 | | 24-OCT-19 |
| Cobalt (Co)-Total | <0.00010 | | mg/L | | | 24-OCT-19 |
| Copper (Cu)-Total | 0.00213 | | mg/L | 2.0 | 1.0 | 24-OCT-19 |
| Iron (Fe)-Total | 0.090 | | mg/L | | 0.3 | 24-OCT-19 |
| Lead (Pb)-Total | 0.000156 | | mg/L | 0.005 | | 24-OCT-19 |
| Lithium (Li)-Total | 0.0046 | | mg/L | | | 24-OCT-19 |
| Magnesium (Mg)-Total | 21.2 | | mg/L | | | 24-OCT-19 |
| Manganese (Mn)-Total | 0.00670 | | mg/L | 0.12 | 0.02 | 24-OCT-19 |
| Molybdenum (Mo)-Total | 0.000491 | | mg/L | | | 24-OCT-19 |
| Nickel (Ni)-Total | <0.00050 | | mg/L | | | 24-OCT-19 |
| Phosphorus (P)-Total | <0.050 | | mg/L | | | 24-OCT-19 |
| Potassium (K)-Total | 2.10 | | mg/L | | | 24-OCT-19 |
| Rubidium (Rb)-Total | 0.00161 | | mg/L | | | 24-OCT-19 |
| Selenium (Se)-Total | <0.000050 | | mg/L | 0.05 | | 24-OCT-19 |
| Silicon (Si)-Total | 1.42 | | mg/L | | | 24-OCT-19 |
| Silver (Ag)-Total | <0.000010 | | mg/L | | | 24-OCT-19 |
| Sodium (Na)-Total | 300 | | mg/L | | 200 | 24-OCT-19 |
| Strontium (Sr)-Total | 0.192 | | mg/L | 7 | | 24-OCT-19 |
| Sulfur (S)-Total | 184 | | mg/L | | | 24-OCT-19 |
| Tellurium (Te)-Total | <0.00020 | | mg/L | | | 24-OCT-19 |
| Thallium (Tl)-Total | <0.000010 | | mg/L | | | 24-OCT-19 |
| Thorium (Th)-Total | <0.00010 | | mg/L | | | 24-OCT-19 |
| Tin (Sn)-Total | 0.00021 | | mg/L | | | 24-OCT-19 |
| Titanium (Ti)-Total | <0.00030 | | mg/L | | | 24-OCT-19 |
| Tungsten (W)-Total | <0.00010 | | mg/L | | | 24-OCT-19 |
| Uranium (U)-Total | 0.00128 | | mg/L | 0.02 | | 24-OCT-19 |
| Vanadium (V)-Total | <0.00050 | | mg/L | | | 24-OCT-19 |
| Zinc (Zn)-Total | 0.0030 | | mg/L | | 5.0 | 24-OCT-19 |
| Zirconium (Zr)-Total | <0.00020 | | mg/L | | | 24-OCT-19 |

ADDRESS: 314 Old Airport Road, Unit 116, Yellowknife, NT X1A 3T3 Canada | Phone: +1 867 873 5593 |
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AWC SOLUTIONS
 9087A 198 Street,
 Langley BC V1M 3B1
 ATTN: Jainish Patel

Date: 31-OCT-19
PO No.:
WO No.: L2368840
Project Ref: 10338-G
Sample ID: BACKWASH SEV3
Sampled By:
Date Collected: 20-OCT-19
Lab Sample ID: L2368840-2
Matrix: WATER

| Test Description | Result | Qualifier | Units of Measure | CDWQG MAC | Aesthetic Objective | Date Analyzed |
|--|--------|-----------|------------------|-----------|---------------------|---------------|
| <p>CDWQG = Health Canada Guideline Limits updated JUNE 2019</p> <p>* CDWQG for Nitrate+Nitrite-N is the limit for nitrate only. If present as Nitrate then the limit is 10mg/L < or N.D. = less than detection limit. * Turbidity guideline based on membrane filtration. For guidelines on conventional treatment and slow sand or diatomaceous earth filtration please see Summary Table of Guidelines for Canadian Drinking Water Quality - A blank entry designates no known limit. - A shaded value in the Results column exceeds CDWQG MAC and/ or Aesthetic Objective.</p> | | | | | | |
| <p>Approved by  _____ Oliver Gregg Account Manager</p> | | | | | | |



