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Eagle Mountain - Woodfibre Gas Pipeline Project

BCER Waste Discharge Approval Report—BC Rail Site Sampling and Monitoring

Report Period: February 6th to February 12th, 2024




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Appendix A: Point of Discharge from Water Treatment System Documentation

Appendix B: Receiving Environment Documentation

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Preamble

This is a report for the British Columbia Energy Regulator (BCER) Waste Discharge Approval (BCER number AE 111824) for the FortisBC Eagle Mountain – Woodfibre Gas Pipeline (EGP) Project for the BC Rail Site. This report covers the period of February 6th to February 12th, 2024 and includes the results of water quality monitoring and sampling of the receiving environment (upstream and downstream) in the Squamish River. During this timeframe no discharge into the receiving environment in the Squamish River occurred from the BC Rail site water treatment plant. Tunnelling at the BC Rail site has not begun.

FortisBC has retained Triton Environmental Consultants Ltd. as the Qualified Professional to implement and oversee the monitoring and sampling program in the receiving environment. The data represented below, including laboratory reported exceedances, represent background conditions of the receiving environment, and are not related to EGP Project activities. The data collected and reported on represents background water quality conditions at the two receiving environment sampling sites as shown on the approved Waste Discharge Approval AE-111824.


Water Treatment Plant Update

Since the issuance of the Waste Discharge Approval (AE 111824) on September 29, 2023, FortisBC’s tunnel contractor Frontier-Kemper Michels Joint Venture (FKM) has commenced setting up the water treatment plant (WTP) including the installing the plumbing, pumps & equipment, and treatment chemicals. The commissioning process of the WTP began on October 22, 2023 and is continuing to date. Water will be sampled to confirm that the batch from the WTP meets the British Columbia Approved and Working Water Quality Guidelines for Freshwater & Marine Aquatic Life requirements prior to discharge as outlined in the Waste Discharge Approval.

Introduction

The results provided in this document are submitted to BC Energy Regulator (BCER) by FortisBC as per the requirements listed in the Waste Discharge Approval AE-111824 Section 4.2:

The Approval Holder shall summarize the results of the discharge and receiving environment compliance sampling and monitoring program in a report that shall be submitted weekly over the term of this approval. The sampling and monitoring results shall be suitably tabulated and include comparison to the respective British Columbia Approved and Working Water Quality Guidelines for Freshwater & Marine Aquatic Life, as published by the Ministry of Environment & Climate Change Strategy. Any exceedance of regulatory guidelines shall be clearly highlighted, and any missed sampling events/missing date shall be identified with an explanation provided. Reporting frequency may be reduced upon a history of compliance and by written confirmation from the BCER. These reports shall be submitted to Waste.Management@bc-er.ca. A copy of the reports shall be provided to each First Nation consulted with regarding this subject approval,

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and also made publicly available on the FortisBC Eagle Mountain-Woodfibre Gas Pipeline Project | Talking Energy webpage.

FortisBC requests that the BCER confirm the receipt of this submittal and confirm that the submission meets the requirements of reporting. Future reports will use this format unless otherwise directed by BCER.

Sampling Methodology

The monitoring and sampling has been carried out in accordance with the procedures described in the most recent edition of the “British Columbia Field Sampling Manual” using field equipment and lab samples to meet daily and real time requirements for the Waste Discharge Approval.

At the receiving environment, real time daily field readings of pH, temperature, NTU, electrical conductivity, DO, ORP and salinity are being taken using an AquaTROLL 600 datalogger upstream and downstream in the river. Visible sheen will be monitored with visual inspections during times of discharge or sampling. Real time and daily readings are being monitored at the same time with one piece of equipment, allowing all the daily readings real time.


At the point of discharge from the WTP, the parameters are being monitored using field equipment (YSI ProDSS) and sondes/real time meters make and models to be confirmed by the contractor. Table 1 and Table 2 below show how each parameter is being monitored.

Table 1. Monitoring Process at Point of Discharge from Water Treatment System at the BC Rail Site

Permit Frequency	Parameters	Details
Daily	Visible Sheen	In field inspection
Daily (or per batch)	DO	Monitoring using YSI ProDSS
	ORP	Monitoring using YSI ProDSS
	Salinity	Monitoring using YSI ProDSS
Real Time (or per batch)	pH	Monitoring using YSI ProDSS
	Temperature	Monitoring using YSI ProDSS
	NTU	Monitoring using YSI ProDSS
	Electrical Conductivity	Monitoring using YSI ProDSS
Weekly (or per batch) Lab Samples	List prescribed in permit	Lab samples

Table 2. Receiving Environment (upstream and downstream) Monitoring Process

Permit Frequency	Parameters	Details
Daily	Visible Sheen	In field inspection
Daily	DO	Monitoring using Sonde- AquaTROLL 600 datalogger
	ORP	Monitoring using Sonde- AquaTROLL 600 datalogger
	Salinity	Monitoring using Sonde- AquaTROLL 600 datalogger
Real Time	pH	Monitoring using Sonde- AquaTROLL 600 datalogger
	Temperature	Monitoring using Sonde- AquaTROLL 600 datalogger
	NTU	Monitoring using Sonde- AquaTROLL 600 datalogger

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Permit Frequency	Parameters	Details
	Electrical Conductivity	Monitoring using Sonde- AquaTROLL 600 datalogger
Weekly Lab Samples	List prescribed in permit	Lab samples

Receiving Environment equipment details: Sondes: Aqua-TROLL 600 made by In-Situ Inc. Sondes set up to log temperature, specific conductivity, salinity (in PSU), pH, ORP, DO (mg/L), and turbidity (NTU) at 10 minute intervals.

Point of Discharge from the WTP equipment details: YSI ProDSS with pH, conductivity, DO, ORP and turbidity probe that measure pH, temperature, NTU, electrical conductivity, ORP, DO and salinity

Summary

Activities

- No discharges to the receiving environment have occurred from the WTP within this reporting period. The WTP is currently being commissioned.

Point of Discharge from Water Treatment System (BC Rail Site) Summary

N/A - No discharge occurred during the reporting period.

Exceedance details

N/A - No discharge occurred during the reporting period.

Receiving Environment Summary


The receiving environment is being monitored as a permit requirement, currently, there are no discharges from the WTP to the receiving environment, so all recorded exceedances in the laboratory report are not project related and existing background quality.

Table 3: Upstream Monitoring Information

Date of Lab Sample	Real Time Monitored	Field Samples Taken	Results
2024-02-06	Yes *	Yes *	Full set of lab sample results, photo and documentation are provided in Appendix B.

Table 4: Downstream Monitoring Information


Date of Lab Sample	Real Time Monitored	Field Samples Taken	Results
2023-02-06	Yes *	Yes *	Full set of lab sample results, photo and documentation are provided in Appendix B.

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* Sondes set up to log temperature, specific conductivity, salinity (in PSU), pH, ORP, DO (mg/L), and turbidity (NTU) at 10 minute intervals.

Receiving Environment Monitoring Details


- Daily visible sheen checks have not been conducted in the receiving environment as there have not been any discharges from the WTP.
- All receiving environment lab results are in Appendix B.
- Recorded exceedances in the laboratory and field samples collected from the receiving environment (upstream and downstream) are indicative of the existing background water quality in the Squamish River, and are not related to the EGP Project activities.

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Appendix A Point of Discharge from Water Treatment Plant Documentation

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No discharge from the water treatment plant, nothing to report

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Appendix B Receiving Environment Documentation

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Receiving Environment Sample Analysis

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Receiving Environment Lab Documentation



CERTIFICATE OF ANALYSIS (GUIDELINE EVALUATION)

Work Order : VA24A2292
Client : Triton Environmental Consultants Ltd.
Contact : [Redacted]
Address : [Redacted]
Telephone : [Redacted]
Project : 11964
PO : 11964 - Task 20 - Phase 3C-4C
C-O-C number : ----
Sampler : ----
Site : Water Analysis
Quote number : VA23-TRIT100-012
No. of samples received : 2
No. of samples analysed : 2

Page : 1 of 7
Laboratory : ALS Environmental - Vancouver
Account Manager : [Redacted]
Address : [Redacted]
Telephone : [Redacted]
Date Samples Received : 06-Feb-2024 16:00
Date Analysis Commenced : 06-Feb-2024
Issue Date : 13-Feb-2024 14:57

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Guideline Comparison

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Angelo Salandanan	Lab Assistant	Metals, Burnaby, British Columbia
Ghazaleh Khanmirzaei	Analyst	Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Inorganics, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Paolo Obillo	Account Manager Assistant	Administration, Burnaby, British Columbia
Sam Silveira	Lab Assistant	Metals, Burnaby, British Columbia



No Breaches Found

General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QA/QC Compliance Assessment to assist with Quality Review and Sample Receipt Notification.

When sampling time information is not provided by the client, sampling dates are shown without a time component. In these instances, the time component has been assumed by the laboratory for processing purposes.

Application of guidelines is provided "as is" without warranty of any kind, either expressed or implied, including, but not limited to fitness for a particular purpose, or non-infringement. ALS assumes no responsibility for errors or omissions in the information. Guidelines are not adjusted for the hardness, pH or temperature of the sample (the most conservative values are used). Measurement uncertainty is not applied to test results prior to comparison with specified criteria values.

Key : LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
-	no units
°C	degrees celsius
µS/cm	microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

>: greater than.

<: less than.

Red shading is applied where the result or the LOR is greater than the Guideline Upper Limit (or lower than the Guideline Lower Limit, if applicable).

For drinking water samples, Red shading is applied where the result for E.coli, fecal or total coliforms is greater than or equal to the Guideline Upper Limit.



Analytical Results Evaluation

Matrix: Water				Client sample ID	SQU DS 1	SQU US 1	---	---	---	---	---
				Sampling date/time	06-Feb-2024 10:05	06-Feb-2024 11:01	---	---	---	---	---
				Sub-Matrix	Water	Water	---	---	---	---	---
Analyte	CAS Number	Method/Lab	Unit	VA24A2292-001	VA24A2292-002	-----	-----	-----	-----	-----	-----
Field Tests											
Conductivity, field	----	EF001/VA	µS/cm	53.000	56.000	---	---	---	---	---	---
pH, field	----	EF001/VA	pH units	7.00	6.96	---	---	---	---	---	---
Temperature, field	----	EF001/VA	°C	4.30	4.40	---	---	---	---	---	---
Physical Tests											
Hardness (as CaCO ₃), dissolved	----	EC100/VA	mg/L	16.9	17.8	---	---	---	---	---	---
Hardness (as CaCO ₃), from total Ca/Mg	----	EC100A/VA	mg/L	17.2	17.8	---	---	---	---	---	---
Solids, total dissolved [TDS]	----	E162/VA	mg/L	41	40	---	---	---	---	---	---
Solids, total suspended [TSS]	----	E160/VA	mg/L	5.7	3.1	---	---	---	---	---	---
Alkalinity, total (as CaCO ₃)	----	E290/VA	mg/L	14.9	16.5	---	---	---	---	---	---
Anions and Nutrients											
Ammonia, total (as N)	7664-41-7	E298/VA	mg/L	0.0840	0.184	---	---	---	---	---	---
Bromide	24959-67-9	E235.Br-L/VA	mg/L	<0.050	<0.050	---	---	---	---	---	---
Chloride	16887-00-6	E235.Cl/VA	mg/L	2.07	2.48	---	---	---	---	---	---
Fluoride	16984-48-8	E235.F/VA	mg/L	<0.020	<0.020	---	---	---	---	---	---
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	mg/L	0.0557	0.0558	---	---	---	---	---	---
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	mg/L	<0.0010	<0.0010	---	---	---	---	---	---
Nitrogen, total	7727-37-9	E366/VA	mg/L	0.213	0.327	---	---	---	---	---	---
Phosphorus, total	7723-14-0	E372-U/VA	mg/L	0.0210	0.0260	---	---	---	---	---	---
Sulfate (as SO ₄)	14808-79-8	E235.SO4/VA	mg/L	4.50	5.20	---	---	---	---	---	---
Organic / Inorganic Carbon											
Carbon, dissolved organic [DOC]	----	E358-L/VA	mg/L	1.57	1.46	---	---	---	---	---	---
Carbon, total organic [TOC]	----	E355-L/VA	mg/L	1.65	1.70	---	---	---	---	---	---
Total Sulfides											
Sulfide, total (as S)	18496-25-8	E395/VA	mg/L	<0.0015	<0.0015	---	---	---	---	---	---
Sulfide, un-ionized (as H ₂ S), from total	7783-06-4	EC395/VA	mg/L	<0.0015	<0.0015	---	---	---	---	---	---
Sulfide, total (as H ₂ S)	7783-06-4	E395/VA	mg/L	<0.0016	<0.0016	---	---	---	---	---	---
Total Metals											



Analytical Results Evaluation

Matrix: Water				Client sample ID	SQU DS 1	SQU US 1	----	----	----	----	----
				Sampling date/time	06-Feb-2024 10:05	06-Feb-2024 11:01	----	----	----	----	----
				Sub-Matrix	Water	Water	----	----	----	----	----
Analyte	CAS Number	Method/Lab	Unit	VA24A2292-001	VA24A2292-002	-----	-----	-----	-----	-----	-----
Total Metals											
Aluminum, total	7429-90-5	E420/VA	mg/L	0.314	0.189	----	----	----	----	----	----
Antimony, total	7440-36-0	E420/VA	mg/L	<0.00010	<0.00010	----	----	----	----	----	----
Arsenic, total	7440-38-2	E420/VA	mg/L	0.00016	0.00014	----	----	----	----	----	----
Barium, total	7440-39-3	E420/VA	mg/L	0.0109	0.00935	----	----	----	----	----	----
Beryllium, total	7440-41-7	E420/VA	mg/L	<0.000100	<0.000100	----	----	----	----	----	----
Bismuth, total	7440-69-9	E420/VA	mg/L	<0.000050	<0.000050	----	----	----	----	----	----
Boron, total	7440-42-8	E420/VA	mg/L	<0.010	<0.010	----	----	----	----	----	----
Cadmium, total	7440-43-9	E420/VA	mg/L	0.0000094	0.0000136	----	----	----	----	----	----
Calcium, total	7440-70-2	E420/VA	mg/L	5.70	5.96	----	----	----	----	----	----
Cesium, total	7440-46-2	E420/VA	mg/L	0.000020	0.000018	----	----	----	----	----	----
Chromium, total	7440-47-3	E420/VA	mg/L	<0.00050	<0.00050	----	----	----	----	----	----
Cobalt, total	7440-48-4	E420/VA	mg/L	0.00020	0.00012	----	----	----	----	----	----
Copper, total	7440-50-8	E420/VA	mg/L	0.00117	0.00098	----	----	----	----	----	----
Iron, total	7439-89-6	E420/VA	mg/L	0.362	0.311	----	----	----	----	----	----
Lead, total	7439-92-1	E420/VA	mg/L	0.000062	<0.000050	----	----	----	----	----	----
Lithium, total	7439-93-2	E420/VA	mg/L	<0.0010	<0.0010	----	----	----	----	----	----
Magnesium, total	7439-95-4	E420/VA	mg/L	0.712	0.703	----	----	----	----	----	----
Manganese, total	7439-96-5	E420/VA	mg/L	0.0147	0.0126	----	----	----	----	----	----
Mercury, total	7439-97-6	E508/VA	mg/L	<0.0000050	<0.0000050	----	----	----	----	----	----
Molybdenum, total	7439-98-7	E420/VA	mg/L	0.000524	0.000544	----	----	----	----	----	----
Nickel, total	7440-02-0	E420/VA	mg/L	<0.00050	<0.00050	----	----	----	----	----	----
Phosphorus, total	7723-14-0	E420/VA	mg/L	<0.050	0.058	----	----	----	----	----	----
Potassium, total	7440-09-7	E420/VA	mg/L	0.620	0.626	----	----	----	----	----	----
Rubidium, total	7440-17-7	E420/VA	mg/L	0.00111	0.00097	----	----	----	----	----	----
Selenium, total	7782-49-2	E420/VA	mg/L	<0.000050	<0.000050	----	----	----	----	----	----
Silicon, total	7440-21-3	E420/VA	mg/L	5.07	5.16	----	----	----	----	----	----
Silver, total	7440-22-4	E420/VA	mg/L	<0.000010	<0.000010	----	----	----	----	----	----
Sodium, total	7440-23-5	E420/VA	mg/L	2.35	2.53	----	----	----	----	----	----
Strontium, total	7440-24-6	E420/VA	mg/L	0.0354	0.0358	----	----	----	----	----	----



Analytical Results Evaluation

Matrix: Water				Client sample ID	SQU DS 1	SQU US 1	----	----	----	----	----
				Sampling date/time	06-Feb-2024 10:05	06-Feb-2024 11:01	----	----	----	----	----
				Sub-Matrix	Water	Water	----	----	----	----	----
Analyte	CAS Number	Method/Lab	Unit	VA24A2292-001	VA24A2292-002	-----	-----	-----	-----	-----	-----
Total Metals											
Sulfur, total	7704-34-9	E420/VA	mg/L	1.36	1.55	----	----	----	----	----	----
Tellurium, total	13494-80-9	E420/VA	mg/L	<0.00020	<0.00020	----	----	----	----	----	----
Thallium, total	7440-28-0	E420/VA	mg/L	<0.000010	<0.000010	----	----	----	----	----	----
Thorium, total	7440-29-1	E420/VA	mg/L	<0.00010	<0.00010	----	----	----	----	----	----
Tin, total	7440-31-5	E420/VA	mg/L	<0.00010	<0.00010	----	----	----	----	----	----
Titanium, total	7440-32-6	E420/VA	mg/L	0.0144	0.00707	----	----	----	----	----	----
Tungsten, total	7440-33-7	E420/VA	mg/L	<0.00010	<0.00010	----	----	----	----	----	----
Uranium, total	7440-61-1	E420/VA	mg/L	0.000042	0.000030	----	----	----	----	----	----
Vanadium, total	7440-62-2	E420/VA	mg/L	0.00159	0.00142	----	----	----	----	----	----
Zinc, total	7440-66-6	E420/VA	mg/L	<0.0030	<0.0030	----	----	----	----	----	----
Zirconium, total	7440-67-7	E420/VA	mg/L	<0.00020	<0.00020	----	----	----	----	----	----
Dissolved Metals											
Aluminum, dissolved	7429-90-5	E421/VA	mg/L	0.0437	0.0390	----	----	----	----	----	----
Antimony, dissolved	7440-36-0	E421/VA	mg/L	<0.00010	<0.00010	----	----	----	----	----	----
Arsenic, dissolved	7440-38-2	E421/VA	mg/L	0.00014	0.00012	----	----	----	----	----	----
Barium, dissolved	7440-39-3	E421/VA	mg/L	0.00828	0.00827	----	----	----	----	----	----
Beryllium, dissolved	7440-41-7	E421/VA	mg/L	<0.000100	<0.000100	----	----	----	----	----	----
Bismuth, dissolved	7440-69-9	E421/VA	mg/L	<0.000050	<0.000050	----	----	----	----	----	----
Boron, dissolved	7440-42-8	E421/VA	mg/L	0.010	<0.010	----	----	----	----	----	----
Cadmium, dissolved	7440-43-9	E421/VA	mg/L	0.0000074	0.0000087	----	----	----	----	----	----
Calcium, dissolved	7440-70-2	E421/VA	mg/L	5.72	6.03	----	----	----	----	----	----
Cesium, dissolved	7440-46-2	E421/VA	mg/L	0.000011	0.000012	----	----	----	----	----	----
Chromium, dissolved	7440-47-3	E421/VA	mg/L	<0.00050	<0.00050	----	----	----	----	----	----
Cobalt, dissolved	7440-48-4	E421/VA	mg/L	<0.00010	<0.00010	----	----	----	----	----	----
Copper, dissolved	7440-50-8	E421/VA	mg/L	0.00072	0.00072	----	----	----	----	----	----
Iron, dissolved	7439-89-6	E421/VA	mg/L	0.105	0.180	----	----	----	----	----	----
Lead, dissolved	7439-92-1	E421/VA	mg/L	<0.000050	<0.000050	----	----	----	----	----	----
Lithium, dissolved	7439-93-2	E421/VA	mg/L	<0.0010	<0.0010	----	----	----	----	----	----



Analytical Results Evaluation

Matrix: Water				Client sample ID	SQU DS 1	SQU US 1	----	----	----	----	----
				Sampling date/time	06-Feb-2024 10:05	06-Feb-2024 11:01	----	----	----	----	----
				Sub-Matrix	Water	Water	----	----	----	----	----
Analyte	CAS Number	Method/Lab	Unit	VA24A2292-001	VA24A2292-002	-----	-----	-----	-----	-----	-----
Dissolved Metals											
Magnesium, dissolved	7439-95-4	E421/VA	mg/L	0.645	0.679	----	----	----	----	----	----
Manganese, dissolved	7439-96-5	E421/VA	mg/L	0.00976	0.0102	----	----	----	----	----	----
Mercury, dissolved	7439-97-6	E509/VA	mg/L	<0.0000050	<0.0000050	----	----	----	----	----	----
Molybdenum, dissolved	7439-98-7	E421/VA	mg/L	0.000596	0.000564	----	----	----	----	----	----
Nickel, dissolved	7440-02-0	E421/VA	mg/L	<0.00050	<0.00050	----	----	----	----	----	----
Phosphorus, dissolved	7723-14-0	E421/VA	mg/L	<0.050	<0.050	----	----	----	----	----	----
Potassium, dissolved	7440-09-7	E421/VA	mg/L	0.618	0.628	----	----	----	----	----	----
Rubidium, dissolved	7440-17-7	E421/VA	mg/L	0.00089	0.00088	----	----	----	----	----	----
Selenium, dissolved	7782-49-2	E421/VA	mg/L	<0.000050	<0.000050	----	----	----	----	----	----
Silicon, dissolved	7440-21-3	E421/VA	mg/L	4.60	4.99	----	----	----	----	----	----
Silver, dissolved	7440-22-4	E421/VA	mg/L	<0.000010	<0.000010	----	----	----	----	----	----
Sodium, dissolved	7440-23-5	E421/VA	mg/L	2.35	2.51	----	----	----	----	----	----
Strontium, dissolved	7440-24-6	E421/VA	mg/L	0.0346	0.0362	----	----	----	----	----	----
Sulfur, dissolved	7704-34-9	E421/VA	mg/L	1.65	1.72	----	----	----	----	----	----
Tellurium, dissolved	13494-80-9	E421/VA	mg/L	<0.00020	<0.00020	----	----	----	----	----	----
Thallium, dissolved	7440-28-0	E421/VA	mg/L	<0.000010	<0.000010	----	----	----	----	----	----
Thorium, dissolved	7440-29-1	E421/VA	mg/L	<0.00010	<0.00010	----	----	----	----	----	----
Tin, dissolved	7440-31-5	E421/VA	mg/L	<0.00010	<0.00010	----	----	----	----	----	----
Titanium, dissolved	7440-32-6	E421/VA	mg/L	0.00074	0.00048	----	----	----	----	----	----
Tungsten, dissolved	7440-33-7	E421/VA	mg/L	<0.00010	<0.00010	----	----	----	----	----	----
Uranium, dissolved	7440-61-1	E421/VA	mg/L	0.000032	0.000027	----	----	----	----	----	----
Vanadium, dissolved	7440-62-2	E421/VA	mg/L	0.00099	0.00112	----	----	----	----	----	----
Zinc, dissolved	7440-66-6	E421/VA	mg/L	0.0013	0.0015	----	----	----	----	----	----
Zirconium, dissolved	7440-67-7	E421/VA	mg/L	<0.00020	<0.00020	----	----	----	----	----	----
Dissolved mercury filtration location	----	EP509/VA	-	Field	Field	----	----	----	----	----	----
Dissolved metals filtration location	----	EP421/VA	-	Field	Field	----	----	----	----	----	----
Speciated Metals											
Chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A/VA	mg/L	<0.00050	<0.00050	----	----	----	----	----	----



Analytical Results Evaluation

Matrix: Water				Client sample ID	SQU DS 1	SQU US 1	----	----	----	----	----
				Sampling date/time	06-Feb-2024 10:05	06-Feb-2024 11:01	----	----	----	----	----
				Sub-Matrix	Water	Water	----	----	----	----	----
Analyte	CAS Number	Method/Lab	Unit	VA24A2292-001	VA24A2292-002	-----	-----	-----	-----	-----	-----
Speciated Metals											
Chromium, hexavalent [Cr VI], total	18540-29-9	E532/VA	mg/L	<0.00050	0.00052	----	----	----	----	----	----
Chromium, trivalent [Cr III], dissolved	16065-83-1	EC535A/VA	mg/L	<0.00050	<0.00050	----	----	----	----	----	----
Chromium, trivalent [Cr III], total	16065-83-1	EC535/VA	mg/L	<0.00050	<0.00050	----	----	----	----	----	----

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.

Key:

CERTIFICATE OF ANALYSIS

Work Order : **VA24A2292**
Client : **Triton Environmental Consultants Ltd.**
Contact :
Address :

Telephone :
Project : 11964
PO : 11964 - Task 20 - Phase 3C-4C
C-O-C number : ----
Sampler : ----
Site : Water Analysis
Quote number : VA23-TRIT100-012
No. of samples received : 2
No. of samples analysed : 2

Page : 1 of 8
Laboratory : ALS Environmental - Vancouver
Account Manager :
Address :

Telephone :
Date Samples Received : 06-Feb-2024 16:00
Date Analysis Commenced : 06-Feb-2024
Issue Date : 13-Feb-2024 14:57

This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

Additional information pertinent to this report will be found in the following separate attachments: Quality Control Report, QC Interpretive report to assist with Quality Review and Sample Receipt Notification (SRN).