AWC SOLUTIONS
 9087A 198 Street,
 Langley BC V1M 3B1
 ATTN: Jainish Patel

Date: 31-OCT-19
PO No.:
WO No.: L2368840
Project Ref: 10338-G
Sample ID: RAW WATER
Sampled By:
Date Collected: 20-OCT-19
Lab Sample ID: L2368840-3
Matrix: WATER

| Test Description | Result | Qualifier | Units of Measure | CDWQG MAC | Aesthetic Objective | Date Analyzed |
|---|------------|-----------|------------------|-----------|---------------------|---------------|
| Alkalinity Species by Titration | | | | | | |
| Alkalinity Species by Titration | | | | | | |
| Alkalinity, Bicarbonate (as CaCO3) | 114 | | mg/L | | | 24-OCT-19 |
| Alkalinity, Carbonate (as CaCO3) | <1.0 | | mg/L | | | 24-OCT-19 |
| Alkalinity, Hydroxide (as CaCO3) | <1.0 | | mg/L | | | 24-OCT-19 |
| Alkalinity, Total (as CaCO3) | 114 | | mg/L | | | 24-OCT-19 |
| Anions by Ion Chromatography | | | | | | |
| Sulfate in Water by IC | | | | | | |
| Sulfate (SO4) | 50.0 | | mg/L | | 500 | 24-OCT-19 |
| Nitrite in Water by IC (Low Level) | | | | | | |
| *Nitrite (as N) | <0.0010 | | mg/L | 1 | | 24-OCT-19 |
| Nitrate in Water by IC (Low Level) | | | | | | |
| *Nitrate (as N) | <0.0050 | | mg/L | 10 | | 24-OCT-19 |
| Fluoride in Water by IC | | | | | | |
| Fluoride (F) | 0.153 | | mg/L | 1.5 | | 24-OCT-19 |
| Chloride in Water by IC | | | | | | |
| Chloride (Cl) | 6.78 | | mg/L | | 250 | 24-OCT-19 |
| Bromide in Water by IC (Low Level) | | | | | | |
| Bromide (Br) | <0.050 | | mg/L | | | 24-OCT-19 |
| Biochemical Oxygen Demand | <2.0 | | mg/L | | | 23-OCT-19 |
| COD | <20 | | mg/L | | | 30-OCT-19 |
| Colour, True | <5.0 | | CU | | 15 | 24-OCT-19 |
| Dissolved Organic Carbon | 4.47 | | mg/L | | | 24-OCT-19 |
| Hardness (as CaCO3) | 153 | HTC | mg/L | | 500 | 24-OCT-19 |
| Oil and Grease | <5.0 | | mg/L | | | 30-OCT-19 |
| Phenols (4AAP) | <0.0010 | | mg/L | | | 28-OCT-19 |
| Cyanide, Total | <0.0050 | | mg/L | 0.2 | | 28-OCT-19 |
| Total Dissolved Solids | 215 | | mg/L | | 500 | 24-OCT-19 |
| Mercury (Hg)-Total | <0.0000050 | | mg/L | 0.001 | | 26-OCT-19 |
| Total Suspended Solids | <3.0 | | mg/L | | | 24-OCT-19 |
| Total Organic Carbon | 5.07 | | mg/L | | | 24-OCT-19 |
| *Turbidity | 0.33 | | NTU | | | 24-OCT-19 |
| pH | 8.18 | | pH | | 7-10.5 | 24-OCT-19 |

ADDRESS: 314 Old Airport Road, Unit 116, Yellowknife, NT X1A 3T3 Canada | Phone: +1 867 873 5593 |
 ALS CANADA LTD Part of the ALS Group A Campbell Brothers Limited Company



AWC SOLUTIONS
 9087A 198 Street,
 Langley BC V1M 3B1
 ATTN: Jainish Patel

Date: 31-OCT-19
PO No.:
WO No.: L2368840
Project Ref: 10338-G
Sample ID: RAW WATER
Sampled By:
Date Collected: 20-OCT-19
Lab Sample ID: L2368840-3
Matrix: WATER