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Angelo Salandanan	Lab Assistant	Metals, Burnaby, British Columbia
Angelo Salandanan	Lab Assistant	Metals, Burnaby, British Columbia
Ghazaleh Khanmirzaei	Analyst	Metals, Burnaby, British Columbia
Ghazaleh Khanmirzaei	Analyst	Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Inorganics, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Inorganics, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Paolo Obillo	Account Manager Assistant	Administration, Burnaby, British Columbia
Paolo Obillo	Account Manager Assistant	Administration, Burnaby, British Columbia
Sam Silveira	Lab Assistant	Metals, Burnaby, British Columbia
Sam Silveira	Lab Assistant	Metals, Burnaby, British Columbia



General Comments

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Refer to the ALS Quality Control Interpretive report (QCI) for applicable references and methodology summaries. Reference methods may incorporate modifications to improve performance.

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances
LOR: Limit of Reporting (detection limit).

<i>Unit</i>	<i>Description</i>
-	no units
°C	degrees celsius
µS/cm	microsiemens per centimetre
mg/L	milligrams per litre
pH units	pH units

<: less than.

>: greater than.

Surrogate: An analyte that is similar in behavior to target analyte(s), but that does not occur naturally in environmental samples. For applicable tests, surrogates are added to samples prior to analysis as a check on recovery.

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

UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.



Analytical Results

Sub-Matrix: Water					Client sample ID	SQU DS 1	SQU US 1	---	---	---
(Matrix: Water)					Client sampling date / time	06-Feb-2024 10:05	06-Feb-2024 11:01	---	---	---
Analyte	CAS Number	Method/Lab	LOR	Unit	VA24A2292-001	VA24A2292-002	-----	-----	-----	
					Result	Result	---	---	---	
Field Tests										
Conductivity, field	---	EF001/VA	0.10	µS/cm	53.000	56.000	---	---	---	
pH, field	---	EF001/VA	0.10	pH units	7.00	6.96	---	---	---	
Temperature, field	---	EF001/VA	0.10	°C	4.30	4.40	---	---	---	
Physical Tests										
Hardness (as CaCO3), dissolved	---	EC100/VA	0.60	mg/L	16.9	17.8	---	---	---	
Hardness (as CaCO3), from total Ca/Mg	---	EC100A/VA	0.60	mg/L	17.2	17.8	---	---	---	
Solids, total dissolved [TDS]	---	E162/VA	10	mg/L	41	40	---	---	---	
Solids, total suspended [TSS]	---	E160/VA	3.0	mg/L	5.7	3.1	---	---	---	
Alkalinity, total (as CaCO3)	---	E290/VA	2.0	mg/L	14.9	16.5	---	---	---	
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/VA	0.0050	mg/L	0.0840	0.184	---	---	---	
Bromide	24959-67-9	E235.Br-L/VA	0.050	mg/L	<0.050	<0.050	---	---	---	
Chloride	16887-00-6	E235.Cl/VA	0.50	mg/L	2.07	2.48	---	---	---	
Fluoride	16984-48-8	E235.F/VA	0.020	mg/L	<0.020	<0.020	---	---	---	
Nitrate (as N)	14797-55-8	E235.NO3-L/V A	0.0050	mg/L	0.0557	0.0558	---	---	---	
Nitrite (as N)	14797-65-0	E235.NO2-L/V A	0.0010	mg/L	<0.0010	<0.0010	---	---	---	
Nitrogen, total	7727-37-9	E366/VA	0.030	mg/L	0.213	0.327	---	---	---	
Phosphorus, total	7723-14-0	E372-U/VA	0.0020	mg/L	0.0210	0.0260	---	---	---	
Sulfate (as SO4)	14808-79-8	E235.SO4/VA	0.30	mg/L	4.50	5.20	---	---	---	
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	---	E358-L/VA	0.50	mg/L	1.57	1.46	---	---	---	
Carbon, total organic [TOC]	---	E355-L/VA	0.50	mg/L	1.65	1.70	---	---	---	
Total Sulfides										
Sulfide, total (as S)	18496-25-8	E395/VA	0.0015	mg/L	<0.0015	<0.0015	---	---	---	
Sulfide, un-ionized (as H2S), from total	7783-06-4	EC395/VA	0.0015	mg/L	<0.0015	<0.0015	---	---	---	
Sulfide, total (as H2S)	7783-06-4	E395/VA	0.0016	mg/L	<0.0016	<0.0016	---	---	---	
Total Metals										
Aluminum, total	7429-90-5	E420/VA	0.0030	mg/L	0.314	0.189	---	---	---	



Analytical Results

Sub-Matrix: Water					Client sample ID	SQU DS 1	SQU US 1	----	----	----
(Matrix: Water)					Client sampling date / time	06-Feb-2024 10:05	06-Feb-2024 11:01	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	VA24A2292-001	VA24A2292-002	-----	-----	-----	
					Result	Result	----	----	----	
Total Metals										
Antimony, total	7440-36-0	E420/VA	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
Arsenic, total	7440-38-2	E420/VA	0.00010	mg/L	0.00016	0.00014	----	----	----	
Barium, total	7440-39-3	E420/VA	0.00010	mg/L	0.0109	0.00935	----	----	----	
Beryllium, total	7440-41-7	E420/VA	0.000100	mg/L	<0.000100	<0.000100	----	----	----	
Bismuth, total	7440-69-9	E420/VA	0.000050	mg/L	<0.000050	<0.000050	----	----	----	
Boron, total	7440-42-8	E420/VA	0.010	mg/L	<0.010	<0.010	----	----	----	
Cadmium, total	7440-43-9	E420/VA	0.0000050	mg/L	0.0000094	0.0000136	----	----	----	
Calcium, total	7440-70-2	E420/VA	0.050	mg/L	5.70	5.96	----	----	----	
Cesium, total	7440-46-2	E420/VA	0.000010	mg/L	0.000020	0.000018	----	----	----	
Chromium, total	7440-47-3	E420/VA	0.00050	mg/L	<0.00050	<0.00050	----	----	----	
Cobalt, total	7440-48-4	E420/VA	0.00010	mg/L	0.00020	0.00012	----	----	----	
Copper, total	7440-50-8	E420/VA	0.00050	mg/L	0.00117	0.00098	----	----	----	
Iron, total	7439-89-6	E420/VA	0.010	mg/L	0.362	0.311	----	----	----	
Lead, total	7439-92-1	E420/VA	0.000050	mg/L	0.000062	<0.000050	----	----	----	
Lithium, total	7439-93-2	E420/VA	0.0010	mg/L	<0.0010	<0.0010	----	----	----	
Magnesium, total	7439-95-4	E420/VA	0.0050	mg/L	0.712	0.703	----	----	----	
Manganese, total	7439-96-5	E420/VA	0.00010	mg/L	0.0147	0.0126	----	----	----	
Mercury, total	7439-97-6	E508/VA	0.0000050	mg/L	<0.0000050	<0.0000050	----	----	----	
Molybdenum, total	7439-98-7	E420/VA	0.000050	mg/L	0.000524	0.000544	----	----	----	
Nickel, total	7440-02-0	E420/VA	0.00050	mg/L	<0.00050	<0.00050	----	----	----	
Phosphorus, total	7723-14-0	E420/VA	0.050	mg/L	<0.050	0.058	----	----	----	
Potassium, total	7440-09-7	E420/VA	0.050	mg/L	0.620	0.626	----	----	----	
Rubidium, total	7440-17-7	E420/VA	0.00020	mg/L	0.00111	0.00097	----	----	----	
Selenium, total	7782-49-2	E420/VA	0.000050	mg/L	<0.000050	<0.000050	----	----	----	
Silicon, total	7440-21-3	E420/VA	0.10	mg/L	5.07	5.16	----	----	----	
Silver, total	7440-22-4	E420/VA	0.000010	mg/L	<0.000010	<0.000010	----	----	----	
Sodium, total	7440-23-5	E420/VA	0.050	mg/L	2.35	2.53	----	----	----	
Strontium, total	7440-24-6	E420/VA	0.00020	mg/L	0.0354	0.0358	----	----	----	
Sulfur, total	7704-34-9	E420/VA	0.50	mg/L	1.36	1.55	----	----	----	
Tellurium, total	13494-80-9	E420/VA	0.00020	mg/L	<0.00020	<0.00020	----	----	----	



Analytical Results

Sub-Matrix: Water					Client sample ID	SQU DS 1	SQU US 1	----	----	----
(Matrix: Water)					Client sampling date / time	06-Feb-2024 10:05	06-Feb-2024 11:01	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	VA24A2292-001	VA24A2292-002	-----	-----	-----	
					Result	Result	----	----	----	
Total Metals										
Thallium, total	7440-28-0	E420/VA	0.000010	mg/L	<0.000010	<0.000010	----	----	----	
Thorium, total	7440-29-1	E420/VA	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
Tin, total	7440-31-5	E420/VA	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
Titanium, total	7440-32-6	E420/VA	0.00030	mg/L	0.0144	0.00707	----	----	----	
Tungsten, total	7440-33-7	E420/VA	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
Uranium, total	7440-61-1	E420/VA	0.000010	mg/L	0.000042	0.000030	----	----	----	
Vanadium, total	7440-62-2	E420/VA	0.00050	mg/L	0.00159	0.00142	----	----	----	
Zinc, total	7440-66-6	E420/VA	0.0030	mg/L	<0.0030	<0.0030	----	----	----	
Zirconium, total	7440-67-7	E420/VA	0.00020	mg/L	<0.00020	<0.00020	----	----	----	
Dissolved Metals										
Aluminum, dissolved	7429-90-5	E421/VA	0.0010	mg/L	0.0437	0.0390	----	----	----	
Antimony, dissolved	7440-36-0	E421/VA	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
Arsenic, dissolved	7440-38-2	E421/VA	0.00010	mg/L	0.00014	0.00012	----	----	----	
Barium, dissolved	7440-39-3	E421/VA	0.00010	mg/L	0.00828	0.00827	----	----	----	
Beryllium, dissolved	7440-41-7	E421/VA	0.000100	mg/L	<0.000100	<0.000100	----	----	----	
Bismuth, dissolved	7440-69-9	E421/VA	0.000050	mg/L	<0.000050	<0.000050	----	----	----	
Boron, dissolved	7440-42-8	E421/VA	0.010	mg/L	0.010	<0.010	----	----	----	
Cadmium, dissolved	7440-43-9	E421/VA	0.0000050	mg/L	0.0000074	0.0000087	----	----	----	
Calcium, dissolved	7440-70-2	E421/VA	0.050	mg/L	5.72	6.03	----	----	----	
Cesium, dissolved	7440-46-2	E421/VA	0.000010	mg/L	0.000011	0.000012	----	----	----	
Chromium, dissolved	7440-47-3	E421/VA	0.00050	mg/L	<0.00050	<0.00050	----	----	----	
Cobalt, dissolved	7440-48-4	E421/VA	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
Copper, dissolved	7440-50-8	E421/VA	0.00020	mg/L	0.00072	0.00072	----	----	----	
Iron, dissolved	7439-89-6	E421/VA	0.010	mg/L	0.105	0.180	----	----	----	
Lead, dissolved	7439-92-1	E421/VA	0.000050	mg/L	<0.000050	<0.000050	----	----	----	
Lithium, dissolved	7439-93-2	E421/VA	0.0010	mg/L	<0.0010	<0.0010	----	----	----	
Magnesium, dissolved	7439-95-4	E421/VA	0.0050	mg/L	0.645	0.679	----	----	----	
Manganese, dissolved	7439-96-5	E421/VA	0.00010	mg/L	0.00976	0.0102	----	----	----	
Mercury, dissolved	7439-97-6	E509/VA	0.0000050	mg/L	<0.0000050	<0.0000050	----	----	----	
Molybdenum, dissolved	7439-98-7	E421/VA	0.000050	mg/L	0.000596	0.000564	----	----	----	