| Test Description | Result | Qualifier | Units of Measure | CDWQG MAC | Aesthetic Objective | Date Analyzed |
|---|------------|-----------|------------------|-----------|---------------------|---------------|
| Total Metals in Water by CRC ICPMS | | | | | | |
| Aluminum (Al)-Total | 0.0034 | | mg/L | | 0.1 | 24-OCT-19 |
| Antimony (Sb)-Total | <0.00010 | | mg/L | 0.006 | | 24-OCT-19 |
| Arsenic (As)-Total | 0.00031 | | mg/L | 0.01 | | 24-OCT-19 |
| Barium (Ba)-Total | 0.0219 | | mg/L | 1 | | 24-OCT-19 |
| Beryllium (Be)-Total | <0.00010 | | mg/L | | | 24-OCT-19 |
| Bismuth (Bi)-Total | <0.000050 | | mg/L | | | 24-OCT-19 |
| Boron (B)-Total | 0.022 | | mg/L | 5 | | 24-OCT-19 |
| Cadmium (Cd)-Total | <0.0000050 | | mg/L | 0.005 | | 24-OCT-19 |
| Calcium (Ca)-Total | 36.3 | | mg/L | | | 24-OCT-19 |
| Cesium (Cs)-Total | <0.000010 | | mg/L | | | 24-OCT-19 |
| Chromium (Cr)-Total | <0.00010 | | mg/L | 0.05 | | 24-OCT-19 |
| Cobalt (Co)-Total | <0.00010 | | mg/L | | | 24-OCT-19 |
| Copper (Cu)-Total | 0.00188 | | mg/L | 2.0 | 1.0 | 24-OCT-19 |
| Iron (Fe)-Total | <0.010 | | mg/L | | 0.3 | 24-OCT-19 |
| Lead (Pb)-Total | 0.000872 | | mg/L | 0.005 | | 24-OCT-19 |
| Lithium (Li)-Total | 0.0042 | | mg/L | | | 24-OCT-19 |
| Magnesium (Mg)-Total | 15.2 | | mg/L | | | 24-OCT-19 |
| Manganese (Mn)-Total | 0.00186 | | mg/L | 0.12 | 0.02 | 24-OCT-19 |
| Molybdenum (Mo)-Total | 0.000379 | | mg/L | | | 24-OCT-19 |
| Nickel (Ni)-Total | <0.00050 | | mg/L | | | 24-OCT-19 |
| Phosphorus (P)-Total | <0.050 | | mg/L | | | 24-OCT-19 |
| Potassium (K)-Total | 1.80 | | mg/L | | | 24-OCT-19 |
| Rubidium (Rb)-Total | 0.00140 | | mg/L | | | 24-OCT-19 |
| Selenium (Se)-Total | <0.000050 | | mg/L | 0.05 | | 24-OCT-19 |
| Silicon (Si)-Total | 1.37 | | mg/L | | | 24-OCT-19 |
| Silver (Ag)-Total | <0.000010 | | mg/L | | | 24-OCT-19 |
| Sodium (Na)-Total | 5.08 | | mg/L | | 200 | 24-OCT-19 |
| Strontium (Sr)-Total | 0.191 | | mg/L | 7 | | 24-OCT-19 |
| Sulfur (S)-Total | 17.6 | | mg/L | | | 24-OCT-19 |
| Tellurium (Te)-Total | <0.00020 | | mg/L | | | 24-OCT-19 |
| Thallium (Tl)-Total | <0.000010 | | mg/L | | | 24-OCT-19 |
| Thorium (Th)-Total | <0.00010 | | mg/L | | | 24-OCT-19 |
| Tin (Sn)-Total | <0.00010 | | mg/L | | | 24-OCT-19 |
| Titanium (Ti)-Total | <0.00030 | | mg/L | | | 24-OCT-19 |
| Tungsten (W)-Total | <0.00010 | | mg/L | | | 24-OCT-19 |
| Uranium (U)-Total | 0.00129 | | mg/L | 0.02 | | 24-OCT-19 |
| Vanadium (V)-Total | <0.00050 | | mg/L | | | 24-OCT-19 |
| Zinc (Zn)-Total | 0.0033 | | mg/L | | 5.0 | 24-OCT-19 |
| Zirconium (Zr)-Total | <0.00020 | | mg/L | | | 24-OCT-19 |

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AWC SOLUTIONS
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Date: 31-OCT-19
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Sample ID: RAW WATER
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| Test Description | Result | Qualifier | Units of Measure | CDWQG MAC | Aesthetic Objective | Date Analyzed |
|--|--------|-----------|------------------|-----------|---------------------|---------------|
| <p>CDWQG = Health Canada Guideline Limits updated JUNE 2019</p> <p>* CDWQG for Nitrate+Nitrite-N is the limit for nitrate only. If present as Nitrate then the limit is 10mg/L < or N.D. = less than detection limit. * Turbidity guideline based on membrane filtration. For guidelines on conventional treatment and slow sand or diatomaceous earth filtration please see Summary Table of Guidelines for Canadian Drinking Water Quality - A blank entry designates no known limit. - A shaded value in the Results column exceeds CDWQG MAC and/ or Aesthetic Objective.</p> | | | | | | |
| <p>Approved by  _____ Oliver Gregg Account Manager</p> | | | | | | |