Analytical Results

Sub-Matrix: Water					Client sample ID	SQU DS 1	SQU US 1	----	----	----
(Matrix: Water)					Client sampling date / time	06-Feb-2024 10:05	06-Feb-2024 11:01	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	VA24A2292-001	VA24A2292-002	-----	-----	-----	
					Result	Result	----	----	----	
Dissolved Metals										
Nickel, dissolved	7440-02-0	E421/VA	0.00050	mg/L	<0.00050	<0.00050	----	----	----	
Phosphorus, dissolved	7723-14-0	E421/VA	0.050	mg/L	<0.050	<0.050	----	----	----	
Potassium, dissolved	7440-09-7	E421/VA	0.050	mg/L	0.618	0.628	----	----	----	
Rubidium, dissolved	7440-17-7	E421/VA	0.00020	mg/L	0.00089	0.00088	----	----	----	
Selenium, dissolved	7782-49-2	E421/VA	0.000050	mg/L	<0.000050	<0.000050	----	----	----	
Silicon, dissolved	7440-21-3	E421/VA	0.050	mg/L	4.60	4.99	----	----	----	
Silver, dissolved	7440-22-4	E421/VA	0.000010	mg/L	<0.000010	<0.000010	----	----	----	
Sodium, dissolved	7440-23-5	E421/VA	0.050	mg/L	2.35	2.51	----	----	----	
Strontium, dissolved	7440-24-6	E421/VA	0.00020	mg/L	0.0346	0.0362	----	----	----	
Sulfur, dissolved	7704-34-9	E421/VA	0.50	mg/L	1.65	1.72	----	----	----	
Tellurium, dissolved	13494-80-9	E421/VA	0.00020	mg/L	<0.00020	<0.00020	----	----	----	
Thallium, dissolved	7440-28-0	E421/VA	0.000010	mg/L	<0.000010	<0.000010	----	----	----	
Thorium, dissolved	7440-29-1	E421/VA	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
Tin, dissolved	7440-31-5	E421/VA	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
Titanium, dissolved	7440-32-6	E421/VA	0.00030	mg/L	0.00074	0.00048	----	----	----	
Tungsten, dissolved	7440-33-7	E421/VA	0.00010	mg/L	<0.00010	<0.00010	----	----	----	
Uranium, dissolved	7440-61-1	E421/VA	0.000010	mg/L	0.000032	0.000027	----	----	----	
Vanadium, dissolved	7440-62-2	E421/VA	0.00050	mg/L	0.00099	0.00112	----	----	----	
Zinc, dissolved	7440-66-6	E421/VA	0.0010	mg/L	0.0013	0.0015	----	----	----	
Zirconium, dissolved	7440-67-7	E421/VA	0.00020	mg/L	<0.00020	<0.00020	----	----	----	
Dissolved mercury filtration location	----	EP509/VA	-	-	Field	Field	----	----	----	
Dissolved metals filtration location	----	EP421/VA	-	-	Field	Field	----	----	----	
Speciated Metals										
Chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A/VA	0.00050	mg/L	<0.00050	<0.00050	----	----	----	
Chromium, hexavalent [Cr VI], total	18540-29-9	E532/VA	0.00050	mg/L	<0.00050	0.00052	----	----	----	
Chromium, trivalent [Cr III], dissolved	16065-83-1	EC535A/VA	0.00050	mg/L	<0.00050	<0.00050	----	----	----	
Chromium, trivalent [Cr III], total	16065-83-1	EC535/VA	0.00050	mg/L	<0.00050	<0.00050	----	----	----	

Please refer to the General Comments section for an explanation of any result qualifiers detected.

Please refer to the Accreditation section for an explanation of analyte accreditations.



QUALITY CONTROL INTERPRETIVE REPORT

<p>Work Order : VA24A2292</p> <p>Client : Trifon Environmental Consultants Ltd.</p> <p>Contact : [REDACTED]</p> <p>Address : [REDACTED]</p> <p>Telephone : [REDACTED]</p> <p>Project : 11964</p> <p>PO : 11964 - Task 20 - Phase 3C-4C</p> <p>C-O-C number : ----</p> <p>Sampler : ----</p> <p>Site : Water Analysis</p> <p>Quote number : VA23-TRIT100-012</p> <p>No. of samples received : 2</p> <p>No. of samples analysed : 2</p>	<p>Page : 1 of 16</p> <p>Laboratory : ALS Environmental - Vancouver</p> <p>Account Manager : [REDACTED]</p> <p>Address : [REDACTED]</p> <p>Telephone : [REDACTED]</p> <p>Date Samples Received : 06-Feb-2024 16:00</p> <p>Issue Date : 13-Feb-2024 14:58</p>
--	---

This report is automatically generated by the ALS LIMS (Laboratory Information Management System) through evaluation of Quality Control (QC) results and other QA parameters associated with this submission, and is intended to facilitate rapid data validation by auditors or reviewers. The report highlights any exceptions and outliers to ALS Data Quality Objectives, provides holding time details and exceptions, summarizes QC sample frequencies, and lists applicable methodology references and summaries.

Key

- Anonymous: Refers to samples which are not part of this work order, but which formed part of the QC process lot.
- CAS Number: Chemical Abstracts Service number is a unique identifier assigned to discrete substances.
- DQO: Data Quality Objective.
- LOR: Limit of Reporting (detection limit).
- RPD: Relative Percent Difference.

Workorder Comments

Holding times are displayed as "----" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- Duplicate outliers occur - please see following pages for full details.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

- No Analysis Holding Time Outliers exist.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.



Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Duplicate (DUP) RPDs								
Dissolved Metals	Anonymous	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.0113 ^{DUP-H} %	Diff <2x LOR	Low Level DUP DQO exceeded (difference > 2 LOR).

Result Qualifiers

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.



Analysis Holding Time Compliance

This report summarizes extraction / preparation and analysis times and compares each with ALS recommended holding times, which are selected to meet known provincial and /or federal requirements. In the absence of regulatory hold times, ALS establishes recommendations based on guidelines published by organizations such as CCME, US EPA, APHA Standard Methods, ASTM, or Environment Canada (where available). Dates and holding times reported below represent the first dates of extraction or analysis. If subsequent tests or dilutions exceeded holding times, qualifiers are added (refer to COA).

If samples are identified below as having been analyzed or extracted outside of recommended holding times, measurement uncertainties may be increased, and this should be taken into consideration when interpreting results.

Where actual sampling date is not provided on the chain of custody, the date of receipt with time at 00:00 is used for calculation purposes.

Where only the sample date without time is provided on the chain of custody, the sampling date at 00:00 is used for calculation purposes.

Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) SQU DS 1	E298	06-Feb-2024	07-Feb-2024	28 days	1 days	✔	08-Feb-2024	28 days	2 days	✔	
Anions and Nutrients : Ammonia by Fluorescence											
Amber glass total (sulfuric acid) SQU US 1	E298	06-Feb-2024	07-Feb-2024	28 days	1 days	✔	08-Feb-2024	28 days	2 days	✔	
Anions and Nutrients : Bromide in Water by IC (Low Level)											
HDPE SQU DS 1	E235.Br-L	06-Feb-2024	06-Feb-2024	28 days	0 days	✔	06-Feb-2024	28 days	1 days	✔	
Anions and Nutrients : Bromide in Water by IC (Low Level)											
HDPE SQU US 1	E235.Br-L	06-Feb-2024	06-Feb-2024	28 days	0 days	✔	06-Feb-2024	28 days	1 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE SQU DS 1	E235.Cl	06-Feb-2024	06-Feb-2024	28 days	0 days	✔	06-Feb-2024	28 days	1 days	✔	
Anions and Nutrients : Chloride in Water by IC											
HDPE SQU US 1	E235.Cl	06-Feb-2024	06-Feb-2024	28 days	0 days	✔	06-Feb-2024	28 days	1 days	✔	
Anions and Nutrients : Fluoride in Water by IC											
HDPE SQU DS 1	E235.F	06-Feb-2024	06-Feb-2024	28 days	0 days	✔	06-Feb-2024	28 days	1 days	✔	



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Fluoride in Water by IC										
HDPE SQU US 1	E235.F	06-Feb-2024	06-Feb-2024	28 days	0 days	✓	06-Feb-2024	28 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE SQU DS 1	E235.NO3-L	06-Feb-2024	06-Feb-2024	3 days	0 days	✓	06-Feb-2024	3 days	1 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE SQU US 1	E235.NO3-L	06-Feb-2024	06-Feb-2024	3 days	0 days	✓	06-Feb-2024	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE SQU DS 1	E235.NO2-L	06-Feb-2024	06-Feb-2024	3 days	0 days	✓	06-Feb-2024	3 days	1 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE SQU US 1	E235.NO2-L	06-Feb-2024	06-Feb-2024	3 days	0 days	✓	06-Feb-2024	3 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE SQU DS 1	E235.SO4	06-Feb-2024	06-Feb-2024	28 days	0 days	✓	06-Feb-2024	28 days	1 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE SQU US 1	E235.SO4	06-Feb-2024	06-Feb-2024	28 days	0 days	✓	06-Feb-2024	28 days	1 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) SQU DS 1	E366	06-Feb-2024	07-Feb-2024	28 days	1 days	✓	08-Feb-2024	28 days	2 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) SQU US 1	E366	06-Feb-2024	07-Feb-2024	28 days	1 days	✓	08-Feb-2024	28 days	2 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) SQU DS 1	E372-U	06-Feb-2024	07-Feb-2024	28 days	1 days	✓	08-Feb-2024	28 days	2 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid) SQU US 1	E372-U	06-Feb-2024	07-Feb-2024	28 days	1 days	✓	08-Feb-2024	28 days	2 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial - dissolved (lab preserved) SQU DS 1	E509	06-Feb-2024	07-Feb-2024	28 days	1 days	✓	07-Feb-2024	28 days	1 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial - dissolved (lab preserved) SQU US 1	E509	06-Feb-2024	07-Feb-2024	28 days	1 days	✓	07-Feb-2024	28 days	1 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) SQU DS 1	E421	06-Feb-2024	07-Feb-2024	180 days	1 days	✓	08-Feb-2024	180 days	2 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) SQU US 1	E421	06-Feb-2024	07-Feb-2024	180 days	1 days	✓	08-Feb-2024	180 days	2 days	✓
Field Tests : Field pH,EC,Salinity,Cl2,CIO2,ORP,DO, Turbidity,T,T-P,o-PO4,NH3,Chloramine										
Glass vial - total (lab preserved) SQU DS 1	EF001	06-Feb-2024	----	----	----		07-Feb-2024	----	1 days	
Field Tests : Field pH,EC,Salinity,Cl2,CIO2,ORP,DO, Turbidity,T,T-P,o-PO4,NH3,Chloramine										
Glass vial - total (lab preserved) SQU US 1	EF001	06-Feb-2024	----	----	----		07-Feb-2024	----	1 days	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) SQU DS 1	E358-L	06-Feb-2024	07-Feb-2024	28 days	1 days	✓	07-Feb-2024	28 days	1 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) SQU US 1	E358-L	06-Feb-2024	07-Feb-2024	28 days	1 days	✓	07-Feb-2024	28 days	1 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) SQU DS 1	E355-L	06-Feb-2024	07-Feb-2024	28 days	1 days	✓	07-Feb-2024	28 days	1 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) SQU US 1	E355-L	06-Feb-2024	07-Feb-2024	28 days	1 days	✓	07-Feb-2024	28 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SQU DS 1	E290	06-Feb-2024	06-Feb-2024	14 days	0 days	✓	07-Feb-2024	14 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE SQU US 1	E290	06-Feb-2024	06-Feb-2024	14 days	0 days	✓	07-Feb-2024	14 days	1 days	✓
Physical Tests : TDS by Gravimetry										
HDPE SQU DS 1	E162	06-Feb-2024	----	----	----		08-Feb-2024	7 days	2 days	✓
Physical Tests : TDS by Gravimetry										
HDPE SQU US 1	E162	06-Feb-2024	----	----	----		08-Feb-2024	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE SQU DS 1	E160	06-Feb-2024	----	----	----		08-Feb-2024	7 days	2 days	✓
Physical Tests : TSS by Gravimetry										
HDPE SQU US 1	E160	06-Feb-2024	----	----	----		08-Feb-2024	7 days	2 days	✓



Matrix: **Water** Evaluation: * = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis				
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval	
				Rec	Actual			Rec	Actual		
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC											
UV-inhibited HDPE - dissolved (sodium hydroxide) SQU DS 1	E532A	06-Feb-2024	----	----	----		08-Feb-2024	28 days	2 days	✓	
Speciated Metals : Dissolved Hexavalent Chromium (Cr VI) by IC											
UV-inhibited HDPE - dissolved (sodium hydroxide) SQU US 1	E532A	06-Feb-2024	----	----	----		08-Feb-2024	28 days	2 days	✓	
Speciated Metals : Total Hexavalent Chromium (Cr VI) by IC											
UV-inhibited HDPE - total (sodium hydroxide) SQU DS 1	E532	06-Feb-2024	----	----	----		08-Feb-2024	28 days	2 days	✓	
Speciated Metals : Total Hexavalent Chromium (Cr VI) by IC											
UV-inhibited HDPE - total (sodium hydroxide) SQU US 1	E532	06-Feb-2024	----	----	----		08-Feb-2024	28 days	2 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial - total (lab preserved) SQU DS 1	E508	06-Feb-2024	08-Feb-2024	28 days	2 days	✓	08-Feb-2024	28 days	2 days	✓	
Total Metals : Total Mercury in Water by CVAAS											
Glass vial - total (lab preserved) SQU US 1	E508	06-Feb-2024	08-Feb-2024	28 days	2 days	✓	08-Feb-2024	28 days	2 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE - total (lab preserved) SQU DS 1	E420	06-Feb-2024	08-Feb-2024	180 days	2 days	✓	08-Feb-2024	180 days	2 days	✓	
Total Metals : Total Metals in Water by CRC ICPMS											
HDPE - total (lab preserved) SQU US 1	E420	06-Feb-2024	08-Feb-2024	180 days	2 days	✓	08-Feb-2024	180 days	2 days	✓	
Total Sulfides : Total Sulfide by Colourimetry (Automated Flow)											
HDPE total (zinc acetate+sodium hydroxide) SQU DS 1	E395	06-Feb-2024	----	----	----		12-Feb-2024	7 days	6 days	✓	



Matrix: **Water** Evaluation: ✖ = Holding time exceedance ; ✔ = Within Holding Time

Analyte Group : Analytical Method Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Total Sulfides : Total Sulfide by Colourimetry (Automated Flow)										
HDPE total (zinc acetate+sodium hydroxide) SQU US 1	E395	06-Feb-2024	----	----	----		12-Feb-2024	7 days	6 days	✔

Legend & Qualifier Definitions

Rec. HT: ALS recommended hold time (see units).



Quality Control Parameter Frequency Compliance

The following report summarizes the frequency of laboratory QC samples analyzed within the analytical batches (QC lots) in which the submitted samples were processed. The actual frequency should be greater than or equal to the expected frequency.

Matrix: **Water** Evaluation: * = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
Analytical Methods							
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	1324725	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	1325571	1	12	8.3	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	1324729	1	14	7.1	5.0	✓
Chloride in Water by IC	E235.Cl	1324728	1	20	5.0	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	1326126	1	8	12.5	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1325477	1	18	5.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1324879	2	20	10.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1325567	1	8	12.5	5.0	✓
Fluoride in Water by IC	E235.F	1324727	1	14	7.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1324730	1	14	7.1	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1324731	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	1324732	1	14	7.1	5.0	✓
TDS by Gravimetry	E162	1327082	1	17	5.8	5.0	✓
Total Hexavalent Chromium (Cr VI) by IC	E532	1326128	1	10	10.0	5.0	✓
Total Mercury in Water by CVAAS	E508	1326779	2	39	5.1	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1324708	2	20	10.0	5.0	✓
Total Nitrogen by Colourimetry	E366	1325569	1	12	8.3	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1325568	1	12	8.3	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1325570	1	10	10.0	5.0	✓
Total Sulfide by Colourimetry (Automated Flow)	E395	1330613	1	16	6.2	5.0	✓
TSS by Gravimetry	E160	1327071	1	17	5.8	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	1324725	1	14	7.1	5.0	✓
Ammonia by Fluorescence	E298	1325571	1	12	8.3	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	1324729	1	14	7.1	5.0	✓
Chloride in Water by IC	E235.Cl	1324728	1	20	5.0	5.0	✓
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	1326126	1	8	12.5	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1325477	1	18	5.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1324879	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1325567	1	8	12.5	5.0	✓
Fluoride in Water by IC	E235.F	1324727	1	14	7.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1324730	1	14	7.1	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1324731	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	1324732	1	14	7.1	5.0	✓
TDS by Gravimetry	E162	1327082	1	17	5.8	5.0	✓
Total Hexavalent Chromium (Cr VI) by IC	E532	1326128	1	10	10.0	5.0	✓



Matrix: **Water**

Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
Analytical Methods							
Laboratory Control Samples (LCS) - Continued							
Total Mercury in Water by CVAAS	E508	1326779	2	39	5.1	5.0	✔
Total Metals in Water by CRC ICPMS	E420	1324708	1	20	5.0	5.0	✔
Total Nitrogen by Colourimetry	E366	1325569	1	12	8.3	5.0	✔
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1325568	1	12	8.3	5.0	✔
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1325570	1	10	10.0	5.0	✔
Total Sulfide by Colourimetry (Automated Flow)	E395	1330613	1	16	6.2	5.0	✔
TSS by Gravimetry	E160	1327071	1	17	5.8	5.0	✔
Method Blanks (MB)							
Alkalinity Species by Titration	E290	1324725	1	14	7.1	5.0	✔
Ammonia by Fluorescence	E298	1325571	1	12	8.3	5.0	✔
Bromide in Water by IC (Low Level)	E235.Br-L	1324729	1	14	7.1	5.0	✔
Chloride in Water by IC	E235.Cl	1324728	1	20	5.0	5.0	✔
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	1326126	1	8	12.5	5.0	✔
Dissolved Mercury in Water by CVAAS	E509	1325477	1	18	5.5	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	1324879	2	20	10.0	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1325567	1	8	12.5	5.0	✔
Fluoride in Water by IC	E235.F	1324727	1	14	7.1	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	1324730	1	14	7.1	5.0	✔
Nitrite in Water by IC (Low Level)	E235.NO2-L	1324731	1	14	7.1	5.0	✔
Sulfate in Water by IC	E235.SO4	1324732	1	14	7.1	5.0	✔
TDS by Gravimetry	E162	1327082	1	17	5.8	5.0	✔
Total Hexavalent Chromium (Cr VI) by IC	E532	1326128	1	10	10.0	5.0	✔
Total Mercury in Water by CVAAS	E508	1326779	2	39	5.1	5.0	✔
Total Metals in Water by CRC ICPMS	E420	1324708	1	20	5.0	5.0	✔
Total Nitrogen by Colourimetry	E366	1325569	1	12	8.3	5.0	✔
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1325568	1	12	8.3	5.0	✔
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1325570	1	10	10.0	5.0	✔
Total Sulfide by Colourimetry (Automated Flow)	E395	1330613	1	16	6.2	5.0	✔
TSS by Gravimetry	E160	1327071	1	17	5.8	5.0	✔
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	1325571	1	12	8.3	5.0	✔
Bromide in Water by IC (Low Level)	E235.Br-L	1324729	1	14	7.1	5.0	✔
Chloride in Water by IC	E235.Cl	1324728	1	20	5.0	5.0	✔
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A	1326126	1	8	12.5	5.0	✔
Dissolved Mercury in Water by CVAAS	E509	1325477	1	18	5.5	5.0	✔
Dissolved Metals in Water by CRC ICPMS	E421	1324879	2	20	10.0	5.0	✔
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1325567	1	8	12.5	5.0	✔
Fluoride in Water by IC	E235.F	1324727	1	14	7.1	5.0	✔
Nitrate in Water by IC (Low Level)	E235.NO3-L	1324730	1	14	7.1	5.0	✔



Matrix: **Water** Evaluation: ✖ = QC frequency outside specification; ✔ = QC frequency within specification.

Quality Control Sample Type	Method	QC Lot #	Count		Frequency (%)		
			QC	Regular	Actual	Expected	Evaluation
<i>Analytical Methods</i>							
Matrix Spikes (MS) - Continued							
Nitrite in Water by IC (Low Level)	E235.NO2-L	1324731	1	14	7.1	5.0	✔
Sulfate in Water by IC	E235.SO4	1324732	1	14	7.1	5.0	✔
Total Hexavalent Chromium (Cr VI) by IC	E532	1326128	1	10	10.0	5.0	✔
Total Mercury in Water by CVAAS	E508	1326779	2	39	5.1	5.0	✔
Total Metals in Water by CRC ICPMS	E420	1324708	1	20	5.0	5.0	✔
Total Nitrogen by Colourimetry	E366	1325569	1	12	8.3	5.0	✔
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1325568	1	12	8.3	5.0	✔
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1325570	1	10	10.0	5.0	✔
Total Sulfide by Colourimetry (Automated Flow)	E395	1330613	1	16	6.2	5.0	✔



Methodology References and Summaries

The analytical methods used by ALS are developed using internationally recognized reference methods (where available), such as those published by US EPA, APHA Standard Methods, ASTM, ISO, Environment Canada, BC MOE, and Ontario MOE. Reference methods may incorporate modifications to improve performance (indicated by "mod").

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
TSS by Gravimetry	E160 ALS Environmental - Vancouver	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at $104 \pm 1^\circ\text{C}$, with gravimetric measurement of the filtered solids. 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.
TDS by Gravimetry	E162 ALS Environmental - Vancouver	Water	APHA 2540 C (mod)	Total Dissolved Solids (TDS) are determined by filtering a sample through a glass fibre filter, with evaporation of the filtrate at $180 \pm 2^\circ\text{C}$ for 16 hours or to constant weight, with gravimetric measurement of the residue.
Bromide in Water by IC (Low Level)	E235.Br-L ALS Environmental - Vancouver	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Chloride in Water by IC	E235.Cl ALS Environmental - Vancouver	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Fluoride in Water by IC	E235.F ALS Environmental - Vancouver	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrite in Water by IC (Low Level)	E235.NO2-L ALS Environmental - Vancouver	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Nitrate in Water by IC (Low Level)	E235.NO3-L ALS Environmental - Vancouver	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Sulfate in Water by IC	E235.SO4 ALS Environmental - Vancouver	Water	EPA 300.1 (mod)	Inorganic anions are analyzed by Ion Chromatography with conductivity and/or UV detection.
Alkalinity Species by Titration	E290 ALS Environmental - Vancouver	Water	APHA 2320 B (mod)	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.



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Ammonia by Fluorescence	E298 ALS Environmental - Vancouver	Water	Method Fialab 100, 2018	Ammonia in water is determined by automated continuous flow analysis with membrane diffusion and fluorescence detection, after reaction with OPA (ortho-phthalaldehyde). This method is approved under US EPA 40 CFR Part 136 (May 2021)
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L ALS Environmental - Vancouver	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L ALS Environmental - Vancouver	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO ₂ . NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Nitrogen by Colourimetry	E366 ALS Environmental - Vancouver	Water	Chinchilla Scientific Nitrate Method, 2011	Following digestion, total nitrogen is determined colourimetrically using a discrete analyzer utilizing the vanadium chloride reduction method. This method of analysis is approved under US EPA 40 CFR Part 136 (May 2021).
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Total Phosphorus is determined colourimetrically using a discrete analyzer after heated persulfate digestion of the sample.
Total Sulfide by Colourimetry (Automated Flow)	E395 ALS Environmental - Vancouver	Water	APHA 4500 -S E-Auto-Colorimetry	Sulfide is determined using the gas dialysis automated methylene blue colourimetric method. Results expressed "as H ₂ S" if reported represent the maximum possible H ₂ S concentration based on the total sulfide concentration in the sample. The H ₂ S calculation converts Total Sulphide as (S ₂ -) and reports it as Total Sulphide as (H ₂ S)
Total Metals in Water by CRC ICPMS	E420 ALS Environmental - Vancouver	Water	EPA 200.2/6020B (mod)	Water samples are digested with nitric and hydrochloric acids, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Dissolved Metals in Water by CRC ICPMS	E421 ALS Environmental - Vancouver	Water	APHA 3030B/EPA 6020B (mod)	Water samples are filtered (0.45 um), preserved with nitric acid, and analyzed by Collision/Reaction Cell ICPMS. Method Limitation (re: Sulfur): Sulfide and volatile sulfur species may not be recovered by this method.
Total Mercury in Water by CVAAS	E508 ALS Environmental - Vancouver	Water	EPA 1631E (mod)	Water samples undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS



Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Dissolved Mercury in Water by CVAAS	E509 ALS Environmental - Vancouver	Water	APHA 3030B/EPA 1631E (mod)	Water samples are filtered (0.45 um), preserved with HCl, then undergo a cold-oxidation using bromine monochloride prior to reduction with stannous chloride, and analyzed by CVAAS.
Total Hexavalent Chromium (Cr VI) by IC	E532 ALS Environmental - Vancouver	Water	APHA 3500-Cr C (Ion Chromatography)	Hexavalent Chromium is measured by Ion chromatography-Post column reaction and UV detection. Results are based on an un-filtered, field-preserved sample.
Dissolved Hexavalent Chromium (Cr VI) by IC	E532A ALS Environmental - Vancouver	Water	APHA 3500-Cr C (Ion Chromatography)	Hexavalent Chromium is measured by Ion chromatography-Post column reaction and UV detection. sample pretreatment involved field or lab filtration following by sample preservation.
Dissolved Hardness (Calculated)	EC100 ALS Environmental - Vancouver	Water	APHA 2340B	"Hardness (as CaCO ₃), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Hardness (Calculated) from Total Ca/Mg	EC100A ALS Environmental - Vancouver	Water	APHA 2340B	"Hardness (as CaCO ₃), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO ₃ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
Un-ionized Total Hydrogen Sulfide (calculated)	EC395 ALS Environmental - Vancouver	Water	APHA 4500 -S H	Un-ionized sulfide is calculated using results from total sulfide analysis, pH, temperature, and ionic strength of the sample. Calculation of un-ionized sulfide using total sulfide concentrations may be biased high due to particulate forms of sulfide measured during total sulfide testing.
Total Trivalent Chromium (Cr III) by Calculation	EC535 ALS Environmental - Vancouver	Water	APHA 3030B/6020A/EPA 7196A (mod)	Chromium (III)-Total is calculated as the difference between the total chromium and the total hexavalent chromium (Cr(VI)) results. The Limit of Reporting for Chromium (III) varies as a function of the test results.
Dissolved Trivalent Chromium (Cr III) by Calculation	EC535A ALS Environmental - Vancouver	Water	APHA 3030B/6020A/EPA 7196A (mod)	Dissolved Chromium (III) is calculated as the difference between Dissolved Chromium and Dissolved Hexavalent Chromium (Cr VI) results. The Limit of Reporting for Chromium (III) varies as a function of the test results.
Field pH,EC,Salinity,Cl ₂ ,ClO ₂ ,ORP,DO, Turbidity,T,T-P,o-PO ₄ ,NH ₃ ,Chloramine	EF001 ALS Environmental - Vancouver	Water	Field Measurement (Client Supplied)	Field pH,EC,Salinity,Cl ₂ ,ClO ₂ ,ORP,DO, Turbidity,T,T-P,o-PO ₄ ,NH ₃ or Chloramine measurements provided by client and recorded on ALS report may affect the validity of results.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Ammonia	EP298 ALS Environmental - Vancouver	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.