Guidelines & Objectives

Sample Parameter Qualifier key listed:

| Qualifier | Description |
|-----------|--|
| DLDS | Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity. |
| HTC | Hardness was calculated from Total Ca and/or Mg concentrations and may be biased high (dissolved Ca/Mg results unavailable). |

Health Canada MAC Health Related Criteria Limits

| | |
|--------------------|--|
| Nitrate/Nitrite-N* | Criteria limit is 10 mg/L (1.0 mg/L if present as all Nitrite-N). High concentrations may contribute to blue baby syndrome in infants. |
| Lead* | A cumulative body poison, uncommon in naturally occurring hard waters. |
| Fluoride* | Present in fluoridated water supplies at 0.8 mg/L to reduce dental caries. Elevated levels causes fluorosis (mottling of teeth). |
| Total Coliforms* | Criteria is 0 CFU/100mL. Adverse health effects. |
| E. Coli* | Criteria is 0 CFU/100 mL. Certain E. Coli bacteria can be life threatening. |
| Manganese* | Criteria limit is 0.12 mg/L. Possible neurological effects in infants. |

*Health Canada Canadian Drinking Water Quality Guidelines (MAC limit)

Aesthetic Objective Concentration Levels

| | |
|------------------------|--|
| Alkalinity | Acid neutralizing capacity. Usually a measure of carbonate and bicarbonates and calculated and reported as calcium carbonate. |
| Balance | Quality control parameter ratioing cations to anions |
| Bicarbonate | See Alkalinity. Report as the anion HCO ₃ -1 |
| Carbonate | See Alkalinity. Reported at the anion CO ₃ -2 |
| Calcium | See Hardness. Common major cation of water chemistry. |
| Chloride | Common major anion of water chemistry. |
| Conductance | Physical test measuring water salinity (dissolved ions or solids) |
| Hardness | Classical measure or capacity of water to precipitate soap (chiefly calcium and magnesium ions). Causes scaling tendency in water if carbonates/bicarbonates are present (if >200 mg/L). For drinking water purposes waters with results <200 mg/L are considered acceptable, results >200 mg/L are considered poor but can be tolerated. Results >500 mg/L are unacceptable. |
| Hydroxide | See alkalinity |
| Magnesium | See hardness. Common major cation of water chemistry. Elevated levels (>125 mg/L) may exert a cathartic or diuretic action. |
| pH | Measure of water acidity/alkalinity. Normal range is 7.0-8.5. |
| Potassium | Common major cation of water chemistry. |
| Sodium | Common major cation of water chemistry. Measure of salinity (saltiness).The aesthetic objective (not related to health) for sodium in drinking water is 200 mg/L. However, where sodium concentration of the drinking water exceeds 20 mg/L, it is recommended that any person on a sodium restricted diet consult with his/her physician or Medical Officer of Health concerning the use of that water. |
| Sulphate | Common major anion of water chemistry. Elevated levels may exert a cathartic or diuretic action. |
| Total Dissolved Solids | A measure of water salinity. |
| Iron | Causes staining to laundry and porcelain and astringent taste. Oxidizes to red-brown precipitate on exposure to air. |
| Heterotrophic | |
| Plate Count | Criteria is 500 cfu/mL Measure of heterotrophic bacteria present. |

GLOSSARY OF REPORT TERMS

Surrogates are compounds that are similar in behaviour to target analyte(s), but that do not normally occur in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery. In reports that display the D.L. column, laboratory objectives for surrogates are listed there.

mg/kg - milligrams per kilogram based on dry weight of sample

mg/kg wwt - milligrams per kilogram based on wet weight of sample

mg/kg lwt - milligrams per kilogram based on lipid-adjusted weight

mg/L - unit of concentration based on volume, parts per million.

< - Less than.

D.L. - The reporting limit.

N/A - Result not available. Refer to qualifier code and definition for explanation.

Test results reported relate only to the samples as received by the laboratory.

UNLESS OTHERWISE STATED, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Analytical results in unsigned test reports with the DRAFT watermark are subject to change, pending final QC review.