<i>Preparation Methods</i>	<i>Method / Lab</i>	<i>Matrix</i>	<i>Method Reference</i>	<i>Method Descriptions</i>
Preparation for Total Organic Carbon by Combustion	EP355 ALS Environmental - Vancouver	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 ALS Environmental - Vancouver	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Digestion for Total Nitrogen in water	EP366 ALS Environmental - Vancouver	Water	APHA 4500-P J (mod)	Samples for total nitrogen analysis are digested using a heated persulfate digestion. Nitrogen compounds are converted to nitrate in this digestion.
Digestion for Total Phosphorus in water	EP372 ALS Environmental - Vancouver	Water	APHA 4500-P E (mod).	Samples are heated with a persulfate digestion reagent.
Dissolved Metals Water Filtration	EP421 ALS Environmental - Vancouver	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.
Dissolved Mercury Water Filtration	EP509 ALS Environmental - Vancouver	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.

QUALITY CONTROL REPORT

<p>Work Order : VA24A2292</p> <p>Client : Triton Environmental Consultants Ltd.</p> <p>Contact : Miranda Lewis</p> <p>Address : Suite 1730, 1111 West Georgia St Vancouver BC Canada V6E 4M3</p> <p>Telephone :</p> <p>Project : 11964</p> <p>PO : 11964 - Task 20 - Phase 3C-4C</p> <p>C-O-C number : ----</p> <p>Sampler : ---- 604 631 2213</p> <p>Site : Water Analysis</p> <p>Quote number : VA23-TRIT100-012</p> <p>No. of samples received : 2</p> <p>No. of samples analysed : 2</p>	<p>Page : 1 of 18</p> <p>Laboratory : ALS Environmental - Vancouver</p> <p>Account Manager : Can Dang</p> <p>Address : 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9</p> <p>Telephone : +1 604 253 4188</p> <p>Date Samples Received : 06-Feb-2024 16:00</p> <p>Date Analysis Commenced : 06-Feb-2024</p> <p>Issue Date : 13-Feb-2024 14:58</p>
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This report supersedes any previous report(s) with this reference. Results apply to the sample(s) as submitted. This document shall not be reproduced, except in full.

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- Matrix Spike (MS) Report; Recovery and Data Quality Objectives
- Method Blank (MB) Report; Recovery and Data Quality Objectives
- Laboratory Control Sample (LCS) Report; Recovery and Data Quality Objectives

Signatories

This document has been electronically signed by the authorized signatories below. Electronic signing is conducted in accordance with US FDA 21 CFR Part 11.

<i>Signatories</i>	<i>Position</i>	<i>Laboratory Department</i>
Angelo Salandanan	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
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Paolo Obillo	Account Manager Assistant	Vancouver Administration, Burnaby, British Columbia
Sam Silveira	Lab Assistant	Vancouver Metals, Burnaby, British Columbia



General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include 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 predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

Anonymous = Refers to samples which are not part of this work order, but which formed part of the QC process lot.

CAS Number = Chemical Abstracts Service number is a unique identifier assigned to discrete substances.

DQO = Data Quality Objective.

LOR = Limit of Reporting (detection limit).

RPD = Relative Percent Difference

= Indicates a QC result that did not meet the ALS DQO.

Workorder Comments

Holding times are displayed as "--" if no guidance exists from CCME, Canadian provinces, or broadly recognized international references.



Laboratory Duplicate (DUP) Report

A Laboratory Duplicate (DUP) is a randomly selected intralaboratory replicate sample. Laboratory Duplicates provide information regarding method precision and sample heterogeneity. ALS DQOs for Laboratory Duplicates are expressed as test-specific limits for Relative Percent Difference (RPD), or as an absolute difference limit of 2 times the LOR for low concentration duplicates within ~ 4-10 times the LOR (cut-off is test-specific).

Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 1324725)											
VA24A2224-003	Anonymous	Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	212	210	0.521%	20%	----
Physical Tests (QC Lot: 1327071)											
FJ2400300-001	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	4.1	<3.0	1.1	Diff <2x LOR	----
Physical Tests (QC Lot: 1327082)											
FJ2400300-001	Anonymous	Solids, total dissolved [TDS]	----	E162	20	mg/L	231	218	5.57%	20%	----
Anions and Nutrients (QC Lot: 1324727)											
VA24A2224-001	Anonymous	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.100	0.098	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1324728)											
VA24A2224-001	Anonymous	Chloride	16887-00-6	E235.Cl	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1324729)											
VA24A2224-001	Anonymous	Bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1324730)											
VA24A2224-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.227	0.227	0.0872%	20%	----
Anions and Nutrients (QC Lot: 1324731)											
VA24A2224-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1324732)											
VA24A2224-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	100	100	0.330%	20%	----
Anions and Nutrients (QC Lot: 1325569)											
VA24A2107-001	Anonymous	Nitrogen, total	7727-37-9	E366	0.030	mg/L	0.121	0.125	0.004	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1325570)											
VA24A2107-001	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0253	0.0253	0.158%	20%	----
Anions and Nutrients (QC Lot: 1325571)											
VA24A2107-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0312	0.0298	0.0013	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 1325567)											
VA24A2107-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	2.96	2.81	0.15	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 1325568)											
VA24A2107-001	Anonymous	Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	2.88	2.88	0.002	Diff <2x LOR	----
Total Sulfides (QC Lot: 1330613)											
CG2401561-001	Anonymous	Sulfide, total (as S)	18496-25-8	E395	0.0015	mg/L	0.152	0.155	2.29%	20%	----
Total Metals (QC Lot: 1324708)											



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 1324708) - continued											
VA24A2298-001	Anonymous	Boron, total	7440-42-8	E420	0.010	mg/L	2.01	2.02	0.470%	20%	----
VA24A2298-001	Anonymous	Aluminum, total	7429-90-5	E420	0.0030	mg/L	1.26	1.31	4.09%	20%	----
		Antimony, total	7440-36-0	E420	0.00010	mg/L	0.00380	0.00367	3.46%	20%	----
		Arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00149	0.00149	0.330%	20%	----
		Barium, total	7440-39-3	E420	0.00010	mg/L	0.146	0.144	1.41%	20%	----
		Beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Bismuth, total	7440-69-9	E420	0.000050	mg/L	0.000153	0.000149	0.000003	Diff <2x LOR	----
		Cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.000387	0.000396	2.22%	20%	----
		Calcium, total	7440-70-2	E420	0.050	mg/L	62.0	60.7	2.08%	20%	----
		Cesium, total	7440-46-2	E420	0.000010	mg/L	0.000498	0.000486	2.45%	20%	----
		Chromium, total	7440-47-3	E420	0.00050	mg/L	0.00309	0.00314	0.00005	Diff <2x LOR	----
		Cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00420	0.00412	1.95%	20%	----
		Copper, total	7440-50-8	E420	0.00050	mg/L	0.0198	0.0196	0.868%	20%	----
		Iron, total	7439-89-6	E420	0.010	mg/L	10.4	10.8	3.89%	20%	----
		Lead, total	7439-92-1	E420	0.000050	mg/L	0.0131	0.0130	0.596%	20%	----
		Lithium, total	7439-93-2	E420	0.0010	mg/L	0.0505	0.0502	0.576%	20%	----
		Magnesium, total	7439-95-4	E420	0.0050	mg/L	7.91	7.88	0.359%	20%	----
		Manganese, total	7439-96-5	E420	0.00010	mg/L	1.38	1.36	2.02%	20%	----
		Molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.0367	0.0360	2.13%	20%	----
		Nickel, total	7440-02-0	E420	0.00050	mg/L	0.0294	0.0292	0.610%	20%	----
		Phosphorus, total	7723-14-0	E420	0.050	mg/L	0.192	0.209	0.017	Diff <2x LOR	----
		Potassium, total	7440-09-7	E420	0.050	mg/L	12.8	13.2	2.84%	20%	----
		Rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00882	0.00886	0.431%	20%	----
		Selenium, total	7782-49-2	E420	0.000050	mg/L	0.000142	0.000140	0.000002	Diff <2x LOR	----
		Silicon, total	7440-21-3	E420	0.10	mg/L	5.80	6.52	11.8%	20%	----
		Silver, total	7440-22-4	E420	0.000010	mg/L	0.000040	0.000041	0.0000006	Diff <2x LOR	----
		Sodium, total	7440-23-5	E420	0.050	mg/L	62.3	62.7	0.703%	20%	----
		Strontium, total	7440-24-6	E420	0.00020	mg/L	0.438	0.430	1.97%	20%	----
		Sulfur, total	7704-34-9	E420	0.50	mg/L	12.7	13.4	4.97%	20%	----
		Tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Tin, total	7440-31-5	E420	0.00010	mg/L	0.00108	0.00111	2.41%	20%	----
		Titanium, total	7440-32-6	E420	0.00030	mg/L	0.0495	0.0516	4.12%	20%	----



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 1324708) - continued											
VA24A2298-001	Anonymous	Tungsten, total	7440-33-7	E420	0.00010	mg/L	0.00024	0.00024	0.000006	Diff <2x LOR	----
		Uranium, total	7440-61-1	E420	0.000010	mg/L	0.000162	0.000167	3.26%	20%	----
		Vanadium, total	7440-62-2	E420	0.00050	mg/L	0.00215	0.00231	0.00016	Diff <2x LOR	----
		Zinc, total	7440-66-6	E420	0.0030	mg/L	1.16	1.14	1.53%	20%	----
		Zirconium, total	7440-67-7	E420	0.00020	mg/L	0.00043	0.00047	0.00004	Diff <2x LOR	----
Total Metals (QC Lot: 1326779)											
FJ2400296-026	Anonymous	Mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Total Metals (QC Lot: 1326780)											
VA24A2292-002	SQU US 1	Mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 1324879)											
VA24A2289-001	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.0050	mg/L	0.0058	# 0.0172	0.0113	Diff <2x LOR	DUP-H
		Manganese, dissolved	7439-96-5	E421	0.00050	mg/L	0.00095	0.00136	0.00041	Diff <2x LOR	----
VA24A2289-001	Anonymous	Antimony, dissolved	7440-36-0	E421	0.00050	mg/L	0.00131	0.00128	0.00003	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00050	mg/L	0.00642	0.00665	3.39%	20%	----
		Barium, dissolved	7440-39-3	E421	0.00050	mg/L	0.0153	0.0158	3.43%	20%	----
		Beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Bismuth, dissolved	7440-69-9	E421	0.000250	mg/L	<0.000250	<0.000250	0	Diff <2x LOR	----
		Boron, dissolved	7440-42-8	E421	0.050	mg/L	0.662	0.630	4.96%	20%	----
		Cadmium, dissolved	7440-43-9	E421	0.0000250	mg/L	0.0000591	0.0000826	0.0000235	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.250	mg/L	169	163	3.30%	20%	----
		Cesium, dissolved	7440-46-2	E421	0.000050	mg/L	0.000183	0.000176	0.000007	Diff <2x LOR	----
		Chromium, dissolved	7440-47-3	E421	0.00250	mg/L	<0.00250	<0.00250	0	Diff <2x LOR	----
		Cobalt, dissolved	7440-48-4	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00100	mg/L	0.0529	0.0546	3.08%	20%	----
		Iron, dissolved	7439-89-6	E421	0.050	mg/L	<0.050	0.052	0.002	Diff <2x LOR	----
		Lead, dissolved	7439-92-1	E421	0.000250	mg/L	<0.000250	<0.000250	0	Diff <2x LOR	----
		Lithium, dissolved	7439-93-2	E421	0.0050	mg/L	0.0165	0.0167	0.0002	Diff <2x LOR	----
		Magnesium, dissolved	7439-95-4	E421	0.0250	mg/L	373	370	0.716%	20%	----
		Molybdenum, dissolved	7439-98-7	E421	0.000250	mg/L	0.0956	0.0939	1.75%	20%	----
		Nickel, dissolved	7440-02-0	E421	0.00250	mg/L	0.00304	0.00312	0.00008	Diff <2x LOR	----
		Phosphorus, dissolved	7723-14-0	E421	0.250	mg/L	<0.250	<0.250	0	Diff <2x LOR	----
		Potassium, dissolved	7440-09-7	E421	0.250	mg/L	20.1	20.1	0.114%	20%	----
		Rubidium, dissolved	7440-17-7	E421	0.00100	mg/L	0.00605	0.00639	0.00034	Diff <2x LOR	----
		Selenium, dissolved	7782-49-2	E421	0.000250	mg/L	0.182	0.178	2.63%	20%	----



Sub-Matrix: Water					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 1324879) - continued											
VA24A2289-001	Anonymous	Silicon, dissolved	7440-21-3	E421	0.250	mg/L	5.61	5.56	1.00%	20%	----
		Silver, dissolved	7440-22-4	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Sodium, dissolved	7440-23-5	E421	0.250	mg/L	922	909	1.36%	20%	----
		Strontium, dissolved	7440-24-6	E421	0.00100	mg/L	5.59	5.46	2.27%	20%	----
		Sulfur, dissolved	7704-34-9	E421	2.50	mg/L	1180	1160	1.63%	20%	----
		Tellurium, dissolved	13494-80-9	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Thallium, dissolved	7440-28-0	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Thorium, dissolved	7440-29-1	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Tin, dissolved	7440-31-5	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Titanium, dissolved	7440-32-6	E421	0.00150	mg/L	<0.00150	<0.00150	0	Diff <2x LOR	----
		Tungsten, dissolved	7440-33-7	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Uranium, dissolved	7440-61-1	E421	0.000050	mg/L	0.00701	0.00677	3.49%	20%	----
		Vanadium, dissolved	7440-62-2	E421	0.00250	mg/L	<0.00250	<0.00250	0	Diff <2x LOR	----
		Zinc, dissolved	7440-66-6	E421	0.0050	mg/L	<0.0050	0.0071	0.0021	Diff <2x LOR	----
		Zirconium, dissolved	7440-67-7	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 1325477)											
VA24A2225-010	Anonymous	Mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 1326126)											
VA24A2133-001	Anonymous	Chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0500	mg/L	<50.0 µg/L	<0.0500	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 1326128)											
VA24A2292-001	SQU DS 1	Chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----

Qualifiers

Qualifier	Description
DUP-H	Duplicate results outside ALS DQO, due to sample heterogeneity.



Method Blank (MB) Report

A Method Blank is an analyte-free matrix that undergoes sample processing identical to that carried out for test samples. Method Blank results are used to monitor and control for potential contamination from the laboratory environment and reagents. For most tests, the DQO for Method Blanks is for the result to be < LOR.

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Physical Tests (QCLot: 1324725)						
Alkalinity, total (as CaCO3)	---	E290	1	mg/L	1.3	---
Physical Tests (QCLot: 1327071)						
Solids, total suspended [TSS]	---	E160	3	mg/L	<3.0	---
Physical Tests (QCLot: 1327082)						
Solids, total dissolved [TDS]	---	E162	10	mg/L	<10	---
Anions and Nutrients (QCLot: 1324727)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	---
Anions and Nutrients (QCLot: 1324728)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	---
Anions and Nutrients (QCLot: 1324729)						
Bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	---
Anions and Nutrients (QCLot: 1324730)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	---
Anions and Nutrients (QCLot: 1324731)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	---
Anions and Nutrients (QCLot: 1324732)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	---
Anions and Nutrients (QCLot: 1325569)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	---
Anions and Nutrients (QCLot: 1325570)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	---
Anions and Nutrients (QCLot: 1325571)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	---
Organic / Inorganic Carbon (QCLot: 1325567)						
Carbon, dissolved organic [DOC]	---	E358-L	0.5	mg/L	<0.50	---
Organic / Inorganic Carbon (QCLot: 1325568)						
Carbon, total organic [TOC]	---	E355-L	0.5	mg/L	<0.50	---
Total Sulfides (QCLot: 1330613)						
Sulfide, total (as S)	18496-25-8	E395	0.0015	mg/L	<0.0015	---
Total Metals (QCLot: 1324708)						
Aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	---
Antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	---



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 1324708) - continued						
Arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
Barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
Boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
Calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
Copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
Iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
Lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
Lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
Potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
Silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
Silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
Sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
Tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 1324708) - continued						
Zinc, total	7440-66-6	E420	0.003	mg/L	<0.0030	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	<0.00020	----
Total Metals (QCLot: 1326779)						
Mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Total Metals (QCLot: 1326780)						
Mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 1324879)						
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	<0.0010	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	<0.00010	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	<0.00010	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	<0.00010	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	<0.000020	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	<0.000050	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	<0.010	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	<0.0000050	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	<0.050	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	<0.000010	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	<0.00050	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	<0.00010	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	<0.00020	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	<0.010	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	<0.000050	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	<0.0010	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	<0.0050	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	<0.00010	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	<0.000050	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	<0.00050	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	<0.050	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	<0.050	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	<0.00020	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	<0.000050	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	<0.050	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	<0.000010	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	<0.050	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	<0.00020	----



Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 1324879) - continued						
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	<0.000010	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	<0.00010	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	<0.00010	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	<0.00030	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	<0.00010	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	<0.000010	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	<0.00050	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	<0.0010	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	<0.00020	----
Dissolved Metals (QCLot: 1325477)						
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Speciated Metals (QCLot: 1326126)						
Chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	<0.00050	----
Speciated Metals (QCLot: 1326128)						
Chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.0005	mg/L	<0.00050	----



Laboratory Control Sample (LCS) Report

A Laboratory Control Sample (LCS) is an analyte-free matrix that has been fortified (spiked) with test analytes at known concentration and processed in an identical manner to test samples. LCS results are expressed as percent recovery, and are used to monitor and control test method accuracy and precision, independent of test sample matrix.

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Physical Tests (QCLot: 1324725)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	109	85.0	115	----
Physical Tests (QCLot: 1327071)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	89.8	85.0	115	----
Physical Tests (QCLot: 1327082)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	95.0	85.0	115	----
Anions and Nutrients (QCLot: 1324727)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	97.6	90.0	110	----
Anions and Nutrients (QCLot: 1324728)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 1324729)									
Bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	99.2	85.0	115	----
Anions and Nutrients (QCLot: 1324730)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 1324731)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	97.5	90.0	110	----
Anions and Nutrients (QCLot: 1324732)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 1325569)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	99.1	75.0	125	----
Anions and Nutrients (QCLot: 1325570)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	88.8	80.0	120	----
Anions and Nutrients (QCLot: 1325571)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	89.4	85.0	115	----
Organic / Inorganic Carbon (QCLot: 1325567)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	100	80.0	120	----
Organic / Inorganic Carbon (QCLot: 1325568)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	103	80.0	120	----
Total Sulfides (QCLot: 1330613)									
Sulfide, total (as S)	18496-25-8	E395	0.0015	mg/L	0.08 mg/L	103	80.0	120	----



Sub-Matrix: **Water**

Laboratory Control Sample (LCS) Report

Analyte	CAS Number	Method	LOR	Unit	Spike	Recovery (%)	Recovery Limits (%)		Qualifier
					Concentration	LCS	Low	High	
Total Metals (QCLot: 1324708)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	101	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	101	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	105	80.0	120	----
Barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	100	80.0	120	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	102	80.0	120	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	99.7	80.0	120	----
Boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	86.4	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	99.7	80.0	120	----
Calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	100	80.0	120	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	97.1	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	99.1	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	96.5	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	96.5	80.0	120	----
Iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	97.5	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	99.0	80.0	120	----
Lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	96.9	80.0	120	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	103	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	99.2	80.0	120	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	101	80.0	120	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	98.3	80.0	120	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	115	80.0	120	----
Potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	100	80.0	120	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	103	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	100	80.0	120	----
Silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	104	80.0	120	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	94.2	80.0	120	----
Sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	98.6	80.0	120	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	97.2	80.0	120	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	84.4	80.0	120	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	99.7	80.0	120	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	98.3	80.0	120	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	94.1	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	101	80.0	120	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	97.2	80.0	120	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	101	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 1324708) - continued									
Uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	101	80.0	120	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	100	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	99.0	80.0	120	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	98.9	80.0	120	----
Total Metals (QCLot: 1326779)									
Mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	98.7	80.0	120	----
Total Metals (QCLot: 1326780)									
Mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	101	80.0	120	----
Dissolved Metals (QCLot: 1324879)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	108	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	101	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	106	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	103	80.0	120	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	98.6	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	97.5	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	102	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	100	80.0	120	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	102	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	103	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	103	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	102	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	103	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	102	80.0	120	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	104	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	103	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	105	80.0	120	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	101	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	102	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	104	80.0	120	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	101	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	100	80.0	120	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	106	80.0	120	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	98.1	80.0	120	----



Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 1324879) - continued									
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	104	80.0	120	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	102	80.0	120	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	107	80.0	120	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	100	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	99.3	80.0	120	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	99.6	80.0	120	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	102	80.0	120	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	102	80.0	120	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	103	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	106	80.0	120	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	105	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	103	80.0	120	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	90.1	80.0	120	----
Speciated Metals (QCLot: 1326126)									
Chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	0.0005	mg/L	0.25 mg/L	105	80.0	120	----
Speciated Metals (QCLot: 1326128)									
Chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.0005	mg/L	0.25 mg/L	104	80.0	120	----



Matrix Spike (MS) Report

A Matrix Spike (MS) is a randomly selected intra-laboratory replicate sample that has been fortified (spiked) with test analytes at known concentration, and processed in an identical manner to test samples. Matrix Spikes provide information regarding analyte recovery and potential matrix effects. MS DQO exceedances due to sample matrix may sometimes be unavoidable; in such cases, test results for the associated sample (or similar samples) may be subject to bias. ND – Recovery not determined, background level >= 1x spike level.

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 1324727)										
VA24A2224-002	Anonymous	Fluoride	16984-48-8	E235.F	0.891 mg/L	1 mg/L	89.1	75.0	125	----
Anions and Nutrients (QCLot: 1324728)										
VA24A2224-002	Anonymous	Chloride	16887-00-6	E235.Cl	94.5 mg/L	100 mg/L	94.5	75.0	125	----
Anions and Nutrients (QCLot: 1324729)										
VA24A2224-002	Anonymous	Bromide	24959-67-9	E235.Br-L	0.460 mg/L	0.5 mg/L	92.1	75.0	125	----
Anions and Nutrients (QCLot: 1324730)										
VA24A2224-002	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	2.36 mg/L	2.5 mg/L	94.5	75.0	125	----
Anions and Nutrients (QCLot: 1324731)										
VA24A2224-002	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.431 mg/L	0.5 mg/L	86.2	75.0	125	----
Anions and Nutrients (QCLot: 1324732)										
VA24A2224-002	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	100 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 1325569)										
VA24A2107-002	Anonymous	Nitrogen, total	7727-37-9	E366	0.400 mg/L	0.4 mg/L	100	70.0	130	----
Anions and Nutrients (QCLot: 1325570)										
VA24A2107-002	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0464 mg/L	0.05 mg/L	92.8	70.0	130	----
Anions and Nutrients (QCLot: 1325571)										
VA24A2107-002	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0943 mg/L	0.1 mg/L	94.3	75.0	125	----
Organic / Inorganic Carbon (QCLot: 1325567)										
VA24A2107-002	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	4.86 mg/L	5 mg/L	97.1	70.0	130	----
Organic / Inorganic Carbon (QCLot: 1325568)										
VA24A2107-002	Anonymous	Carbon, total organic [TOC]	----	E355-L	5.34 mg/L	5 mg/L	107	70.0	130	----
Total Sulfides (QCLot: 1330613)										
CG2401561-002	Anonymous	Sulfide, total (as S)	18496-25-8	E395	0.209 mg/L	0.2 mg/L	105	75.0	125	----
Total Metals (QCLot: 1324708)										
VA24A2298-002	Anonymous	Aluminum, total	7429-90-5	E420	0.186 mg/L	0.2 mg/L	93.1	70.0	130	----
		Antimony, total	7440-36-0	E420	0.0190 mg/L	0.02 mg/L	95.2	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.0192 mg/L	0.02 mg/L	96.1	70.0	130	----
		Barium, total	7440-39-3	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 1324708) - continued										
VA24A2298-002	Anonymous	Beryllium, total	7440-41-7	E420	0.0370 mg/L	0.04 mg/L	92.5	70.0	130	----
		Bismuth, total	7440-69-9	E420	0.00916 mg/L	0.01 mg/L	91.6	70.0	130	----
		Boron, total	7440-42-8	E420	ND mg/L	0.1 mg/L	ND	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.00372 mg/L	0.004 mg/L	92.9	70.0	130	----
		Calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		Cesium, total	7440-46-2	E420	0.00920 mg/L	0.01 mg/L	92.0	70.0	130	----
		Chromium, total	7440-47-3	E420	0.0368 mg/L	0.04 mg/L	91.9	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.0178 mg/L	0.02 mg/L	88.9	70.0	130	----
		Copper, total	7440-50-8	E420	0.0171 mg/L	0.02 mg/L	85.4	70.0	130	----
		Iron, total	7439-89-6	E420	1.79 mg/L	2 mg/L	89.7	70.0	130	----
		Lead, total	7439-92-1	E420	0.0183 mg/L	0.02 mg/L	91.4	70.0	130	----
		Lithium, total	7439-93-2	E420	0.0864 mg/L	0.1 mg/L	86.4	70.0	130	----
		Magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		Manganese, total	7439-96-5	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Molybdenum, total	7439-98-7	E420	0.0189 mg/L	0.02 mg/L	94.7	70.0	130	----
		Nickel, total	7440-02-0	E420	0.0354 mg/L	0.04 mg/L	88.4	70.0	130	----
		Phosphorus, total	7723-14-0	E420	10.1 mg/L	10 mg/L	101	70.0	130	----
		Potassium, total	7440-09-7	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		Rubidium, total	7440-17-7	E420	0.0182 mg/L	0.02 mg/L	91.0	70.0	130	----
		Selenium, total	7782-49-2	E420	0.0382 mg/L	0.04 mg/L	95.6	70.0	130	----
		Silicon, total	7440-21-3	E420	9.55 mg/L	10 mg/L	95.5	70.0	130	----
		Silver, total	7440-22-4	E420	0.00368 mg/L	0.004 mg/L	91.9	70.0	130	----
		Sodium, total	7440-23-5	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		Strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Sulfur, total	7704-34-9	E420	19.0 mg/L	20 mg/L	94.9	70.0	130	----
		Tellurium, total	13494-80-9	E420	0.0380 mg/L	0.04 mg/L	95.1	70.0	130	----
		Thallium, total	7440-28-0	E420	0.00354 mg/L	0.004 mg/L	88.4	70.0	130	----
		Thorium, total	7440-29-1	E420	0.0188 mg/L	0.02 mg/L	94.0	70.0	130	----
		Tin, total	7440-31-5	E420	0.0193 mg/L	0.02 mg/L	96.5	70.0	130	----
		Titanium, total	7440-32-6	E420	0.0373 mg/L	0.04 mg/L	93.4	70.0	130	----
		Tungsten, total	7440-33-7	E420	0.0193 mg/L	0.02 mg/L	96.4	70.0	130	----
		Uranium, total	7440-61-1	E420	0.00368 mg/L	0.004 mg/L	92.0	70.0	130	----
		Vanadium, total	7440-62-2	E420	0.0934 mg/L	0.1 mg/L	93.4	70.0	130	----
		Zinc, total	7440-66-6	E420	0.355 mg/L	0.4 mg/L	88.6	70.0	130	----
		Zirconium, total	7440-67-7	E420	0.0401 mg/L	0.04 mg/L	100	70.0	130	----




Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 1326779)										
KS2400340-001	Anonymous	Mercury, total	7439-97-6	E508	0.0000961 mg/L	0.0001 mg/L	96.1	70.0	130	----
Total Metals (QCLot: 1326780)										
VA24A2303-001	Anonymous	Mercury, total	7439-97-6	E508	0.0000942 mg/L	0.0001 mg/L	94.2	70.0	130	----
Dissolved Metals (QCLot: 1324879)										
VA24A2289-002	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.992 mg/L	1 mg/L	99.2	70.0	130	----
VA24A2289-002	Anonymous	Antimony, dissolved	7440-36-0	E421	0.101 mg/L	0.1 mg/L	101	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.0970 mg/L	0.1 mg/L	97.0	70.0	130	----
		Barium, dissolved	7440-39-3	E421	0.0996 mg/L	0.1 mg/L	99.6	70.0	130	----
		Beryllium, dissolved	7440-41-7	E421	0.197 mg/L	0.2 mg/L	98.5	70.0	130	----
		Bismuth, dissolved	7440-69-9	E421	0.0458 mg/L	0.05 mg/L	91.5	70.0	130	----
		Boron, dissolved	7440-42-8	E421	ND mg/L	0.1 mg/L	ND	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.0195 mg/L	0.02 mg/L	97.7	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		Cesium, dissolved	7440-46-2	E421	0.0495 mg/L	0.05 mg/L	99.1	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.197 mg/L	0.2 mg/L	98.6	70.0	130	----
		Cobalt, dissolved	7440-48-4	E421	0.0981 mg/L	0.1 mg/L	98.1	70.0	130	----
		Copper, dissolved	7440-50-8	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Iron, dissolved	7439-89-6	E421	9.72 mg/L	10 mg/L	97.2	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.0938 mg/L	0.1 mg/L	93.8	70.0	130	----
		Lithium, dissolved	7439-93-2	E421	0.490 mg/L	0.5 mg/L	98.0	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	0.0990 mg/L	0.1 mg/L	99.0	70.0	130	----
		Molybdenum, dissolved	7439-98-7	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.193 mg/L	0.2 mg/L	96.3	70.0	130	----
		Phosphorus, dissolved	7723-14-0	E421	52.6 mg/L	50 mg/L	105	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	ND mg/L	4 mg/L	ND	70.0	130	----
		Rubidium, dissolved	7440-17-7	E421	0.0981 mg/L	0.1 mg/L	98.1	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	ND mg/L	0.04 mg/L	ND	70.0	130	----
		Silicon, dissolved	7440-21-3	E421	50.6 mg/L	50 mg/L	101	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.0191 mg/L	0.02 mg/L	95.4	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	ND mg/L	2 mg/L	ND	70.0	130	----
		Strontium, dissolved	7440-24-6	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Sulfur, dissolved	7704-34-9	E421	ND mg/L	20 mg/L	ND	70.0	130	----
		Tellurium, dissolved	13494-80-9	E421	0.191 mg/L	0.2 mg/L	95.5	70.0	130	----
		Thallium, dissolved	7440-28-0	E421	0.0185 mg/L	0.02 mg/L	92.5	70.0	130	----



Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 1324879) - continued										
VA24A2289-002	Anonymous	Thorium, dissolved	7440-29-1	E421	0.0950 mg/L	0.1 mg/L	95.0	70.0	130	----
		Tin, dissolved	7440-31-5	E421	0.0998 mg/L	0.1 mg/L	99.8	70.0	130	----
		Titanium, dissolved	7440-32-6	E421	0.208 mg/L	0.2 mg/L	104	70.0	130	----
		Tungsten, dissolved	7440-33-7	E421	0.100 mg/L	0.1 mg/L	100	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	ND mg/L	0.004 mg/L	ND	70.0	130	----
		Vanadium, dissolved	7440-62-2	E421	0.512 mg/L	0.5 mg/L	102	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	1.92 mg/L	2 mg/L	95.9	70.0	130	----
		Zirconium, dissolved	7440-67-7	E421	0.211 mg/L	0.2 mg/L	105	70.0	130	----
Dissolved Metals (QCLot: 1325477)										
VA24A2225-011	Anonymous	Mercury, dissolved	7439-97-6	E509	0.000105 mg/L	0.0001 mg/L	105	70.0	130	----
Speciated Metals (QCLot: 1326126)										
VA24A2133-002	Anonymous	Chromium, hexavalent [Cr VI], dissolved	18540-29-9	E532A	26.2 mg/L	25 mg/L	105	70.0	130	----
Speciated Metals (QCLot: 1326128)										
VA24A2292-002	SQU US 1	Chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.259 mg/L	0.25 mg/L	104	70.0	130	----

 Eagle Mountain - Woodfibre Gas Pipeline Project BC Rail Waste Discharge Approval AE-111824 Report	Reporting Week	Feb 6 th to Feb 12 th , 2024
	Report #	10
	Appendix	B

Receiving Environment Field Notes and Logs



FortisBC Eagle Mountain-Woodfibre Gas Pipeline

Water Discharge Authorization Water Quality Monitoring

2024-2-6-Blanchard-00FCB

Project Component:	Tunnel	Site Name:	Receiving Environment - Downstream of Discharge
Inspection Date:	02/06/2024	Location:	BC Rail Site
Triton QP:	Sam Blanchard	Latitude/Longitude:	49.725282 -123.165175
Temperature(c):	Low 2 High 9	Permit:	AE 111824
Weather Conditions:	Clear	Ground Conditions:	Damp

Observations

Time: 10:21:36 **Flow Volume (visual):** moderate

Notes:

Odour Detected?: No **Notes:**

Unusual Colour?: No **Notes:**

Unusual Observations?: No **Notes:**

Sheen on Water?: No **Notes:**

Samples Collected - Parameters

Total Metals + Mercury	Yes	General Parameters (Alkalinity)	Yes	Other Sample: Phenols and chromium
Dissolved Metals + Mercury	Yes	Total Sulfide, Unionized Sulfide	Yes	
TSS	Yes	Anions	Yes	QA Samples: No Phenols and chromium
TDS	Yes	VOC/VPH	N/A	
Nutrients	Yes	EPH, PAH, LEPH/HEPH	N/A	
DOC	Yes	Trout LC50	N/A	

Logger Maintenance

Logger Maintenance Performed?	Yes	Photo of COC with Lab Signature?	Yes
--------------------------------------	-----	---	-----

Describe Logger Maintenance

Calibrated for turbidity using two point calibration: 0 NTU and 10 NTU. Set telemetry system back up. Restarted logger.

Photos



Photo: 1
Location: Downstream
Description: Downstream location - US View



Photo: 2
Location: Downstream
Description: Downstream location - Across View

Photos



Photo: 3
Location: Downstream
Description: Downstream location - DS View

ALS Environmental
Canada Toll Free: 1 800 888 8878

Chain of Custody (COC) / Analytical Request Form

Project Information

Client: **Energy Environmental**
Contact: **Miranda Lewis**
Address: **505-1111 West Georgia Street**
City/Province: **Vancouver BC**
Postal Code: **V6C 2E5**
Phone No: **604 681 1111**
Fax: **604 681 1111**

Report Format / Distribution

Report Format: **PDF**
Quality Control: **QC Report with Report**
Sample Distribution: **10**

ALS Account # / Query #
ALS Account #: **11984**
Query #: **11984 - Task 20 - Phase 30-4C**

Sample Information

ALS Lab Work Order # (Job use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date	Time	Sample Type
1001001	1001001	2024-02-06	10:35	Water
1001002	1001002	2024-02-06	11:03	Water

ANALYTICAL REQUESTS

Request 1: **Water**
Request 2: **Water**

Photo: 4
Location: Lab COC
Description: Lab COC



2024-2-6-Blanchard-00FCB

Sign Off

Report Prepared By: Sam Blanchard

Report Reviewed: Yes

Report Reviewer: Miranda Lewis

Professional(s) of Record: N/A

Name:

Designation:

Designation Number:



FortisBC Eagle Mountain-Woodfibre Gas Pipeline

Water Discharge Authorization Water Quality Monitoring

2024-2-6-Blanchard-1E3ED

Project Component:	Tunnel	Site Name:	Receiving Environment - Upstream of Discharge
Inspection Date:	02/06/2024	Location:	BC Rail Site
Triton QP:	Sam Blanchard	Latitude/Longitude:	49.726866 -123.163912
Temperature(c):	Low 2 High 9	Permit:	AE 111824
Weather Conditions:	Clear	Ground Conditions:	Damp

Observations

Time: 11:15:10 **Flow Volume (visual):** moderate

Notes:

Odour Detected?: No **Notes:**

Unusual Colour?: No **Notes:**

Unusual Observations?: No **Notes:**

Sheen on Water?: No **Notes:**

Samples Collected - Parameters

Total Metals + Mercury	Yes	General Parameters (Alkalinity)	Yes	Other Sample: Phenols and chromium
Dissolved Metals + Mercury	Yes	Total Sulfide, Unionized Sulfide	Yes	
TSS	Yes	Anions	Yes	QA Samples: No Phenols and chromium
TDS	Yes	VOC/VPH	N/A	
Nutrients	Yes	EPH, PAH, LEPH/HEPH	N/A	
DOC	Yes	Trout LC50	N/A	

Logger Maintenance

Logger Maintenance Performed?	Yes	Photo of COC with Lab Signature?	Yes
--------------------------------------	-----	---	-----

Describe Logger Maintenance

Calibrated for turbidity using two point calibration: 0 NTU and 10 NTU. Setup telemetry unit and connected to logger.

Photos



Photo: 1
Location: Upstream
Description: Upstream location - US View



Photo: 2
Location: Upstream
Description: Upstream location - Across View

Photos



Photo: 3
Location: Upstream
Description: Upstream location - DS View

ALS Lab Work Order # (Job use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date	Time	Sample Type
10U-488283	10U-488283	Feb 6, 2024	10:35	Water
10U-488283	10U-488283	Feb 6, 2024	11:03	Water

Photo: 4
Location: Lab COC
Description: Lab COC



Sign Off

Report Prepared By: Sam Blanchard

Report Reviewed: Yes

Report Reviewer: Miranda Lewis

Professional(s) of Record: N/A

Name:

Designation:

Designation Number: