Eagle Mountain - Woodfibre Gas Pipeline Project

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

Report Period: March 12th to March 17th, 2024

Contents

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 March 12th to March 17th, 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 one batch of treated water stored onsite was discharged by FortisBC's tunnel contractor Frontier-Kemper Michels Joint Venture (FKM) to the authorized point of discharge, 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 from the receiving environment sampling, 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 completed setting up the water treatment plant (WTP) including the installing the plumbing, pumps & equipment, and treatment chemicals. The assembly of the WTP components were completed on October 22, 2023. The commissioning of the WTP occurred throughout January and February 2024 prior to the first batch discharge. Water was sampled by FKM and confirmed 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, and also made publicly available on the FortisBC Eagle Mountain-Woodfibre Gas Pipeline Project | Talking Energy webpage.

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
	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

- There was 1 batch test discharge on Friday, March 15th, 2024 to authorized point of discharge during this reporting period.

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

Table 3 below includes information on the batch test water quality and lab sampling. Appendix A includes a full set of lab results with real time/field samples from the batch discharge.

Table 3: Discharge from Water Treatment System Information

Date of Lab Sample	Real Time Monitored	Field Samples Taken	Discharge Rate (batch)	Discharge Volume (batch)	Results
2024-03-11	N/A- Batch Sample	Yes-YSI ProDSS for Batch Sample	132GPM	130.11m^3	Full set of lab samples results, photo, documentation are provided in Appendix A

Exceedance details

No exceedances with the batch test discharge

Receiving Environment Summary

The receiving environment is being monitored as outlined in the permit. One batch was discharged from the BC Rail Site WTP during this reporting period. The Batch discharge met the permitted discharge requirements and did not result in negative impacts to the receiving environment. All recorded exceedances from the receiving environment are existing background quality and not related to project activities.

Table 4: Upstream Monitoring Information

Date of Lab Sample	Real Time Monitored	Field Samples Taken	Results
2024-03-12	Yes *	Yes *	Full set of lab sample results, photo and documentation are provided in Appendix B.
2024-03-11	Yes	Yes	Real time monitoring results are available. No visible sheen observed.

Table 5: Downstream Monitoring Information

Date of Lab Sample	Real Time Monitored	Field Samples Taken	Results
2023-03-12	Yes *	Yes *	Full set of lab sample results, photo and documentation are provided in Appendix B.
2024-03-11	Yes	Yes	Real time monitoring results available. No visible sheen observed.

***** 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

- Visual sheen checks were conducted in the receiving environment. No visual sheen was observed.
- 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.

Appendix A Point of Discharge from Water Treatment Plant Documentation

Batch Sample Analysis

BCR Batch Testing Results

Batch Number 3

(03-15-24)

Sara Derakhshi

03-19-24

Water Sample Results:

Client Sample ID			WTP Discharge	WTP Discharge	WTP Discharge	WTP Discharge		
Date Sampled			11-Mar-2024	15-Mar-2024	15-Mar-2024	15-Mar-2024		
Time Sampled			12:30	08:05	13:42	16:00		
Sample Type			Lab	In-Situ	In-Situ	In-Situ		
ALS Sample ID			VA24A5021-001	Before Discharging	During Discharging I	During Discharging II		
Analyte	Lowest Detection Limit	Units	Sub-Matrix: Water	Sub-Matrix: Water	Sub-Matrix: Water	Sub-Matrix: Water	BCAWWQG-FAL-ST	BCAWWQG-MAL-ST
In-Situ Parameters (Matrix: Water)								
Temperature, field		°C	7.90	3.1	8.5	8.6	19, hourly rate of change <1°C	Max +/- from BKG 1°C, hourly rate of change <0.5°C
pH, field		pH units	7.86	7.36	7.71	7.79	6.5-9.0	7.0-8.7
Salinity		ppt	0.24	0.31	0.27	0.28		
Conductivity		µS/cm	504.00	644.00	557	566.00		
Turbidity		NTU	2.02	2.28	1.29	1.27	Varies with background, Lowest value for guideline is 9 NTU	Varies with background, Lowest value for guideline is 9 NTU
ORP		Mv	135.20	54.00	132.0	135.60		
DO		mg/L	11.65	7.43	11.13	11.16		
Visible Sheen			No	No	No	No		
Physical Tests (Matrix: Water)								
Conductivity	2.0	µS/cm	521					
Alkalinity, bicarbonate (as CaCO3)	2.0	mg/L	221					
Alkalinity, carbonate (as CaCO3)	2.0	mg/L	4.8					
Alkalinity, hydroxide (as CaCO3)	2.0	mg/L	<2.0					
Alkalinity, phenolphthalein (as CaCO3)	2.0	mg/L	2.4					
Alkalinity, total (as CaCO3)	2.0	mg/L	226					

Hardness (as CaCO3), dissolved	0.60	mg/L	1.25					
Hardness (as CaCO3), from total Ca/Mg	0.60	mg/L	1.27					
Solids, total dissolved [TDS]	10	mg/L	319					
Solids, total suspended [TSS]	3.0	mg/L	<3.0				Varies with background, see note Lowest value for guideline is 26mg/L	Varies with background, see note Lowest value for guideline is 26mg/L
pH	0.10	pH units	8.32				6.5-9.0	7.0-8.7
Anions and Nutrients (Matrix: Water)								
Ammonia, total (as N)	0.0050	mg/L	1.20				8.4	
Bromide	0.050	mg/L	<0.050					
Chloride	0.50	mg/L	14.3				600	> 110% of background
Fluoride	0.020	mg/L	0.052					1.5
Nitrate (as N)	0.0050	mg/L	0.846				32.8	
Nitrite (as N)	0.0010	mg/L	0.0276				0.6	
Nitrogen, total	0.030	mg/L	2.27					
Sulfate (as SO4)	0.30	mg/L	17.0					
Ammonium (as NH4), field	0.0010	mg/L	1.53					
Organic / Inorganic Carbon (Matrix: Water)								
Carbon, dissolved organic [DOC]	0.50	mg/L	5.10					
Carbon, total organic [TOC]	0.50	mg/L	5.01					
Total Metals (Matrix: Water)								
Aluminum, total	0.0030	mg/L	0.0062					
Antimony, total	0.00010	mg/L	0.00074				0.25	
Arsenic, total	0.00010	mg/L	0.00048					
Barium, total	0.00010	mg/L	0.00130					
Beryllium, total	0.000100	mg/L	<0.000100					

Bismuth, total	0.000050	mg/L	<0.000050					
Boron, total	0.010	mg/L	0.020					
Cadmium, total	0.0000050	mg/L	<0.0000050					
Calcium, total	0.050	mg/L	0.475					
Cesium, total	0.000010	mg/L	0.000205					
Chromium, total	0.00050	mg/L	<0.00050					
Cobalt, total	0.00010	mg/L	<0.00010				0.11	
Copper, total	0.00050	mg/L	0.00099					0.003
Iron, total	0.010	mg/L	0.083				1	
Lead, total	0.000050	mg/L	<0.000050				0.003	0.14
Lithium, total	0.0010	mg/L	0.0050					
Magnesium, total	0.0050	mg/L	0.0197					
Manganese, total	0.00010	mg/L	0.00667				0.553	
Mercury, total	0.0000050	mg/L	<0.0000050					
Molybdenum, total	0.000050	mg/L	0.00637				46	
Nickel, total	0.00050	mg/L	<0.00050					
Phosphorus, total	0.050	mg/L	<0.050					
Potassium, total	0.050	mg/L	6.95					
Rubidium, total	0.00020	mg/L	0.0136					
Selenium, total	0.000050	mg/L	0.000088					
Silicon, total	0.10	mg/L	4.49					
Silver, total	0.000010	mg/L	<0.000010				0.0001	0.003
Sodium, total	0.050	mg/L	118					
Strontium, total	0.00020	mg/L	0.00119					
Sulfur, total	0.50	mg/L	6.70					
Tellurium, total	0.00020	mg/L	<0.00020					
Thallium, total	0.000010	mg/L	<0.000010					
Thorium, total	0.00010	mg/L	<0.00010					
Tin, total	0.00010	mg/L	<0.00010					
Titanium, total	0.00030	mg/L	<0.00030					
Tungsten, total	0.00010	mg/L	<0.00010					

Uranium, total	0.000010	mg/L	<0.000010					
Vanadium, total	0.00050	mg/L	<0.00050					
Zinc, total	0.0030	mg/L	0.0073					0.055
Zirconium, total	0.00020	mg/L	<0.00020					
Dissolved Metals (Matrix: Water)								
Aluminum, dissolved	0.0010	mg/L	0.0016					
Antimony, dissolved	0.00010	mg/L	0.00070					
Arsenic, dissolved	0.00010	mg/L	0.00040					
Barium, dissolved	0.00010	mg/L	0.00130					
Beryllium, dissolved	0.000100	mg/L	<0.000100					
Bismuth, dissolved	0.000050	mg/L	<0.000050					
Boron, dissolved	0.010	mg/L	0.020					
Cadmium, dissolved	0.0000050	mg/L	<0.0000050				0.00002	
Calcium, dissolved	0.050	mg/L	0.469					
Cesium, dissolved	0.000010	mg/L	0.000209					
Chromium, dissolved	0.00050	mg/L	<0.00050					
Cobalt, dissolved	0.00010	mg/L	<0.00010					
Copper, dissolved	0.00020	mg/L	0.00078				0.0112	
Iron, dissolved	0.010	mg/L	0.019				0.35	
Lead, dissolved	0.000050	mg/L	<0.000050					
Lithium, dissolved	0.0010	mg/L	0.0049					
Magnesium, dissolved	0.0050	mg/L	0.0186					
Manganese, dissolved	0.00010	mg/L	0.00630					
Mercury, dissolved	0.0000050	mg/L	<0.0000050					
Molybdenum, dissolved	0.000050	mg/L	0.00636					
Nickel, dissolved	0.00050	mg/L	<0.00050					
Phosphorus, dissolved	0.050	mg/L	<0.050					
Potassium, dissolved	0.050	mg/L	6.76					

Rubidium, dissolved	0.00020	mg/L	0.0131					
Selenium, dissolved	0.000050	mg/L	0.000068					
Silicon, dissolved	0.050	mg/L	4.33					
Silver, dissolved	0.000010	mg/L	<0.000010					
Sodium, dissolved	0.050	mg/L	112					
Strontium, dissolved	0.00020	mg/L	0.00114					
Sulfur, dissolved	0.50	mg/L	6.12					
Tellurium, dissolved	0.00020	mg/L	<0.00020					
Thallium, dissolved	0.000010	mg/L	<0.000010					
Thorium, dissolved	0.00010	mg/L	<0.00010					
Tin, dissolved	0.00010	mg/L	<0.00010					
Titanium, dissolved	0.00030	mg/L	<0.00030					
Tungsten, dissolved	0.00010	mg/L	<0.00010					
Uranium, dissolved	0.000010	mg/L	<0.000010					
Vanadium, dissolved	0.00050	mg/L	<0.00050					
Zinc, dissolved	0.0010	mg/L	0.0066				0.0186	
Zirconium, dissolved	0.00020	mg/L	<0.00020					
Dissolved mercury filtration location		-	Field					
Dissolved metals filtration location		-	Field					
Aggregate Organics (Matrix: Water)								
Phenols, total (4AAP)	0.0010	mg/L	0.0019				0.05	
Volatile Organic Compounds (Matrix: Water)								
Chlorobenzene	0.50	µg/L	<0.50					
Chloromethane	5.0	µg/L	<5.0					
Dichlorobenzene, 1,2-	0.50	µg/L	<0.50					
Dichlorobenzene, 1,3-	0.50	µg/L	<0.50					

Dichlorobenzene, 1,4-	0.50	µg/L	<0.50					
Dichloropropane, 1,2-	0.50	µg/L	<0.50					
Dichloropropylene, cis+trans-1,3-	0.75	µg/L	<0.75					
Dichloropropylene, cis-1,3-	0.50	µg/L	<0.50					
Tetrachloroethane, 1,1,1,2-	0.50	µg/L	<0.50					
Tetrachloroethane, 1,1,2,2-	0.20	µg/L	<0.20					
Trichloroethane, 1,1,2-	0.50	µg/L	<0.50					
Trichlorofluoromethane	0.50	µg/L	<0.50					
Volatile Organic Compounds [Drycleaning] (Matrix: Water)								
Carbon tetrachloride	0.50	µg/L	<0.50					
Chloroethane	0.50	µg/L	<0.50					
Dichloroethane, 1,1-	0.50	µg/L	<0.50					
Dichloroethane, 1,2-	0.50	µg/L	<0.50					
Dichloroethylene, 1,1-	0.50	µg/L	<0.50					
Dichloroethylene, cis-1,2-	0.50	µg/L	<0.50					
Dichloroethylene, trans-1,2-	0.50	µg/L	<0.50					
Dichloromethane	1.0	µg/L	<1.0					
Dichloropropylene, trans-1,3-	0.50	µg/L	<0.50					
Tetrachloroethylene	0.50	µg/L	<0.50					
Trichloroethane, 1,1,1-	0.50	µg/L	<0.50					
Trichloroethylene	0.50	µg/L	<0.50					
Vinyl chloride	0.40	µg/L	<0.40					
Volatile Organic Compounds [Fuels] (Matrix: Water)								
Benzene	0.50	µg/L	<0.50					
Ethylbenzene	0.50	µg/L	<0.50					

Methyl-tert-butyl ether [MTBE]	0.50	µg/L	<0.50				3400	440
Styrene	0.50	µg/L	<0.50					
Toluene	0.40	µg/L	<0.40					
Xylene, m+p-	0.40	µg/L	<0.40					
Xylene, o-	0.30	µg/L	<0.30					
Xylenes, total	0.50	µg/L	<0.50					
Volatile Organic Compounds [THMs] (Matrix: Water)								
Bromodichloromethane	0.50	µg/L	<0.50					
Bromoform	0.50	µg/L	<0.50					
Chloroform	0.50	µg/L	<0.50					
Dibromochloromethane	0.50	µg/L	<0.50					
Hydrocarbons (Matrix: Water)								
EPH (C10-C19)	250	µg/L	<250					
EPH (C19-C32)	250	µg/L	<250					
VHw (C6-C10)	100	µg/L	<100					
LEPHw	250	µg/L	<250					
VPHw	100	µg/L	<100					
HEPHw	250	µg/L	<250					
Hydrocarbons Surrogates (Matrix: Water)								
Bromobenzotrifluoride, 2- (EPH surrogate)	1.0	%	82.4					
Dichlorotoluene, 3,4-	1.0	%	76.1					
Volatile Organic Compounds Surrogates (Matrix: Water)								
Bromofluorobenzene, 4-	1.0	%	86.6					
Difluorobenzene, 1,4-	1.0	%	103					
Polycyclic Aromatic Hydrocarbons (Matrix: Water)								
Acenaphthene	0.010	µg/L	<0.010					
Acenaphthylene	0.010	µg/L	<0.010					
Acridine	0.010	µg/L	<0.010					
Anthracene	0.010	µg/L	<0.010					
Benz(a)anthracene	0.010	µg/L	<0.010				0.1	
Benzo(a)pyrene	0.0050	µg/L	<0.0050				0.1	

Benzo(b+j)fluoranthene	0.010	µg/L	<0.010					
Benzo(b+j+k)fluoranthene	0.015	µg/L	<0.015					
Benzo(g,h,i)perylene	0.010	µg/L	<0.010					
Benzo(k)fluoranthene	0.010	µg/L	<0.010					
Chrysene	0.010	µg/L	<0.010					
Dibenz(a,h)anthracene	0.0050	µg/L	<0.0050					
Fluoranthene	0.010	µg/L	<0.010				0.2	
Fluorene	0.010	µg/L	<0.010					
Indeno(1,2,3-c,d)pyrene	0.010	µg/L	<0.010					
Methylnaphthalene, 1-	0.010	µg/L	<0.010					
Methylnaphthalene, 2-	0.010	µg/L	<0.010					
Naphthalene	0.050	µg/L	<0.050					
Phenanthrene	0.020	µg/L	<0.020					
Pyrene	0.010	µg/L	<0.010				0.2	
Quinoline	0.050	µg/L	<0.050					
Polycyclic Aromatic Hydrocarbons Surrogates (Matrix: Water)								
Chrysene-d12	0.1	%	111					
Naphthalene-d8	0.1	%	96.0					
Phenanthrene-d10	0.1	%	108					
Glycols (Matrix: Water)								
Diethylene glycol	5.0	mg/L	<5.0					
Ethylene glycol	5.0	mg/L	<5.0					
Propylene glycol, 1,2-	5.0	mg/L	<5.0					
Triethylene glycol	5.0	mg/L	<5.0					
Glycols, total (EG+DEG+PG)	10	mg/L	<10					
Glycols Surrogates (Matrix: Water)								
Propanediol, 1,3-	1.0	%	81.2					

Batch Sample Lab Documentation

Deliverables for ALS Workorder VA24A5021

Project: EGP 150Results (VA24A5021-001):

Project	EGP 150		
Report To	Sara Derakhshi, Frontier-Kemper Michels Joint Venture		
Date Received	11-Mar-2024 14:15		
Issue Date	14-Mar-2024 16:23		
Amendment	0		
Client Sample ID			WTP Discharge
Date Sampled			11-Mar-2024
Time Sampled			12:30
ALS Sample ID			VA24A5021-001
Analyte	Lowest Detection Limit	Units	Sub-Matrix: Water
Field Tests (Matrix: Water)			
Temperature, field	0.10	°C	7.90
pH, field	0.10	pH units	7.86
Physical Tests (Matrix: Water)			
Conductivity	2.0	µS/cm	521
Alkalinity, bicarbonate (as CaCO3)	2.0	mg/L	221
Alkalinity, carbonate (as CaCO3)	2.0	mg/L	4.8
Alkalinity, hydroxide (as CaCO3)	2.0	mg/L	<2.0
Alkalinity, phenolphthalein (as CaCO3)	2.0	mg/L	2.4
Alkalinity, total (as CaCO3)	2.0	mg/L	226
Hardness (as CaCO3), dissolved	0.60	mg/L	1.25
Hardness (as CaCO3), from total Ca/Mg	0.60	mg/L	1.27
Solids, total dissolved [TDS]	10	mg/L	319
Solids, total suspended [TSS]	3.0	mg/L	<3.0
pH	0.10	pH units	8.32
Anions and Nutrients (Matrix: Water)			
Ammonia, total (as N)	0.0050	mg/L	1.20
Bromide	0.050	mg/L	<0.050
Chloride	0.50	mg/L	14.3
Fluoride	0.020	mg/L	0.052
Nitrate (as N)	0.0050	mg/L	0.846
Nitrite (as N)	0.0010	mg/L	0.0276
Nitrogen, total	0.030	mg/L	2.27
Sulfate (as SO4)	0.30	mg/L	17.0

Ammonium (as NH4), field	0.0010	mg/L	1.53
Organic / Inorganic Carbon (Matrix: Water)			
Carbon, dissolved organic [DOC]	0.50	mg/L	5.10
Carbon, total organic [TOC]	0.50	mg/L	5.01
Total Metals (Matrix: Water)			
Aluminum, total	0.0030	mg/L	0.0062
Antimony, total	0.00010	mg/L	0.00074
Arsenic, total	0.00010	mg/L	0.00048
Barium, total	0.00010	mg/L	0.00130
Beryllium, total	0.000100	mg/L	<0.000100
Bismuth, total	0.000050	mg/L	<0.000050
Boron, total	0.010	mg/L	0.020
Cadmium, total	0.0000050	mg/L	<0.0000050
Calcium, total	0.050	mg/L	0.475
Cesium, total	0.000010	mg/L	0.000205
Chromium, total	0.00050	mg/L	<0.00050
Cobalt, total	0.00010	mg/L	<0.00010
Copper, total	0.00050	mg/L	0.00099
Iron, total	0.010	mg/L	0.083
Lead, total	0.000050	mg/L	<0.000050
Lithium, total	0.0010	mg/L	0.0050
Magnesium, total	0.0050	mg/L	0.0197
Manganese, total	0.00010	mg/L	0.00667
Mercury, total	0.0000050	mg/L	<0.0000050
Molybdenum, total	0.000050	mg/L	0.00637
Nickel, total	0.00050	mg/L	<0.00050
Phosphorus, total	0.050	mg/L	<0.050
Potassium, total	0.050	mg/L	6.95
Rubidium, total	0.00020	mg/L	0.0136
Selenium, total	0.000050	mg/L	0.000088
Silicon, total	0.10	mg/L	4.49
Silver, total	0.000010	mg/L	<0.000010
Sodium, total	0.050	mg/L	118
Strontium, total	0.00020	mg/L	0.00119
Sulfur, total	0.50	mg/L	6.70
Tellurium, total	0.00020	mg/L	<0.00020
Thallium, total	0.000010	mg/L	<0.000010
Thorium, total	0.00010	mg/L	<0.00010
Tin, total	0.00010	mg/L	<0.00010
Titanium, total	0.00030	mg/L	<0.00030
Tungsten, total	0.00010	mg/L	<0.00010

Uranium, total	0.000010	mg/L	<0.000010
Vanadium, total	0.00050	mg/L	<0.00050
Zinc, total	0.0030	mg/L	0.0073
Zirconium, total	0.00020	mg/L	<0.00020
Dissolved Metals (Matrix: Water)			
Aluminum, dissolved	0.0010	mg/L	0.0016
Antimony, dissolved	0.00010	mg/L	0.00070
Arsenic, dissolved	0.00010	mg/L	0.00040
Barium, dissolved	0.00010	mg/L	0.00130
Beryllium, dissolved	0.000100	mg/L	<0.000100
Bismuth, dissolved	0.000050	mg/L	<0.000050
Boron, dissolved	0.010	mg/L	0.020
Cadmium, dissolved	0.0000050	mg/L	<0.0000050
Calcium, dissolved	0.050	mg/L	0.469
Cesium, dissolved	0.000010	mg/L	0.000209
Chromium, dissolved	0.00050	mg/L	<0.00050
Cobalt, dissolved	0.00010	mg/L	<0.00010
Copper, dissolved	0.00020	mg/L	0.00078
Iron, dissolved	0.010	mg/L	0.019
Lead, dissolved	0.000050	mg/L	<0.000050
Lithium, dissolved	0.0010	mg/L	0.0049
Magnesium, dissolved	0.0050	mg/L	0.0186
Manganese, dissolved	0.00010	mg/L	0.00630
Mercury, dissolved	0.0000050	mg/L	<0.0000050
Molybdenum, dissolved	0.000050	mg/L	0.00636
Nickel, dissolved	0.00050	mg/L	<0.00050
Phosphorus, dissolved	0.050	mg/L	<0.050
Potassium, dissolved	0.050	mg/L	6.76
Rubidium, dissolved	0.00020	mg/L	0.0131
Selenium, dissolved	0.000050	mg/L	0.000068
Silicon, dissolved	0.050	mg/L	4.33
Silver, dissolved	0.000010	mg/L	<0.000010
Sodium, dissolved	0.050	mg/L	112
Strontium, dissolved	0.00020	mg/L	0.00114
Sulfur, dissolved	0.50	mg/L	6.12
Tellurium, dissolved	0.00020	mg/L	<0.00020
Thallium, dissolved	0.000010	mg/L	<0.000010
Thorium, dissolved	0.00010	mg/L	<0.00010
Tin, dissolved	0.00010	mg/L	<0.00010
Titanium, dissolved	0.00030	mg/L	<0.00030
Tungsten, dissolved	0.00010	mg/L	<0.00010
Uranium, dissolved	0.000010	mg/L	<0.000010

Vanadium, dissolved	0.00050	mg/L	<0.00050
Zinc, dissolved	0.0010	mg/L	0.0066
Zirconium, dissolved	0.00020	mg/L	<0.00020
Dissolved mercury filtration location			Field
Dissolved metals filtration location			Field
Aggregate Organics (Matrix: Water)			
Phenols, total (4AAP)	0.0010	mg/L	0.0019
Volatile Organic Compounds (Matrix: Water)			
Chlorobenzene	0.50	µg/L	<0.50
Chloromethane	5.0	µg/L	<5.0
Dichlorobenzene, 1,2-	0.50	µg/L	<0.50
Dichlorobenzene, 1,3-	0.50	µg/L	<0.50
Dichlorobenzene, 1,4-	0.50	µg/L	<0.50
Dichloropropane, 1,2-	0.50	µg/L	<0.50
Dichloropropylene, cis+trans-1,3-	0.75	µg/L	<0.75
Dichloropropylene, cis-1,3-	0.50	µg/L	<0.50
Tetrachloroethane, 1,1,1,2-	0.50	µg/L	<0.50
Tetrachloroethane, 1,1,2,2-	0.20	µg/L	<0.20
Trichloroethane, 1,1,2-	0.50	µg/L	<0.50
Trichlorofluoromethane	0.50	µg/L	<0.50
Volatile Organic Compounds [Drycleaning] (Matrix: Water)			
Carbon tetrachloride	0.50	µg/L	<0.50
Chloroethane	0.50	µg/L	<0.50
Dichloroethane, 1,1-	0.50	µg/L	<0.50
Dichloroethane, 1,2-	0.50	µg/L	<0.50
Dichloroethylene, 1,1-	0.50	µg/L	<0.50
Dichloroethylene, cis-1,2-	0.50	µg/L	<0.50
Dichloroethylene, trans-1,2-	0.50	µg/L	<0.50
Dichloromethane	1.0	µg/L	<1.0
Dichloropropylene, trans-1,3-	0.50	µg/L	<0.50
Tetrachloroethylene	0.50	µg/L	<0.50
Trichloroethane, 1,1,1-	0.50	µg/L	<0.50
Trichloroethylene	0.50	µg/L	<0.50
Vinyl chloride	0.40	µg/L	<0.40
Volatile Organic Compounds [Fuels] (Matrix: Water)			
Benzene	0.50	µg/L	<0.50
Ethylbenzene	0.50	µg/L	<0.50
Methyl-tert-butyl ether [MTBE]	0.50	µg/L	<0.50
Styrene	0.50	µg/L	<0.50

Toluene	0.40	µg/L	<0.40
Xylene, m+p-	0.40	µg/L	<0.40
Xylene, o-	0.30	µg/L	<0.30
Xylenes, total	0.50	µg/L	<0.50
Volatile Organic Compounds [THMs] (Matrix: Water)			
Bromodichloromethane	0.50	µg/L	<0.50
Bromoform	0.50	µg/L	<0.50
Chloroform	0.50	µg/L	<0.50
Dibromochloromethane	0.50	µg/L	<0.50
Hydrocarbons (Matrix: Water)			
EPH (C10-C19)	250	µg/L	<250
EPH (C19-C32)	250	µg/L	<250
VHw (C6-C10)	100	µg/L	<100
LEPHw	250	µg/L	<250
VPHw	100	µg/L	<100
HEPHw	250	µg/L	<250
Hydrocarbons Surrogates (Matrix: Water)			
Bromobenzotrifluoride, 2- (EPH surrogate)	1.0	%	82.4
Dichlorotoluene, 3,4-	1.0	%	76.1
Volatile Organic Compounds Surrogates (Matrix: Water)			
Bromofluorobenzene, 4-	1.0	%	86.6
Difluorobenzene, 1,4-	1.0	%	103
Polycyclic Aromatic Hydrocarbons (Matrix: Water)			
Acenaphthene	0.010	µg/L	<0.010
Acenaphthylene	0.010	µg/L	<0.010
Acridine	0.010	µg/L	<0.010
Anthracene	0.010	µg/L	<0.010
Benz(a)anthracene	0.010	µg/L	<0.010
Benzo(a)pyrene	0.0050	µg/L	<0.0050
Benzo(b+j)fluoranthene	0.010	µg/L	<0.010
Benzo(b+j+k)fluoranthene	0.015	µg/L	<0.015
Benzo(g,h,i)perylene	0.010	µg/L	<0.010
Benzo(k)fluoranthene	0.010	µg/L	<0.010
Chrysene	0.010	µg/L	<0.010
Dibenz(a,h)anthracene	0.0050	µg/L	<0.0050
Fluoranthene	0.010	µg/L	<0.010
Fluorene	0.010	µg/L	<0.010
Indeno(1,2,3-c,d)pyrene	0.010	µg/L	<0.010

Methylnaphthalene, 1-	0.010	µg/L	<0.010
Methylnaphthalene, 2-	0.010	µg/L	<0.010
Naphthalene	0.050	µg/L	<0.050
Phenanthrene	0.020	µg/L	<0.020
Pyrene	0.010	µg/L	<0.010
Quinoline	0.050	µg/L	<0.050
Polycyclic Aromatic Hydrocarbons Surrogates (Matrix: Water)			
Chrysene-d12	0.1	%	111
Naphthalene-d8	0.1	%	96.0
Phenanthrene-d10	0.1	%	108
Glycols (Matrix: Water)			
Diethylene glycol	5.0	mg/L	<5.0
Ethylene glycol	5.0	mg/L	<5.0
Propylene glycol, 1,2-	5.0	mg/L	<5.0
Triethylene glycol	5.0	mg/L	<5.0
Glycols, total (EG+DEG+PG)	10	mg/L	<10
Glycols Surrogates (Matrix: Water)			
Propanediol, 1,3-	1.0	%	81.2

VA24A5021_0_COA - Crosstab (CAN):

ALS Canada Ltd.

CERTIFICATE OF ANALYSIS

Work Order	: **VA24A5021**	Page	: 1 of 9
Client	: **Frontier-Kemper Michels Joint Venture**	Laboratory	: ALS Environmental - Vancouver
Contact	: Sara Derakhshi	Account Manager	: Thomas Chang
Address	: 404-850 Harbourside Drive North Vancouver BC Canada V7P 0A3	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	: ----	Telephone	: +1 604 253 4188
Project	: EGP 150	Date Samples Received	: 11-Mar-2024 14:15
PO	: ----	Date Analysis Commenced	: 11-Mar-2024
C-O-C number	: 23-1084264	Issue Date	: 14-Mar-2024 16:23
Sampler	: ----		
Site	: BC Rail		
Quote number	: WTP Dishcarge		
No. of samples received	1		
No. of samples analysed	1		

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
- Surrogate Control Limits

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.

Signatories	*Position*	*Laboratory Department*
Angelo Salandanan	Lab Assistant	Metals, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Kate Dimitrova	Supervisor - Inorganic	Inorganics, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Leon Yang	Analyst	Inorganics, Burnaby, British Columbia
Nik Perkio	Inorganics Analyst	Inorganics, Waterloo, Ontario
Owen Cheng		Metals, Burnaby, British Columbia
Paul Cushing	Team Leader - Organics	Organics, Burnaby, British Columbia
Tracy Harley	Supervisor - Water Quality Instrumentation	Inorganics, Burnaby, British Columbia
Virginia Smith	Account Manager Assistant	Administration, 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).

Unit	*Description*
-	no units
°C	degrees celsius
µg/L	micrograms per litre
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.

Sample Comments

Sample	Client Id	*Comment*
VA24A5021-001	WTP Discharge	***Sample(s) 001: Water sample for VOC analysis contained > 5% headspace. Results may be biased low.***
VA24A5021-001	WTP Discharge	Water sample for dissolved mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low.
VA24A5021-001	WTP Discharge	Water sample for total mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low.

Analytical Results

Sub-Matrix: Water (Matrix: Water)				Client sample ID	WTP Discharge	----	----	----	----
				Client sampling date / time	11-Mar-2024 12:30	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	VA24A5021-001	------	------	-------	------
					Result	---	---	---	---
Field Tests									
pH, field	----	EF001/VA	0.10	pH units	7.88	----	----	----	----
Temperature, field	----	EF001/VA	0.10	°C	7.90	----	----	----	----
Physical Tests									
Alkalinity, bicarbonate (as CaCO3)	----	E290/VA	2.0	mg/L	221	----	----	----	----
Alkalinity, carbonate (as CaCO3)	----	E290/VA	2.0	mg/L	4.8	----	----	----	----
Alkalinity, hydroxide (as CaCO3)	----	E290/VA	2.0	mg/L	<2.0	----	----	----	----
Alkalinity, phenolphthalein (as CaCO3)	----	E290/VA	2.0	mg/L	2.4	----	----	----	----
Alkalinity, total (as CaCO3)	----	E290/VA	2.0	mg/L	226	----	----	----	----
Conductivity	----	E100/VA	2.0	µS/cm	521	----	----	----	----
Hardness (as CaCO3), dissolved	----	EC100/VA	0.60	mg/L	1.25	----	----	----	----
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/VA	0.60	mg/L	1.27	----	----	----	----
pH	----	E108/VA	0.10	pH units	8.32	----	----	----	----
Solids, total dissolved [TDS]	----	E162/VA	10	mg/L	319	----	----	----	----
Solids, total suspended [TSS]	----	E160/VA	3.0	mg/L	<3.0	----	----	----	----
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298/VA	0.0050	mg/L	1.20	----	----	----	----
Ammonium (as NH4), field	14798-03-9	EC298A/VA	0.0010	mg/L	1.53	----	----	----	----
Bromide	24959-67-9	E235.Br-L/VA	0.050	mg/L	<0.050	----	----	----	----
Chloride	16887-00-6	E235.Cl/VA	0.50	mg/L	14.3	----	----	----	----
Fluoride	16984-48-8	E235.F/VA	0.020	mg/L	0.052	----	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	0.0050	mg/L	0.846	----	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	0.0010	mg/L	0.0276	----	----	----	----
Nitrogen, total	7727-37-9	E366/VA	0.030	mg/L	2.27	----	----	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/VA	0.30	mg/L	17.0	----	----	----	----
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L/VA	0.50	mg/L	5.10	----	----	----	----
Carbon, total organic [TOC]	----	E355-L/VA	0.50	mg/L	5.01	----	----	----	----
Total Metals									

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	WTP Discharge	---	---	---	---
					Client sampling date / time	11-Mar-2024 12:30	---	---	---	---
Analyte	CAS Number	Method/Lab	LOR	Unit		VA24A5021-001	-------	-------	-------	-------
						Result	---	---	---	---
Total Metals										
Aluminum, total	7429-90-5	E420/VA	0.0030	mg/L		0.0062	---	---	---	---
Antimony, total	7440-36-0	E420/VA	0.00010	mg/L		0.00074	---	---	---	---
Arsenic, total	7440-38-2	E420/VA	0.00010	mg/L		0.00048	---	---	---	---
Barium, total	7440-39-3	E420/VA	0.00010	mg/L		0.00130	---	---	---	---
Beryllium, total	7440-41-7	E420/VA	0.000100	mg/L		<0.000100	---	---	---	---
Bismuth, total	7440-69-9	E420/VA	0.000050	mg/L		<0.000050	---	---	---	---
Boron, total	7440-42-8	E420/VA	0.010	mg/L		0.020	---	---	---	---
Cadmium, total	7440-43-9	E420/VA	0.0000050	mg/L		<0.0000050	---	---	---	---
Calcium, total	7440-70-2	E420/VA	0.050	mg/L		0.475	---	---	---	---
Cesium, total	7440-46-2	E420/VA	0.000010	mg/L		0.000205	---	---	---	---
Chromium, total	7440-47-3	E420/VA	0.00050	mg/L		<0.00050	---	---	---	---
Cobalt, total	7440-48-4	E420/VA	0.00010	mg/L		<0.00010	---	---	---	---
Copper, total	7440-50-8	E420/VA	0.00050	mg/L		0.00099	---	---	---	---
Iron, total	7439-89-6	E420/VA	0.010	mg/L		0.083	---	---	---	---
Lead, total	7439-92-1	E420/VA	0.000050	mg/L		<0.000050	---	---	---	---
Lithium, total	7439-93-2	E420/VA	0.0010	mg/L		0.0050	---	---	---	---
Magnesium, total	7439-95-4	E420/VA	0.0050	mg/L		0.0197	---	---	---	---
Manganese, total	7439-96-5	E420/VA	0.00010	mg/L		0.00867	---	---	---	---
Mercury, total	7439-97-6	E508/VA	0.0000050	mg/L		<0.0000050	---	---	---	---
Molybdenum, total	7439-98-7	E420/VA	0.000050	mg/L		0.00637	---	---	---	---
Nickel, total	7440-02-0	E420/VA	0.00050	mg/L		<0.00050	---	---	---	---
Phosphorus, total	7723-14-0	E420/VA	0.050	mg/L		<0.050	---	---	---	---
Potassium, total	7440-09-7	E420/VA	0.050	mg/L		6.95	---	---	---	---
Rubidium, total	7440-17-7	E420/VA	0.00020	mg/L		0.0136	---	---	---	---
Selenium, total	7782-49-2	E420/VA	0.000050	mg/L		0.000088	---	---	---	---
Silicon, total	7440-21-3	E420/VA	0.10	mg/L		4.49	---	---	---	---
Silver, total	7440-22-4	E420/VA	0.000010	mg/L		<0.000010	---	---	---	---
Sodium, total	7440-23-5	E420/VA	0.050	mg/L		118	---	---	---	---
Strontium, total	7440-24-6	E420/VA	0.00020	mg/L		0.00119	---	---	---	---
Sulfur, total	7704-34-9	E420/VA	0.50	mg/L		6.70	---	---	---	---

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	WTP Discharge	----	----	----	----
					Client sampling date / time	11-Mar-2024 12:30	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		VA24A5021-001	----	----	----	----
						Result	----	----	----	----
Total Metals										
Tellurium, total	13494-80-9	E420/VA	0.00020	mg/L		<0.00020	----	----	----	----
Thallium, total	7440-28-0	E420/VA	0.000010	mg/L		<0.000010	----	----	----	----
Thorium, total	7440-29-1	E420/VA	0.00010	mg/L		<0.00010	----	----	----	----
Tin, total	7440-31-5	E420/VA	0.00010	mg/L		<0.00010	----	----	----	----
Titanium, total	7440-32-6	E420/VA	0.00030	mg/L		<0.00030	----	----	----	----
Tungsten, total	7440-33-7	E420/VA	0.00010	mg/L		<0.00010	----	----	----	----
Uranium, total	7440-61-1	E420/VA	0.000010	mg/L		<0.000010	----	----	----	----
Vanadium, total	7440-62-2	E420/VA	0.00050	mg/L		<0.00050	----	----	----	----
Zinc, total	7440-66-6	E420/VA	0.0030	mg/L		0.0073	----	----	----	----
Zirconium, total	7440-67-7	E420/VA	0.00020	mg/L		<0.00020	----	----	----	----
Dissolved Metals										
Aluminum, dissolved	7429-90-5	E421/VA	0.0010	mg/L		0.0016	----	----	----	----
Antimony, dissolved	7440-36-0	E421/VA	0.00010	mg/L		0.00070	----	----	----	----
Arsenic, dissolved	7440-38-2	E421/VA	0.00010	mg/L		0.00040	----	----	----	----
Barium, dissolved	7440-39-3	E421/VA	0.00010	mg/L		0.00130	----	----	----	----
Beryllium, dissolved	7440-41-7	E421/VA	0.000100	mg/L		<0.000100	----	----	----	----
Bismuth, dissolved	7440-69-9	E421/VA	0.000050	mg/L		<0.000050	----	----	----	----
Boron, dissolved	7440-42-8	E421/VA	0.010	mg/L		0.026	----	----	----	----
Cadmium, dissolved	7440-43-9	E421/VA	0.0000050	mg/L		<0.0000050	----	----	----	----
Calcium, dissolved	7440-70-2	E421/VA	0.050	mg/L		0.469	----	----	----	----
Cesium, dissolved	7440-46-2	E421/VA	0.000010	mg/L		0.000209	----	----	----	----
Chromium, dissolved	7440-47-3	E421/VA	0.00050	mg/L		<0.00050	----	----	----	----
Cobalt, dissolved	7440-48-4	E421/VA	0.00010	mg/L		<0.00010	----	----	----	----
Copper, dissolved	7440-50-8	E421/VA	0.00020	mg/L		0.00078	----	----	----	----
Iron, dissolved	7439-89-6	E421/VA	0.010	mg/L		0.019	----	----	----	----
Lead, dissolved	7439-92-1	E421/VA	0.000050	mg/L		<0.000050	----	----	----	----
Lithium, dissolved	7439-93-2	E421/VA	0.0010	mg/L		0.0049	----	----	----	----
Magnesium, dissolved	7439-95-4	E421/VA	0.0050	mg/L		0.0186	----	----	----	----
Manganese, dissolved	7439-96-5	E421/VA	0.00010	mg/L		0.00630	----	----	----	----
Mercury, dissolved	7439-97-6	E509/VA	0.0000050	mg/L		<0.0000050	----	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	WTP Discharge	---	---	---	---
					Client sampling date / time	11-Mar-2024 12:30	---	---	---	---
Analyte	CAS Number	Method/Lab	LOR	Unit		VA24A5021-001	-------	-------	-------	-------
						Result	---	---	---	---
Dissolved Metals										
Molybdenum, dissolved	7439-98-7	E421/VA	0.000050	mg/L		0.00636	---	---	---	---
Nickel, dissolved	7440-02-0	E421/VA	0.00050	mg/L		<0.00050	---	---	---	---
Phosphorus, dissolved	7723-14-0	E421/VA	0.050	mg/L		<0.050	---	---	---	---
Potassium, dissolved	7440-09-7	E421/VA	0.050	mg/L		6.76	---	---	---	---
Rubidium, dissolved	7440-17-7	E421/VA	0.00020	mg/L		0.0131	---	---	---	---
Selenium, dissolved	7782-49-2	E421/VA	0.000050	mg/L		0.000068	---	---	---	---
Silicon, dissolved	7440-21-3	E421/VA	0.050	mg/L		4.33	---	---	---	---
Silver, dissolved	7440-22-4	E421/VA	0.000010	mg/L		<0.000010	---	---	---	---
Sodium, dissolved	7440-23-5	E421/VA	0.050	mg/L		112	---	---	---	---
Strontium, dissolved	7440-24-6	E421/VA	0.00020	mg/L		0.00114	---	---	---	---
Sulfur, dissolved	7704-34-9	E421/VA	0.50	mg/L		6.12	---	---	---	---
Tellurium, dissolved	13494-80-9	E421/VA	0.00020	mg/L		<0.00020	---	---	---	---
Thallium, dissolved	7440-28-0	E421/VA	0.000010	mg/L		<0.000010	---	---	---	---
Thorium, dissolved	7440-29-1	E421/VA	0.00010	mg/L		<0.00010	---	---	---	---
Tin, dissolved	7440-31-5	E421/VA	0.00010	mg/L		<0.00010	---	---	---	---
Titanium, dissolved	7440-32-6	E421/VA	0.00030	mg/L		<0.00030	---	---	---	---
Tungsten, dissolved	7440-33-7	E421/VA	0.00010	mg/L		<0.00010	---	---	---	---
Uranium, dissolved	7440-61-1	E421/VA	0.000010	mg/L		<0.000010	---	---	---	---
Vanadium, dissolved	7440-62-2	E421/VA	0.00050	mg/L		<0.00050	---	---	---	---
Zinc, dissolved	7440-66-6	E421/VA	0.0010	mg/L		0.0066	---	---	---	---
Zirconium, dissolved	7440-67-7	E421/VA	0.00020	mg/L		<0.00020	---	---	---	---
Dissolved mercury filtration location	---	EP509/VA	-	-		Field	---	---	---	---
Dissolved metals filtration location	---	EP421/VA	-	-		Field	---	---	---	---
Aggregate Organics										
Phenols, total (4AAP)	---	E562/WT	0.0010	mg/L		0.0019	---	---	---	---
Volatile Organic Compounds										
Chlorobenzene	108-90-7	E611C/VA	0.50	µg/L		<0.50	---	---	---	---
Chloromethane	74-87-3	E611C/VA	5.0	µg/L		<5.0	---	---	---	---
Dichlorobenzene, 1,2-	95-50-1	E611C/VA	0.50	µg/L		<0.50	---	---	---	---
Dichlorobenzene, 1,3-	541-73-1	E611C/VA	0.50	µg/L		<0.50	---	---	---	---

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	WTP Discharge	----	----	----	----
					Client sampling date / time	11-Mar-2024 12:30	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		VA24A5021-001	----	----	----	----
						Result	----	----	----	----
Volatile Organic Compounds										
Dichlorobenzene, 1,4-	106-46-7	E611C/VA	0.50	µg/L		<0.50	----	----	----	----
Dichloropropane, 1,2-	78-87-5	E611C/VA	0.50	µg/L		<0.50	----	----	----	----
Dichloropropylene, cis+trans-1,3-	542-75-6	E611C/VA	0.75	µg/L		<0.75	----	----	----	----
Dichloropropylene, cis-1,3-	10061-01-5	E611C/VA	0.50	µg/L		<0.50	----	----	----	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611C/VA	0.50	µg/L		<0.50	----	----	----	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611C/VA	0.20	µg/L		<0.20	----	----	----	----
Trichloroethane, 1,1,2-	79-00-5	E611C/VA	0.50	µg/L		<0.50	----	----	----	----
Trichlorofluoromethane	75-69-4	E611C/VA	0.50	µg/L		<0.50	----	----	----	----
Volatile Organic Compounds [Drycleaning]										
Carbon tetrachloride	56-23-5	E611C/VA	0.50	µg/L		<0.50	----	----	----	----
Chloroethane	75-00-3	E611C/VA	0.50	µg/L		<0.50	----	----	----	----
Dichloroethane, 1,1-	75-34-3	E611C/VA	0.50	µg/L		<0.50	----	----	----	----
Dichloroethane, 1,2-	107-06-2	E611C/VA	0.50	µg/L		<0.50	----	----	----	----
Dichloroethylene, 1,1-	75-35-4	E611C/VA	0.50	µg/L		<0.50	----	----	----	----
Dichloroethylene, cis-1,2-	156-59-2	E611C/VA	0.50	µg/L		<0.50	----	----	----	----
Dichloroethylene, trans-1,2-	156-60-5	E611C/VA	0.50	µg/L		<0.50	----	----	----	----
Dichloromethane	75-09-2	E611C/VA	1.0	µg/L		<1.0	----	----	----	----
Dichloropropylene, trans-1,3-	10061-02-6	E611C/VA	0.50	µg/L		<0.50	----	----	----	----
Tetrachloroethylene	127-18-4	E611C/VA	0.50	µg/L		<0.50	----	----	----	----
Trichloroethane, 1,1,1-	71-55-6	E611C/VA	0.50	µg/L		<0.50	----	----	----	----
Trichloroethylene	79-01-6	E611C/VA	0.50	µg/L		<0.50	----	----	----	----
Vinyl chloride	75-01-4	E611C/VA	0.40	µg/L		<0.40	----	----	----	----
Volatile Organic Compounds [Fuels]										
Benzene	71-43-2	E611C/VA	0.50	µg/L		<0.50	----	----	----	----
Ethylbenzene	100-41-4	E611C/VA	0.50	µg/L		<0.50	----	----	----	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611C/VA	0.50	µg/L		<0.50	----	----	----	----
Styrene	100-42-5	E611C/VA	0.50	µg/L		<0.50	----	----	----	----
Toluene	108-88-3	E611C/VA	0.40	µg/L		<0.40	----	----	----	----
Xylene, m+p-	179601-23-1	E611C/VA	0.40	µg/L		<0.40	----	----	----	----
Xylene, o-	95-47-6	E611C/VA	0.30	µg/L		<0.30	----	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	WTP Discharge	----	----	----	----
					Client sampling date / time	11-Mar-2024 12:30	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		VA24A5021-001	----	----	----	----
						Result				
Volatile Organic Compounds [Fuels]										
Xylenes, total	1330-20-7	E611C/VA	0.50	µg/L		<0.50	----	----	----	----
Volatile Organic Compounds [THMs]										
Bromodichloromethane	75-27-4	E611C/VA	0.50	µg/L		<0.50	----	----	----	----
Bromoform	75-25-2	E611C/VA	0.50	µg/L		<0.50	----	----	----	----
Chloroform	67-66-3	E611C/VA	0.50	µg/L		<0.50	----	----	----	----
Dibromochloromethane	124-48-1	E611C/VA	0.50	µg/L		<0.50	----	----	----	----
Hydrocarbons										
EPH (C10-C19)	----	E601A/VA	250	µg/L		<250	----	----	----	----
EPH (C19-C32)	----	E601A/VA	250	µg/L		<250	----	----	----	----
VHw (C6-C10)	----	E581.VH+F1/VA	100	µg/L		<100	----	----	----	----
HEPHw	----	EC600A/VA	250	µg/L		<250	----	----	----	----
LEPHw	----	EC600A/VA	250	µg/L		<250	----	----	----	----
VPHw	----	EC580A/VA	100	µg/L		<100	----	----	----	----
Hydrocarbons Surrogates										
Bromobenzotrifluoride, 2- (EPH surrogate)	392-83-6	E601A/VA	1.0	%		82.4	----	----	----	----
Dichlorotoluene, 3,4-	95-75-0	E581.VH+F1/VA	1.0	%		76.1	----	----	----	----
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611C/VA	1.0	%		86.6	----	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611C/VA	1.0	%		103	----	----	----	----
Polycyclic Aromatic Hydrocarbons										
Acenaphthene	83-32-9	E641A/VA	0.010	µg/L		<0.010	----	----	----	----
Acenaphthylene	208-96-8	E641A/VA	0.010	µg/L		<0.010	----	----	----	----
Acridine	260-94-6	E641A/VA	0.010	µg/L		<0.010	----	----	----	----
Anthracene	120-12-7	E641A/VA	0.010	µg/L		<0.010	----	----	----	----
Benz(a)anthracene	56-55-3	E641A/VA	0.010	µg/L		<0.010	----	----	----	----
Benzo(a)pyrene	50-32-8	E641A/VA	0.0050	µg/L		<0.0050	----	----	----	----
Benzo(b+j)fluoranthene	n/a	E641A/VA	0.010	µg/L		<0.010	----	----	----	----
Benzo(b+j+k)fluoranthene	n/a	E641A/VA	0.015	µg/L		<0.015	----	----	----	----

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: WTP Discharge	----	----	----	----
					Client sampling date / time: 11-Mar-2024 12:30	----	----	----	----
					VA24A5021-001	----	----	----	----
					Result	----	----	----	----
Polycyclic Aromatic Hydrocarbons									
Benzo(g,h,i)perylene	191-24-2	E641A/VA	0.010	µg/L	<0.010	----	----	----	----
Benzo(k)fluoranthene	207-08-9	E641A/VA	0.010	µg/L	<0.010	----	----	----	----
Chrysene	218-01-9	E641A/VA	0.010	µg/L	<0.010	----	----	----	----
Dibenz(a,h)anthracene	53-70-3	E641A/VA	0.0050	µg/L	<0.0050	----	----	----	----
Fluoranthene	206-44-0	E641A/VA	0.010	µg/L	<0.010	----	----	----	----
Fluorene	86-73-7	E641A/VA	0.010	µg/L	<0.010	----	----	----	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A/VA	0.010	µg/L	<0.010	----	----	----	----
Methylnaphthalene, 1-	90-12-0	E641A/VA	0.010	µg/L	<0.010	----	----	----	----
Methylnaphthalene, 2-	91-57-6	E641A/VA	0.010	µg/L	<0.010	----	----	----	----
Naphthalene	91-20-3	E641A/VA	0.050	µg/L	<0.050	----	----	----	----
Phenanthrene	85-01-8	E641A/VA	0.020	µg/L	<0.020	----	----	----	----
Pyrene	129-00-0	E641A/VA	0.010	µg/L	<0.010	----	----	----	----
Quinoline	91-22-5	E641A/VA	0.050	µg/L	<0.050	----	----	----	----
Polycyclic Aromatic Hydrocarbons Surrogates									
Chrysene-d12	1719-03-5	E641A/VA	0.1	%	111	----	----	----	----
Naphthalene-d8	1146-65-2	E641A/VA	0.1	%	96.0	----	----	----	----
Phenanthrene-d10	1517-22-2	E641A/VA	0.1	%	108	----	----	----	----
Glycols									
Diethylene glycol	111-46-6	E680E/VA	5.0	mg/L	<5.0	----	----	----	----
Ethylene glycol	107-21-1	E680E/VA	5.0	mg/L	<5.0	----	----	----	----
Propylene glycol, 1,2-	57-55-6	E680E/VA	5.0	mg/L	<5.0	----	----	----	----
Triethylene glycol	112-27-6	E680E/VA	5.0	mg/L	<5.0	----	----	----	----
Glycols, total (EG+DEG+PG)	----	E680E/VA	10	mg/L	<10	----	----	----	----
Glycols Surrogates									
Propanediol, 1,3-	504-63-2	E680E/VA	1.0	%	81.2	----	----	----	----

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.

VA24A5021_0_QC (CAN):

ALS Canada Ltd.

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QUALITY CONTROL REPORT

Work Order	: **VA24A5021**	Page	: 1 of 23
Client	: Frontier-Kemper Michels Joint Venture	Laboratory	: ALS Environmental - Vancouver
Contact	: Sara Derakhshi	Account Manager	: Thomas Chang
Address	: 404-850 Harbourside Drive North Vancouver BC Canada V7P 0A3	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	:	Telephone	: +1 604 253 4188
Project	: EGP 150	Date Samples Received	: 11-Mar-2024 14:15
PO	: ----	Date Analysis Commenced	: 11-Mar-2024
C-O-C number	: 23-1084264	Issue Date	: 14-Mar-2024 16:23
Sampler	: ---- ----		
Site	: BC Rail		
Quote number	: WTP Dishcarge		
No. of samples received	: 1		
No. of samples analysed	: 1		

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.

Signatories	*Position*	*Laboratory Department*
Angelo Salandanan	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Janice Leung	Supervisor - Organics Instrumentation	Vancouver Organics, Burnaby, British Columbia
Kate Dimitrova	Supervisor - Inorganic	Vancouver Inorganics, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Vancouver Metals, Burnaby, British Columbia
Leon Yang	Analyst	Vancouver Inorganics, Burnaby, British Columbia
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Paul Cushing	Team Leader - Organics	Vancouver Organics, Burnaby, British Columbia
Tracy Harley	Supervisor - Water Quality Instrumentation	Vancouver Inorganics, Burnaby, British Columbia
Virginia Smith	Account Manager Assistant	Vancouver Administration, 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: 1362042)											
VA24A5021-001	WTP Discharge	pH	----	E108	0.10	pH units	8.32	8.39	0.838%	4%	----
Physical Tests (QC Lot: 1362043)											
VA24A5021-001	WTP Discharge	Alkalinity, bicarbonate (as CaCO3)	----	E290	2.0	mg/L	221	229	3.36%	20%	----
		Alkalinity, carbonate (as CaCO3)	----	E290	2.0	mg/L	4.8	6.9	34.5%	20%	----
		Alkalinity, hydroxide (as CaCO3)	----	E290	2.0	mg/L	<2.0	<2.0	0.00%	20%	----
		Alkalinity, phenolphthalein (as CaCO3)	----	E290	2.0	mg/L	2.4	3.4	1.0	Diff <2x LOR	----
		Alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	226	236	4.15%	20%	----
Physical Tests (QC Lot: 1362044)											
VA24A5021-001	WTP Discharge	Conductivity	----	E100	2.0	µS/cm	521	522	0.192%	10%	----
Physical Tests (QC Lot: 1362324)											
VA24A5019-001	Anonymous	Solids, total dissolved [TDS]	----	E162	20	mg/L	204	192	12	Diff <2x LOR	----
Physical Tests (QC Lot: 1362325)											
VA24A5019-001	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	6.2	6.6	0.4	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1362045)											
VA24A5019-001	Anonymous	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.101	0.097	0.003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1362046)											
VA24A5019-001	Anonymous	Chloride	16887-00-6	E235.Cl	0.50	mg/L	1.28	1.22	0.06	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1362047)											
VA24A5019-001	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: 1362048)											
VA24A5019-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.719	0.691	3.94%	20%	----
Anions and Nutrients (QC Lot: 1362049)											
VA24A5019-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0473	0.0456	3.69%	20%	----
Anions and Nutrients (QC Lot: 1362050)											
VA24A5019-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	23.2	22.4	3.42%	20%	----
Anions and Nutrients (QC Lot: 1362174)											
VA24A5021-001	WTP Discharge	Nitrogen, total	7727-37-9	E366	0.150	mg/L	2.27	2.30	1.09%	20%	----
Anions and Nutrients (QC Lot: 1362176)											
VA24A5021-001	WTP Discharge	Ammonia, total (as N)	7664-41-7	E298	0.0250	mg/L	1.20	1.20	0.084%	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*
Organic / Inorganic Carbon (QC Lot: 1362172)											
VA24A5019-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	5.34	5.00	6.44%	20%	----
Organic / Inorganic Carbon (QC Lot: 1362173)											
VA24A5019-001	Anonymous	Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	5.02	4.61	0.41	Diff <2x LOR	----
Total Metals (QC Lot: 1362238)											
VA24A5019-001	Anonymous	Aluminum, total	7429-90-5	E420	0.0030	mg/L	0.662	0.680	2.67%	20%	----
		Antimony, total	7440-36-0	E420	0.00010	mg/L	0.00051	0.00051	0.000006	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00255	0.00264	3.76%	20%	----
		Barium, total	7440-39-3	E420	0.00010	mg/L	0.0551	0.0561	1.77%	20%	----
		Beryllium, total	7440-41-7	E420	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		Bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Boron, total	7440-42-8	E420	0.010	mg/L	0.023	0.023	0.0004	Diff <2x LOR	----
		Cadmium, total	7440-43-9	E420	0.0000300	mg/L	<0.0000300	<0.0000300	0	Diff <2x LOR	----
		Calcium, total	7440-70-2	E420	0.050	mg/L	91.6	91.9	0.288%	20%	----
		Cesium, total	7440-46-2	E420	0.000010	mg/L	0.000058	0.000058	0.000000002	Diff <2x LOR	----
		Chromium, total	7440-47-3	E420	0.00050	mg/L	0.0258	0.0265	2.53%	20%	----
		Cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00033	0.00035	0.00002	Diff <2x LOR	----
		Copper, total	7440-50-8	E420	0.00050	mg/L	0.0171	0.0176	2.81%	20%	----
		Iron, total	7439-89-6	E420	0.010	mg/L	0.246	0.256	4.65%	20%	----
		Lead, total	7439-92-1	E420	0.000050	mg/L	0.000745	0.000753	1.08%	20%	----
		Lithium, total	7439-93-2	E420	0.0010	mg/L	0.0013	0.0013	0.00002	Diff <2x LOR	----
		Magnesium, total	7439-95-4	E420	0.100	mg/L	0.248	0.252	0.0038	Diff <2x LOR	----
		Manganese, total	7439-96-5	E420	0.00010	mg/L	0.00759	0.00793	4.40%	20%	----
		Molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.0525	0.0526	0.129%	20%	----
		Nickel, total	7440-02-0	E420	0.00050	mg/L	0.00070	0.00076	0.00005	Diff <2x LOR	----
		Phosphorus, total	7723-14-0	E420	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Potassium, total	7440-09-7	E420	0.100	mg/L	2.39	2.44	2.16%	20%	----
		Rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00474	0.00492	3.58%	20%	----
		Selenium, total	7782-49-2	E420	0.000050	mg/L	0.000472	0.000584	17.7%	20%	----
		Silicon, total	7440-21-3	E420	0.10	mg/L	18.7	18.9	1.16%	20%	----
		Silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, total	7440-23-5	E420	0.050	mg/L	3.90	4.00	2.43%	20%	----
		Strontium, total	7440-24-6	E420	0.00020	mg/L	0.325	0.326	0.304%	20%	----
		Sulfur, total	7704-34-9	E420	0.50	mg/L	8.54	8.42	1.38%	20%	----
		Tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----

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: 1362238) - continued											
VA24A5019-001	Anonymous	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	0.00018	0.00019	0.000003	Diff <2x LOR	----
		Titanium, total	7440-32-6	E420	0.00030	mg/L	0.0162	0.0167	2.89%	20%	----
		Tungsten, total	7440-33-7	E420	0.00010	mg/L	0.00043	0.00045	0.00002	Diff <2x LOR	----
		Uranium, total	7440-61-1	E420	0.000010	mg/L	0.000110	0.000112	2.52%	20%	----
		Vanadium, total	7440-62-2	E420	0.00050	mg/L	0.00663	0.00677	1.67%	20%	----
		Zinc, total	7440-66-6	E420	0.0030	mg/L	0.0044	0.0046	0.0002	Diff <2x LOR	----
		Zirconium, total	7440-67-7	E420	0.00020	mg/L	0.00029	0.00024	0.00005	Diff <2x LOR	----
Total Metals (QC Lot: 1362338)											
FJ2400672-001	Anonymous	Mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 1362339)											
VA24A5021-001	WTP Discharge	Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0016	0.0019	0.0003	Diff <2x LOR	----
		Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00070	0.00069	0.000009	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00040	0.00041	0.000003	Diff <2x LOR	----
		Barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.00130	0.00134	3.15%	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	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Boron, dissolved	7440-42-8	E421	0.010	mg/L	0.020	0.020	0.0001	Diff <2x LOR	----
		Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.050	mg/L	0.469	0.484	0.005	Diff <2x LOR	----
		Cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000209	0.000203	2.84%	20%	----
		Chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00078	0.00077	0.000008	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.010	mg/L	0.019	0.019	0.0003	Diff <2x LOR	----
		Lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0049	0.0048	0.00006	Diff <2x LOR	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	0.0186	0.0175	0.0012	Diff <2x LOR	----
		Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00630	0.00646	2.48%	20%	----
		Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00636	0.00628	1.39%	20%	----
		Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
		Potassium, dissolved	7440-09-7	E421	0.050	mg/L	6.76	7.07	4.49%	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: 1362339) - continued											
VA24A5021-001	WTP Discharge	Rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.0131	0.0138	5.51%	20%	----
		Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000068	0.000100	0.000032	Diff <2x LOR	----
		Silicon, dissolved	7440-21-3	E421	0.050	mg/L	4.33	4.46	2.91%	20%	----
		Silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, dissolved	7440-23-5	E421	0.050	mg/L	112	117	4.33%	20%	----
		Strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.00114	0.00112	0.00002	Diff <2x LOR	----
		Sulfur, dissolved	7704-34-9	E421	0.50	mg/L	6.12	6.24	1.89%	20%	----
		Tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		Tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Uranium, dissolved	7440-61-1	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0066	0.0070	0.0003	Diff <2x LOR	----
		Zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 1362342)											
VA24A4647-001	Anonymous	Mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0050 µg/L	<0.0000050	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 1366148)											
RG2400318-001	Anonymous	Phenols, total (4AAP)	----	E562	0.0010	mg/L	0.0051	0.0053	0.0002	Diff <2x LOR	----
Volatile Organic Compounds (QC Lot: 1362349)											
VA24A5019-001	Anonymous	Benzene	71-43-2	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Bromodichloromethane	75-27-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Bromoform	75-25-2	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Carbon tetrachloride	56-23-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Chlorobenzene	108-90-7	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Chloroethane	75-00-3	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Chloroform	67-66-3	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Chloromethane	74-87-3	E611C	5.0	µg/L	<5.0	<5.0	0	Diff <2x LOR	----
		Dibromochloromethane	124-48-1	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorobenzene, 1,2-	95-50-1	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorobenzene, 1,3-	541-73-1	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichlorobenzene, 1,4-	106-46-7	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----

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*
Volatile Organic Compounds (QC Lot: 1362349) - continued											
VA24A5019-001	Anonymous	Dichloroethane, 1,1-	75-34-3	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloroethane, 1,2-	107-06-2	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloroethylene, 1,1-	75-35-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloroethylene, cis-1,2-	156-59-2	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloroethylene, trans-1,2-	156-60-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloromethane	75-09-2	E611C	1.0	µg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Dichloropropane, 1,2-	78-87-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloropropylene, cis-1,3-	10061-01-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Dichloropropylene, trans-1,3-	10061-02-6	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Styrene	100-42-5	E611C	0.50	µg/L	2.07	2.00	0.07	Diff <2x LOR	----
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611C	0.20	µg/L	<0.20	<0.20	0	Diff <2x LOR	----
		Tetrachloroethylene	127-18-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Toluene	108-88-3	E611C	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		Trichloroethane, 1,1,1-	71-55-6	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Trichloroethane, 1,1,2-	79-00-5	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Trichloroethylene	79-01-6	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Trichlorofluoromethane	75-69-4	E611C	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Vinyl chloride	75-01-4	E611C	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611C	0.40	µg/L	1.04	1.01	0.03	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611C	0.30	µg/L	0.46	0.44	0.02	Diff <2x LOR	----
Glycols (QC Lot: 1362071)											
VA24A5019-001	Anonymous	Diethylene glycol	111-46-6	E680E	5.0	mg/L	<5.0	<5.0	0	Diff <2x LOR	----
		Ethylene glycol	107-21-1	E680E	5.0	mg/L	<5.0	<5.0	0	Diff <2x LOR	----
		Propylene glycol, 1,2-	57-55-6	E680E	5.0	mg/L	<5.0	<5.0	0	Diff <2x LOR	----
		Triethylene glycol	112-27-6	E680E	5.0	mg/L	<5.0	<5.0	0	Diff <2x LOR	----

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: 1362043)						
Alkalinity, bicarbonate (as CaCO3)	----	E290	1	mg/L	<1.0	----
Alkalinity, carbonate (as CaCO3)	----	E290	1	mg/L	<1.0	----
Alkalinity, hydroxide (as CaCO3)	----	E290	1	mg/L	<1.0	----
Alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	<1.0	----
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 1362044)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 1362324)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 1362325)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 1362045)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1362046)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 1362047)						
Bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 1362048)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1362049)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 1362050)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 1362174)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 1362176)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Organic / Inorganic Carbon (QCLot: 1362172)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 1362173)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Total Metals (QCLot: 1362238)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 1362238) - continued						
Aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	---
Antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	---
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	---

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 1362238) - continued						
Uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	---
Vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	---
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: 1362338)						
Mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	---
Dissolved Metals (QCLot: 1362339)						
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: 1362339) - 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: 1362342)						
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	---
Aggregate Organics (QCLot: 1366149)						
Phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	---
Volatile Organic Compounds (QCLot: 1362349)						
Benzene	71-43-2	E611C	0.5	µg/L	<0.50	---
Bromodichloromethane	75-27-4	E611C	0.5	µg/L	<0.50	---
Bromoform	75-25-2	E611C	0.5	µg/L	<0.50	---
Carbon tetrachloride	56-23-5	E611C	0.5	µg/L	<0.50	---
Chlorobenzene	108-90-7	E611C	0.5	µg/L	<0.50	---
Chloroethane	75-00-3	E611C	0.5	µg/L	<0.50	---
Chloroform	67-66-3	E611C	0.5	µg/L	<0.50	---
Chloromethane	74-87-3	E611C	5	µg/L	<5.0	---
Dibromochloromethane	124-48-1	E611C	0.5	µg/L	<0.50	---
Dichlorobenzene, 1,2-	95-50-1	E611C	0.5	µg/L	<0.50	---
Dichlorobenzene, 1,3-	541-73-1	E611C	0.5	µg/L	<0.50	---
Dichlorobenzene, 1,4-	106-46-7	E611C	0.5	µg/L	<0.50	---
Dichloroethane, 1,1-	75-34-3	E611C	0.5	µg/L	<0.50	---
Dichloroethane, 1,2-	107-06-2	E611C	0.5	µg/L	<0.50	---
Dichloroethylene, 1,1-	75-35-4	E611C	0.5	µg/L	<0.50	---
Dichloroethylene, cis-1,2-	156-59-2	E611C	0.5	µg/L	<0.50	---
Dichloroethylene, trans-1,2-	156-60-5	E611C	0.5	µg/L	<0.50	---
Dichloromethane	75-09-2	E611C	1	µg/L	<1.0	---
Dichloropropane, 1,2-	78-87-5	E611C	0.5	µg/L	<0.50	---

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Volatile Organic Compounds (QCLot: 1362349) - continued						
Dichloropropylene, cis-1,3-	10061-01-5	E611C	0.5	µg/L	<0.50	---
Dichloropropylene, trans-1,3-	10061-02-6	E611C	0.5	µg/L	<0.50	---
Ethylbenzene	100-41-4	E611C	0.5	µg/L	<0.50	---
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611C	0.5	µg/L	<0.50	---
Styrene	100-42-5	E611C	0.5	µg/L	<0.50	---
Tetrachloroethane, 1,1,1,2-	630-20-6	E611C	0.5	µg/L	<0.50	---
Tetrachloroethane, 1,1,2,2-	79-34-5	E611C	0.2	µg/L	<0.20	---
Tetrachloroethylene	127-18-4	E611C	0.5	µg/L	<0.50	---
Toluene	108-88-3	E611C	0.4	µg/L	<0.40	---
Trichloroethane, 1,1,1-	71-55-6	E611C	0.5	µg/L	<0.50	---
Trichloroethane, 1,1,2-	79-00-5	E611C	0.5	µg/L	<0.50	---
Trichloroethylene	79-01-6	E611C	0.5	µg/L	<0.50	---
Trichlorofluoromethane	75-69-4	E611C	0.5	µg/L	<0.50	---
Vinyl chloride	75-01-4	E611C	0.4	µg/L	<0.40	---
Xylene, m+p-	179601-23-1	E611C	0.4	µg/L	<0.40	---
Xylene, o-	95-47-6	E611C	0.3	µg/L	<0.30	---
Hydrocarbons (QCLot: 1362274)						
EPH (C10-C19)	----	E601A	250	µg/L	<250	---
EPH (C19-C32)	----	E601A	250	µg/L	<250	---
Hydrocarbons (QCLot: 1364557)						
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	---
Polycyclic Aromatic Hydrocarbons (QCLot: 1362275)						
Acenaphthene	83-32-9	E641A	0.01	µg/L	<0.010	---
Acenaphthylene	208-96-8	E641A	0.01	µg/L	<0.010	---
Acridine	260-94-6	E641A	0.01	µg/L	<0.010	---
Anthracene	120-12-7	E641A	0.01	µg/L	<0.010	---
Benz(a)anthracene	56-55-3	E641A	0.01	µg/L	<0.010	---
Benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	<0.0050	---
Benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	<0.010	---
Benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	<0.010	---
Benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	<0.010	---
Chrysene	218-01-9	E641A	0.01	µg/L	<0.010	---
Dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	<0.0050	---
Fluoranthene	206-44-0	E641A	0.01	µg/L	<0.010	---
Fluorene	86-73-7	E641A	0.01	µg/L	<0.010	---

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 1362275) - continued						
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	<0.010	---
Methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	<0.010	---
Methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	<0.010	---
Naphthalene	91-20-3	E641A	0.05	µg/L	<0.050	---
Phenanthrene	85-01-8	E641A	0.02	µg/L	<0.020	---
Pyrene	129-00-0	E641A	0.01	µg/L	<0.010	---
Quinoline	91-22-5	E641A	0.05	µg/L	<0.050	---
Glycols (QCLot: 1362071)						
Diethylene glycol	111-46-6	E680E	5	mg/L	<5.0	---
Ethylene glycol	107-21-1	E680E	5	mg/L	<5.0	---
Propylene glycol, 1,2-	57-55-6	E680E	5	mg/L	<5.0	---
Triethylene glycol	112-27-6	E680E	5	mg/L	<5.0	---

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				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1362042)									
pH	---	E108	---	pH units	7 pH units	100	98.0	102	---
Physical Tests (QCLot: 1362043)									
Alkalinity, phenolphthalein (as CaCO3)	---	E290	1	mg/L	229 mg/L	116	75.0	125	---
Alkalinity, total (as CaCO3)	---	E290	1	mg/L	500 mg/L	107	85.0	115	---
Physical Tests (QCLot: 1362044)									
Conductivity	---	E100	1	µS/cm	146.9 µS/cm	99.7	90.0	110	---
Physical Tests (QCLot: 1362324)									
Solids, total dissolved [TDS]	---	E162	10	mg/L	1000 mg/L	105	85.0	115	---
Physical Tests (QCLot: 1362325)									
Solids, total suspended [TSS]	---	E160	3	mg/L	150 mg/L	87.0	85.0	115	---
Anions and Nutrients (QCLot: 1362045)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	98.1	90.0	110	---
Anions and Nutrients (QCLot: 1362046)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	101	90.0	110	---
Anions and Nutrients (QCLot: 1362047)									
Bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	98.8	85.0	115	---
Anions and Nutrients (QCLot: 1362048)									
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: 1362049)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	100	90.0	110	---
Anions and Nutrients (QCLot: 1362050)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	102	90.0	110	---
Anions and Nutrients (QCLot: 1362174)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	97.7	75.0	125	---
Anions and Nutrients (QCLot: 1362176)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	98.1	85.0	115	---
Organic / Inorganic Carbon (QCLot: 1362172)									
Carbon, dissolved organic [DOC]	---	E358-L	0.5	mg/L	8.57 mg/L	96.1	80.0	120	---
Organic / Inorganic Carbon (QCLot: 1362173)									
Carbon, total organic [TOC]	---	E355-L	0.5	mg/L	8.57 mg/L	100	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: 1362238)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	111	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	109	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	113	80.0	120	----
Barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	113	80.0	120	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	107	80.0	120	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	105	80.0	120	----
Boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	103	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	115	80.0	120	----
Calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	106	80.0	120	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	109	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	113	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	112	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	110	80.0	120	----
Iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	116	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	107	80.0	120	----
Lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	108	80.0	120	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	112	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	110	80.0	120	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	106	80.0	120	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	111	80.0	120	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	116	80.0	120	----
Potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	112	80.0	120	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	112	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	118	80.0	120	----
Silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	# 122	80.0	120	MES
Silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	102	80.0	120	----
Sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	112	80.0	120	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	106	80.0	120	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	108	80.0	120	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	106	80.0	120	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	107	80.0	120	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	108	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	107	80.0	120	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	106	80.0	120	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	108	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Total Metals (QCLot: 1362238) - continued									
Uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	112	80.0	120	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	113	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	110	80.0	120	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	105	80.0	120	----
Total Metals (QCLot: 1362338)									
Mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	101	80.0	120	----
Dissolved Metals (QCLot: 1362339)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	106	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	102	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	108	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	106	80.0	120	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	104	80.0	120	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	99.6	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	102	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	105	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	103	80.0	120	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	105	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	106	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	107	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	105	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	105	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	108	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	107	80.0	120	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	103	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	105	80.0	120	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	109	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	106	80.0	120	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	109	80.0	120	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	115	80.0	120	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	97.4	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	105	80.0	120	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	102	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Dissolved Metals (QCLot: 1362339) - continued									
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	105	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	102	80.0	120	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	101	80.0	120	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	103	80.0	120	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	105	80.0	120	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	104	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	104	80.0	120	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	107	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	104	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	103	80.0	120	----
Aggregate Organics (QCLot: 1366149)									
Phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	99.4	85.0	115	----
Volatile Organic Compounds (QCLot: 1362349)									
Benzene	71-43-2	E611C	0.5	µg/L	100 µg/L	110	70.0	130	----
Bromodichloromethane	75-27-4	E611C	0.5	µg/L	100 µg/L	105	70.0	130	----
Bromoform	75-25-2	E611C	0.5	µg/L	100 µg/L	95.9	70.0	130	----
Carbon tetrachloride	56-23-5	E611C	0.5	µg/L	100 µg/L	120	70.0	130	----
Chlorobenzene	108-90-7	E611C	0.5	µg/L	100 µg/L	108	70.0	130	----
Chloroethane	75-00-3	E611C	0.5	µg/L	100 µg/L	120	60.0	140	----
Chloroform	67-66-3	E611C	0.5	µg/L	100 µg/L	109	70.0	130	----
Chloromethane	74-87-3	E611C	5	µg/L	100 µg/L	127	60.0	140	----
Dibromochloromethane	124-48-1	E611C	0.5	µg/L	100 µg/L	98.4	70.0	130	----
Dichlorobenzene, 1,2-	95-50-1	E611C	0.5	µg/L	100 µg/L	103	70.0	130	----
Dichlorobenzene, 1,3-	541-73-1	E611C	0.5	µg/L	100 µg/L	108	70.0	130	----
Dichlorobenzene, 1,4-	106-46-7	E611C	0.5	µg/L	100 µg/L	109	70.0	130	----
Dichloroethane, 1,1-	75-34-3	E611C	0.5	µg/L	100 µg/L	110	70.0	130	----
Dichloroethane, 1,2-	107-06-2	E611C	0.5	µg/L	100 µg/L	100	70.0	130	----
Dichloroethylene, 1,1-	75-35-4	E611C	0.5	µg/L	100 µg/L	114	70.0	130	----
Dichloroethylene, cis-1,2-	156-59-2	E611C	0.5	µg/L	100 µg/L	104	70.0	130	----
Dichloroethylene, trans-1,2-	156-60-5	E611C	0.5	µg/L	100 µg/L	114	70.0	130	----
Dichloromethane	75-09-2	E611C	1	µg/L	100 µg/L	108	70.0	130	----
Dichloropropane, 1,2-	78-87-5	E611C	0.5	µg/L	100 µg/L	103	70.0	130	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Volatile Organic Compounds (QCLot: 1362349) - continued									
Dichloropropylene, cis-1,3-	10061-01-5	E611C	0.5	µg/L	100 µg/L	120	70.0	130	----
Dichloropropylene, trans-1,3-	10061-02-6	E611C	0.5	µg/L	100 µg/L	125	70.0	130	----
Ethylbenzene	100-41-4	E611C	0.5	µg/L	100 µg/L	102	70.0	130	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611C	0.5	µg/L	100 µg/L	110	70.0	130	----
Styrene	100-42-5	E611C	0.5	µg/L	100 µg/L	104	70.0	130	----
Tetrachloroethane, 1,1,1,2-	630-20-6	E611C	0.5	µg/L	100 µg/L	103	70.0	130	----
Tetrachloroethane, 1,1,2,2-	79-34-5	E611C	0.2	µg/L	100 µg/L	85.5	70.0	130	----
Tetrachloroethylene	127-18-4	E611C	0.5	µg/L	100 µg/L	110	70.0	130	----
Toluene	108-88-3	E611C	0.4	µg/L	100 µg/L	108	70.0	130	----
Trichloroethane, 1,1,1-	71-55-6	E611C	0.5	µg/L	100 µg/L	127	70.0	130	----
Trichloroethane, 1,1,2-	79-00-5	E611C	0.5	µg/L	100 µg/L	93.1	70.0	130	----
Trichloroethylene	79-01-6	E611C	0.5	µg/L	100 µg/L	108	70.0	130	----
Trichlorofluoromethane	75-69-4	E611C	0.5	µg/L	100 µg/L	140	60.0	140	----
Vinyl chloride	75-01-4	E611C	0.4	µg/L	100 µg/L	131	60.0	140	----
Xylene, m+p-	179601-23-1	E611C	0.4	µg/L	200 µg/L	114	70.0	130	----
Xylene, o-	95-47-6	E611C	0.3	µg/L	100 µg/L	101	70.0	130	----
Hydrocarbons (QCLot: 1362274)									
EPH (C10-C19)	----	E601A	250	µg/L	6491 µg/L	111	70.0	130	----
EPH (C19-C32)	----	E601A	250	µg/L	3363 µg/L	108	70.0	130	----
Hydrocarbons (QCLot: 1364557)									
VH-hw (C6-C10)	----	E581.VH+F1	100	µg/L	6310 µg/L	83.7	70.0	130	----
Polycyclic Aromatic Hydrocarbons (QCLot: 1362275)									
Acenaphthene	83-32-9	E641A	0.01	µg/L	0.5 µg/L	118	60.0	130	----
Acenaphthylene	208-96-8	E641A	0.01	µg/L	0.5 µg/L	126	60.0	130	----
Acridine	260-94-6	E641A	0.01	µg/L	0.5 µg/L	109	60.0	130	----
Anthracene	120-12-7	E641A	0.01	µg/L	0.5 µg/L	123	60.0	130	----
Benz(a)anthracene	56-55-3	E641A	0.01	µg/L	0.5 µg/L	125	60.0	130	----
Benzo(a)pyrene	50-32-8	E641A	0.005	µg/L	0.5 µg/L	115	60.0	130	----
Benzo(b+j)fluoranthene	n/a	E641A	0.01	µg/L	0.5 µg/L	117	60.0	130	----
Benzo(g,h,i)perylene	191-24-2	E641A	0.01	µg/L	0.5 µg/L	121	60.0	130	----
Benzo(k)fluoranthene	207-08-9	E641A	0.01	µg/L	0.5 µg/L	112	60.0	130	----
Chrysene	218-01-9	E641A	0.01	µg/L	0.5 µg/L	126	60.0	130	----
Dibenz(a,h)anthracene	53-70-3	E641A	0.005	µg/L	0.5 µg/L	127	60.0	130	----
Fluoranthene	206-44-0	E641A	0.01	µg/L	0.5 µg/L	118	60.0	130	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Polycyclic Aromatic Hydrocarbons (QCLot: 1362275) - continued									
Fluorene	86-73-7	E641A	0.01	µg/L	0.5 µg/L	117	60.0	130	----
Indeno(1,2,3-c,d)pyrene	193-39-5	E641A	0.01	µg/L	0.5 µg/L	127	60.0	130	----
Methylnaphthalene, 1-	90-12-0	E641A	0.01	µg/L	0.5 µg/L	110	60.0	130	----
Methylnaphthalene, 2-	91-57-6	E641A	0.01	µg/L	0.5 µg/L	120	60.0	130	----
Naphthalene	91-20-3	E641A	0.05	µg/L	0.5 µg/L	113	50.0	130	----
Phenanthrene	85-01-8	E641A	0.02	µg/L	0.5 µg/L	119	60.0	130	----
Pyrene	129-00-0	E641A	0.01	µg/L	0.5 µg/L	119	60.0	130	----
Quinoline	91-22-5	E641A	0.05	µg/L	0.5 µg/L	108	60.0	130	----
Glycols (QCLot: 1362071)									
Diethylene glycol	111-46-6	E680E	5	mg/L	25 mg/L	94.2	70.0	130	----
Ethylene glycol	107-21-1	E680E	5	mg/L	25 mg/L	94.4	70.0	130	----
Propylene glycol, 1,2-	57-55-6	E680E	5	mg/L	25 mg/L	88.9	70.0	130	----
Triethylene glycol	112-27-6	E680E	5	mg/L	25 mg/L	93.6	70.0	130	----

Qualifiers

Qualifier	Description
MES	Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).

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: 1362045)										
VA24A5019-002	Anonymous	Fluoride	16984-48-8	E235.F	1.03 mg/L	1 mg/L	103	75.0	125	---
Anions and Nutrients (QCLot: 1362046)										
VA24A5019-002	Anonymous	Chloride	16887-00-6	E235.Cl	99.3 mg/L	100 mg/L	99.3	75.0	125	---
Anions and Nutrients (QCLot: 1362047)										
VA24A5019-002	Anonymous	Bromide	24959-67-9	E235.Br-L	0.505 mg/L	0.5 mg/L	101	75.0	125	---
Anions and Nutrients (QCLot: 1362048)										
VA24A5019-002	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	2.50 mg/L	2.5 mg/L	100	75.0	125	---
Anions and Nutrients (QCLot: 1362049)										
VA24A5019-002	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.502 mg/L	0.5 mg/L	100	75.0	125	---
Anions and Nutrients (QCLot: 1362050)										
VA24A5019-002	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	103 mg/L	100 mg/L	103	75.0	125	---
Organic / Inorganic Carbon (QCLot: 1362172)										
VA24A5019-002	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	4.55 mg/L	5 mg/L	90.9	70.0	130	---
Organic / Inorganic Carbon (QCLot: 1362173)										
VA24A5019-002	Anonymous	Carbon, total organic [TOC]	----	E355-L	ND mg/L	5 mg/L	ND	70.0	130	---
Total Metals (QCLot: 1362238)										
VA24A5019-002	Anonymous	Aluminum, total	7429-90-5	E420	ND mg/L	0.4 mg/L	ND	70.0	130	---
		Antimony, total	7440-36-0	E420	0.0395 mg/L	0.04 mg/L	98.8	70.0	130	---
		Arsenic, total	7440-38-2	E420	0.0406 mg/L	0.04 mg/L	101	70.0	130	---
		Barium, total	7440-39-3	E420	ND mg/L	0.04 mg/L	ND	70.0	130	---
		Beryllium, total	7440-41-7	E420	0.0764 mg/L	0.08 mg/L	95.6	70.0	130	---
		Bismuth, total	7440-69-9	E420	0.0190 mg/L	0.02 mg/L	95.2	70.0	130	---
		Boron, total	7440-42-8	E420	0.192 mg/L	0.2 mg/L	96.0	70.0	130	---
		Cadmium, total	7440-43-9	E420	0.00794 mg/L	0.008 mg/L	99.2	70.0	130	---
		Calcium, total	7440-70-2	E420	ND mg/L	8 mg/L	ND	70.0	130	---
		Cesium, total	7440-46-2	E420	0.0198 mg/L	0.02 mg/L	98.8	70.0	130	---
		Chromium, total	7440-47-3	E420	0.0784 mg/L	0.08 mg/L	98.0	70.0	130	---
		Cobalt, total	7440-48-4	E420	0.0392 mg/L	0.04 mg/L	98.1	70.0	130	---
		Copper, total	7440-50-8	E420	0.0377 mg/L	0.04 mg/L	94.2	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: 1362238) - continued										
VA24A5019-002	Anonymous	Iron, total	7439-89-6	E420	ND mg/L	4 mg/L	ND	70.0	130	---
		Lead, total	7439-92-1	E420	0.0355 mg/L	0.04 mg/L	88.8	70.0	130	---
		Lithium, total	7439-93-2	E420	0.193 mg/L	0.2 mg/L	96.5	70.0	130	---
		Magnesium, total	7439-95-4	E420	ND mg/L	2 mg/L	ND	70.0	130	---
		Manganese, total	7439-96-5	E420	ND mg/L	0.04 mg/L	ND	70.0	130	---
		Molybdenum, total	7439-98-7	E420	0.0389 mg/L	0.04 mg/L	97.3	70.0	130	---
		Nickel, total	7440-02-0	E420	0.0779 mg/L	0.08 mg/L	97.4	70.0	130	---
		Phosphorus, total	7723-14-0	E420	19.6 mg/L	20 mg/L	97.8	70.0	130	---
		Potassium, total	7440-09-7	E420	7.78 mg/L	8 mg/L	97.2	70.0	130	---
		Rubidium, total	7440-17-7	E420	0.0386 mg/L	0.04 mg/L	96.5	70.0	130	---
		Selenium, total	7782-49-2	E420	0.0838 mg/L	0.08 mg/L	105	70.0	130	---
		Silicon, total	7440-21-3	E420	ND mg/L	20 mg/L	ND	70.0	130	---
		Silver, total	7440-22-4	E420	0.00785 mg/L	0.008 mg/L	98.1	70.0	130	---
		Sodium, total	7440-23-5	E420	ND mg/L	4 mg/L	ND	70.0	130	---
		Strontium, total	7440-24-6	E420	ND mg/L	0.04 mg/L	ND	70.0	130	---
		Sulfur, total	7704-34-9	E420	41.0 mg/L	40 mg/L	103	70.0	130	---
		Tellurium, total	13494-80-9	E420	0.0787 mg/L	0.08 mg/L	98.4	70.0	130	---
		Thallium, total	7440-28-0	E420	0.00775 mg/L	0.008 mg/L	96.9	70.0	130	---
		Thorium, total	7440-29-1	E420	0.0378 mg/L	0.04 mg/L	94.4	70.0	130	---
		Tin, total	7440-31-5	E420	0.0393 mg/L	0.04 mg/L	98.2	70.0	130	---
		Titanium, total	7440-32-6	E420	ND mg/L	0.08 mg/L	ND	70.0	130	---
		Tungsten, total	7440-33-7	E420	0.0390 mg/L	0.04 mg/L	97.6	70.0	130	---
		Uranium, total	7440-61-1	E420	0.00756 mg/L	0.008 mg/L	94.6	70.0	130	---
		Vanadium, total	7440-62-2	E420	0.196 mg/L	0.2 mg/L	98.3	70.0	130	---
		Zinc, total	7440-66-6	E420	0.768 mg/L	0.8 mg/L	96.0	70.0	130	---
		Zirconium, total	7440-67-7	E420	0.0784 mg/L	0.08 mg/L	97.9	70.0	130	---
Total Metals (QCLot: 1362338)										
FJ2400672-002	Anonymous	Mercury, total	7439-97-6	E508	0.000105 mg/L	0.0001 mg/L	105	70.0	130	---
Dissolved Metals (QCLot: 1362342)										
VA24A4841-001	Anonymous	Mercury, dissolved	7439-97-6	E509	0.000105 mg/L	0.0001 mg/L	105	70.0	130	---
Aggregate Organics (QCLot: 1366149)										
RG2400318-001	Anonymous	Phenols, total (4AAP)	----	E562	0.0196 mg/L	0.02 mg/L	99.2	75.0	125	---
Volatile Organic Compounds (QCLot: 1362349)										
VA24A5021-001	WTP Discharge	Benzene	71-43-2	E611C	109 µg/L	100 µg/L	109	60.0	140	---

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
Volatile Organic Compounds (QCLot: 1362349) - continued										
VA24A5021-001	WTP Discharge	Bromodichloromethane	75-27-4	E611C	102 µg/L	100 µg/L	102	60.0	140	---
		Bromoform	75-25-2	E611C	90.6 µg/L	100 µg/L	90.6	60.0	140	---
		Carbon tetrachloride	56-23-5	E611C	122 µg/L	100 µg/L	122	60.0	140	---
		Chlorobenzene	108-90-7	E611C	109 µg/L	100 µg/L	109	60.0	140	---
		Chloroethane	75-00-3	E611C	120 µg/L	100 µg/L	120	50.0	150	---
		Chloroform	67-66-3	E611C	108 µg/L	100 µg/L	108	60.0	140	---
		Chloromethane	74-87-3	E611C	127 µg/L	100 µg/L	127	50.0	150	---
		Dibromochloromethane	124-48-1	E611C	95.9 µg/L	100 µg/L	95.9	60.0	140	---
		Dichlorobenzene, 1,2-	95-50-1	E611C	102 µg/L	100 µg/L	102	60.0	140	---
		Dichlorobenzene, 1,3-	541-73-1	E611C	108 µg/L	100 µg/L	108	60.0	140	---
		Dichlorobenzene, 1,4-	106-46-7	E611C	108 µg/L	100 µg/L	108	60.0	140	---
		Dichloroethane, 1,1-	75-34-3	E611C	110 µg/L	100 µg/L	110	60.0	140	---
		Dichloroethane, 1,2-	107-06-2	E611C	95.8 µg/L	100 µg/L	95.8	60.0	140	---
		Dichloroethylene, 1,1-	75-35-4	E611C	116 µg/L	100 µg/L	116	60.0	140	---
		Dichloroethylene, cis-1,2-	156-59-2	E611C	102 µg/L	100 µg/L	102	60.0	140	---
		Dichloroethylene, trans-1,2-	156-60-5	E611C	113 µg/L	100 µg/L	113	60.0	140	---
		Dichloromethane	75-09-2	E611C	106 µg/L	100 µg/L	106	60.0	140	---
		Dichloropropane, 1,2-	78-87-5	E611C	100 µg/L	100 µg/L	100	60.0	140	---
		Dichloropropylene, cis-1,3-	10061-01-5	E611C	117 µg/L	100 µg/L	117	60.0	140	---
		Dichloropropylene, trans-1,3-	10061-02-6	E611C	124 µg/L	100 µg/L	124	60.0	140	---
		Ethylbenzene	100-41-4	E611C	104 µg/L	100 µg/L	104	60.0	140	---
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611C	108 µg/L	100 µg/L	108	60.0	140	---
		Styrene	100-42-5	E611C	103 µg/L	100 µg/L	103	60.0	140	---
		Tetrachloroethane, 1,1,1,2-	630-20-6	E611C	103 µg/L	100 µg/L	103	60.0	140	---
		Tetrachloroethane, 1,1,2,2-	79-34-5	E611C	80.7 µg/L	100 µg/L	80.7	60.0	140	---
		Tetrachloroethylene	127-18-4	E611C	114 µg/L	100 µg/L	114	60.0	140	---
		Toluene	108-88-3	E611C	110 µg/L	100 µg/L	110	60.0	140	---
		Trichloroethane, 1,1,1-	71-55-6	E611C	128 µg/L	100 µg/L	128	60.0	140	---
		Trichloroethane, 1,1,2-	79-00-5	E611C	90.0 µg/L	100 µg/L	90.0	60.0	140	---
		Trichloroethylene	79-01-6	E611C	109 µg/L	100 µg/L	109	60.0	140	---
		Trichlorofluoromethane	75-69-4	E611C	149 µg/L	100 µg/L	149	50.0	150	---
		Vinyl chloride	75-01-4	E611C	132 µg/L	100 µg/L	132	50.0	150	---
		Xylene, m+p-	179601-23-1	E611C	233 µg/L	200 µg/L	116	60.0	140	---
		Xylene, o-	95-47-6	E611C	102 µg/L	100 µg/L	102	60.0	140	---

VA24A5021_0_QCI (CAN):

ALS Canada Ltd.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	:**VA24A5021**	Page	: 1 of 15
Client	:**Frontier-Kemper Michels Joint Venture**	Laboratory	: ALS Environmental - Vancouver
Contact	:Sara Derakhshi	Account Manager	: Thomas Chang
Address	:404-850 Harbourside Drive North Vancouver BC Canada V7P 0A3	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	:----	Telephone	: +1 604 253 4188
Project	:EGP 150	Date Samples Received	: 11-Mar-2024 14:15
PO	:----	Issue Date	: 14-Mar-2024 16:23
C-O-C number	:23-1084264		
Sampler	:----		
Site	:BC Rail		
Quote number	:WTP Dishcarge		
No. of samples received	:1		
No. of samples analysed	:1		

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 Duplicate outliers occur.
- No Matrix Spike outliers occur.
- Laboratory Control Sample (LCS) 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)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- Quality Control Sample Frequency Outliers occur - please see following pages for full details.

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
Laboratory Control Sample (LCS) Recoveries								
Total Metals	QC-1362238-002	----	Silicon, total	7440-21-3	E420	122 % MES	80.0-120%	Recovery greater than upper control limit

Result Qualifiers

Qualifier	*Description*
MES	*Data Quality Objective was marginally exceeded (by < 10% absolute) for < 10% of analytes in a Multi-Element Scan / Multi-Parameter Scan (considered acceptable as per OMOE & CCME).*

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 Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid)										
WTP Discharge	E562	11-Mar-2024	14-Mar-2024	28 days	3 days	✓	14-Mar-2024	28 days	3 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid)										
WTP Discharge	E298	11-Mar-2024	11-Mar-2024	28 days	0 days	✓	12-Mar-2024	28 days	1 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE										
WTP Discharge	E235.Br-L	11-Mar-2024	11-Mar-2024	28 days	0 days	✓	11-Mar-2024	28 days	0 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
WTP Discharge	E235.Cl	11-Mar-2024	11-Mar-2024	28 days	0 days	✓	11-Mar-2024	28 days	0 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
WTP Discharge	E235.F	11-Mar-2024	11-Mar-2024	28 days	0 days	✓	11-Mar-2024	28 days	0 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE										
WTP Discharge	E235.NO3-L	11-Mar-2024	11-Mar-2024	3 days	0 days	✓	11-Mar-2024	3 days	0 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
WTP Discharge	E235.NO2-L	11-Mar-2024	11-Mar-2024	3 days	0 days	✓	11-Mar-2024	3 days	0 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 Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Sulfate in Water by IC										
HDPE WTP Discharge	E235.SO4	11-Mar-2024	11-Mar-2024	28 days	0 days	✓	11-Mar-2024	28 days	0 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) WTP Discharge	E366	11-Mar-2024	11-Mar-2024	28 days	0 days	✓	12-Mar-2024	28 days	1 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
HDPE - dissolved (lab preserved) WTP Discharge	E509	11-Mar-2024	12-Mar-2024	0 hrs	12 hrs	× UCP	12-Mar-2024	0 hrs	12 hrs	× UCP
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved) WTP Discharge	E421	11-Mar-2024	12-Mar-2024	180 days	1 days	✓	12-Mar-2024	180 days	1 days	✓
Field Tests : Field pH,EC,Salinity,Cl2,ClO2,ORP,DO, Turbidity,T,T-P,o-PO4,NH3,Chloramine										
HDPE - dissolved (lab preserved) WTP Discharge	EF001	11-Mar-2024	---	---	---		12-Mar-2024	---	1 days	
Glycols : Glycols (4 analytes) by GC-FID										
Glass vial (sodium bisulfate) WTP Discharge	E680E	11-Mar-2024	11-Mar-2024	14 days	0 days	✓	11-Mar-2024	40 days	0 days	✓
Hydrocarbons : BC PHCs - EPH by GC-FID										
Amber glass/Teflon lined cap (sodium bisulfate) WTP Discharge	E601A	11-Mar-2024	11-Mar-2024	14 days	0 days	✓	12-Mar-2024	40 days	0 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate) WTP Discharge	E581.VH+F1	11-Mar-2024	12-Mar-2024	14 days	1 days	✓	13-Mar-2024	14 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
HDPE WTP Discharge	E358-L	11-Mar-2024	11-Mar-2024	3 days	0 days	✓	11-Mar-2024	28 days	0 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 Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid)										
WTP Discharge	E355-L	11-Mar-2024	11-Mar-2024	28 days	0 days	✓	11-Mar-2024	28 days	0 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
WTP Discharge	E290	11-Mar-2024	11-Mar-2024	14 days	0 days	✓	12-Mar-2024	14 days	1 days	✓
Physical Tests : Conductivity in Water										
HDPE										
WTP Discharge	E100	11-Mar-2024	11-Mar-2024	28 days	0 days	✓	12-Mar-2024	28 days	1 days	✓
Physical Tests : pH by Meter										
HDPE										
WTP Discharge	E108	11-Mar-2024	11-Mar-2024	0.25 hrs	3 hrs	× EHTR-FM	12-Mar-2024	0.25 hrs	17 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE										
WTP Discharge	E162	11-Mar-2024	----	----	----		11-Mar-2024	7 days	0 days	✓
Physical Tests : TSS by Gravimetry										
HDPE										
WTP Discharge	E160	11-Mar-2024	----	----	----		11-Mar-2024	7 days	0 days	✓
Polycyclic Aromatic Hydrocarbons : PAHs by Hexane LVI GC-MS										
Amber glass/Teflon lined cap (sodium bisulfate)										
WTP Discharge	E641A	11-Mar-2024	11-Mar-2024	14 days	0 days	✓	12-Mar-2024	40 days	0 days	✓
Total Metals : Total Mercury in Water by CVAAS										
HDPE - total (lab preserved)										
WTP Discharge	E508	11-Mar-2024	12-Mar-2024	0 hrs	12 hrs	× UCP	12-Mar-2024	0 hrs	12 hrs	× UCP
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
WTP Discharge	E420	11-Mar-2024	12-Mar-2024	180 days	1 days	✓	12-Mar-2024	180 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	
Volatile Organic Compounds : VOCs (BC List) by Headspace GC-MS										
Glass vial (sodium bisulfate)										
WTP Discharge	E611C	11-Mar-2024	12-Mar-2024	14 days	1 days	✓	12-Mar-2024	14 days	1 days	✓

Legend & Qualifier Definitions

EHTR-FM: Exceeded ALS recommended hold time prior to sample receipt. Field Measurement recommended

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

UCP: Unsuitable Container and/or Preservative used (invalidates standard hold time). Maximum hold time of zero applied. Test results may be biased low / unreliable, and may not meet regulatory requirements.

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			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	1362043	1	3	33.3	5.0	✓
Ammonia by Fluorescence	E298	1362176	1	1	100.0	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	1362047	1	3	33.3	5.0	✓
Chloride in Water by IC	E235.Cl	1362046	1	3	33.3	5.0	✓
Conductivity in Water	E100	1362044	1	1	100.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1362342	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1362339	1	1	100.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1362172	1	3	33.3	5.0	✓
Fluoride in Water by IC	E235.F	1362045	1	3	33.3	5.0	✓
Glycols (4 analytes) by GC-FID	E680E	1362071	1	3	33.3	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1362048	1	3	33.3	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1362049	1	3	33.3	5.0	✓
pH by Meter	E108	1362042	1	3	33.3	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1366149	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	1362050	1	3	33.3	5.0	✓
TDS by Gravimetry	E162	1362324	1	3	33.3	5.0	✓
Total Mercury in Water by CVAAS	E508	1362338	1	19	5.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1362238	1	4	25.0	5.0	✓
Total Nitrogen by Colourimetry	E366	1362174	1	1	100.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1362173	1	3	33.3	5.0	✓
TSS by Gravimetry	E160	1362325	1	3	33.3	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	1364557	0	1	0.0	5.0	×
VOCs (BC List) by Headspace GC-MS	E611C	1362349	1	4	25.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	1362043	1	3	33.3	5.0	✓
Ammonia by Fluorescence	E298	1362176	1	1	100.0	5.0	✓
BC PHCs - EPH by GC-FID	E601A	1362274	1	16	6.2	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	1362047	1	3	33.3	5.0	✓
Chloride in Water by IC	E235.Cl	1362046	1	3	33.3	5.0	✓
Conductivity in Water	E100	1362044	1	1	100.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1362342	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1362339	1	1	100.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1362172	1	3	33.3	5.0	✓
Fluoride in Water by IC	E235.F	1362045	1	3	33.3	5.0	✓
Glycols (4 analytes) by GC-FID	E680E	1362071	1	3	33.3	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1362048	1	3	33.3	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Nitrite in Water by IC (Low Level)	E235.NO2-L	1362049	1	3	33.3	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	1362275	1	18	5.5	5.0	✓
pH by Meter	E108	1362042	1	3	33.3	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1366149	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	1362050	1	3	33.3	5.0	✓
TDS by Gravimetry	E162	1362324	1	3	33.3	5.0	✓
Total Mercury in Water by CVAAS	E508	1362338	1	19	5.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1362238	1	4	25.0	5.0	✓
Total Nitrogen by Colourimetry	E366	1362174	1	1	100.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1362173	1	3	33.3	5.0	✓
TSS by Gravimetry	E160	1362325	1	3	33.3	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	1364557	1	1	100.0	5.0	✓
VOCs (BC List) by Headspace GC-MS	E611C	1362349	1	4	25.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	1362043	1	3	33.3	5.0	✓
Ammonia by Fluorescence	E298	1362176	1	1	100.0	5.0	✓
BC PHCs - EPH by GC-FID	E601A	1362274	1	16	6.2	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	1362047	1	3	33.3	5.0	✓
Chloride in Water by IC	E235.Cl	1362046	1	3	33.3	5.0	✓
Conductivity in Water	E100	1362044	1	1	100.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1362342	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1362339	1	1	100.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1362172	1	3	33.3	5.0	✓
Fluoride in Water by IC	E235.F	1362045	1	3	33.3	5.0	✓
Glycols (4 analytes) by GC-FID	E680E	1362071	1	3	33.3	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1362048	1	3	33.3	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1362049	1	3	33.3	5.0	✓
PAHs by Hexane LVI GC-MS	E641A	1362275	1	18	5.5	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1366149	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	1362050	1	3	33.3	5.0	✓
TDS by Gravimetry	E162	1362324	1	3	33.3	5.0	✓
Total Mercury in Water by CVAAS	E508	1362338	1	19	5.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1362238	1	4	25.0	5.0	✓
Total Nitrogen by Colourimetry	E366	1362174	1	1	100.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1362173	1	3	33.3	5.0	✓
TSS by Gravimetry	E160	1362325	1	3	33.3	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	1364557	1	1	100.0	5.0	✓
VOCs (BC List) by Headspace GC-MS	E611C	1362349	1	4	25.0	5.0	✓
Matrix Spikes (MS)							

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Matrix Spikes (MS) - Continued							
Ammonia by Fluorescence	E298	1362176	0	1	0.0	5.0	×
Bromide in Water by IC (Low Level)	E235.Br-L	1362047	1	3	33.3	5.0	✓
Chloride in Water by IC	E235.Cl	1362046	1	3	33.3	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1362342	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1362339	0	1	0.0	5.0	×
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1362172	1	3	33.3	5.0	✓
Fluoride in Water by IC	E235.F	1362045	1	3	33.3	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1362048	1	3	33.3	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1362049	1	3	33.3	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1366149	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	1362050	1	3	33.3	5.0	✓
Total Mercury in Water by CVAAS	E508	1362338	1	19	5.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1362238	1	4	25.0	5.0	✓
Total Nitrogen by Colourimetry	E366	1362174	0	1	0.0	5.0	×
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1362173	1	3	33.3	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	1364557	0	1	0.0	5.0	×
VOCs (BC List) by Headspace GC-MS	E611C	1362349	1	4	25.0	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
Conductivity in Water	E100 ALS Environmental - Vancouver	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 ALS Environmental - Vancouver	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
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 ± 1°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 ± 2°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.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Description
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.
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 CO2. 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 CO2. 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 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 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.
Phenols (4AAP) in Water by Colorimetry	E562 ALS Environmental - Waterloo	Water	EPA 9066	This automated method is based on the distillation of phenol and subsequent reaction of the distillate with alkaline ferricyanide (K3Fe(CN)6) and 4-amino-antipyrine (4-AAP) to form a red complex which is measured colorimetrically.
VH and F1 by Headspace GC-FID	E581.VH+F1 ALS Environmental - Vancouver	Water	BC MOE Lab Manual / CCME PHC in Soil - Tier 1 (mod)	Volatile Hydrocarbons (VH and F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law. Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
BC PHCs - EPH by GC-FID	E601A ALS Environmental - Vancouver	Water	BC MOE Lab Manual	Sample extracts are analyzed by GC-FID for BC hydrocarbon fractions.
VOCs (BC List) by Headspace GC-MS	E611C ALS Environmental - Vancouver	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
PAHs by Hexane LVI GC-MS	E641A ALS Environmental - Vancouver	Water	EPA 8270E (mod)	Polycyclic Aromatic Hydrocarbons (PAHs) are analyzed by large volume injection (LVI) GC-MS.
Glycols (4 analytes) by GC-FID	E680E ALS Environmental - Vancouver	Water	EPA 8015D (mod)	Derivatized glycols are analyzed by GC-FID.
Dissolved Hardness (Calculated)	EC100 ALS Environmental - Vancouver	Water	APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 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 CaCO3), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO3 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.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Description
Un-ionized and Ionized Ammonia (Calculation) (Field Temperature and pH)	EC298A ALS Environmental - Vancouver	Water	CCME CWQG Ammonia	Un-ionized ammonia is calculated from test results for total ammonia, field temperature and pH, and is expressed in units of mg/L "as N".
VPH: VH-BTEX-Styrene	EC580A ALS Environmental - Vancouver	Water	BC MOE Lab Manual (VPH in Water and Solids) (mod)	Volatile Petroleum Hydrocarbons (VPH) is calculated as follows: VPHw = Volatile Hydrocarbons (VH6-10) minus benzene, toluene, ethylbenzene, xylenes (BTEX) and styrene.
LEPH and HEPH: EPH-PAH	EC600A ALS Environmental - Vancouver	Water	BC MOE Lab Manual (LEPH and HEPH)	Light Extractable Petroleum Hydrocarbons (LEPH) and Heavy Extractable Petroleum Hydrocarbons (HEPH) are calculated as follows: LEPH = Extractable Petroleum Hydrocarbons (EPH10-19) minus Acenaphthene, Acridine, Anthracene, Fluorene, Naphthalene and Phenanthrene; HEPH = Extractable Petroleum Hydrocarbons (EPH19-32) minus Benz(a)anthracene, Benzo(a)pyrene, Fluoranthene, and Pyrene.
Field pH,EC,Salinity,Cl2,ClO2,ORP,DO, Turbidity,T,T-P,o-PO4,NH3,Chloramine	EF001 ALS Environmental - Vancouver	Water	Field Measurement (Client Supplied)	Field pH,EC,Salinity,Cl2,ClO2,ORP,DO, Turbidity,T,T-P,o-PO4,NH3 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 Description
Preparation for Ammonia	EP298 ALS Environmental - Vancouver	Water		Sample preparation for Preserved Nutrients Water Quality Analysis.
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	EP359 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.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Description
Dissolved Mercury Water Filtration	EP509 ALS Environmental - Vancouver	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HCl.
VOCs Preparation for Headspace Analysis	EP581 ALS Environmental - Vancouver	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into the GC/MS-FID system.
PHCs and PAHs Hexane Extraction	EP601 ALS Environmental - Vancouver	Water	EPA 3511 (mod)	Petroleum Hydrocarbons (PHCs) and Polycyclic Aromatic Hydrocarbons (PAHs) are extracted using a hexane liquid-liquid extraction.
Glycols Extraction and Derivatization (BC Only)	EP680E ALS Environmental - Vancouver	Water	EPA 8015D (mod)	Aqueous sample is derivatized and extracted with orgaic solvent.

VA24A5021_COC:

Chain of Custody (COC) / Analytical Request Form

COC Number: 23 - 1084264

Page of

Canada Toll Free: 1 800 668 9878

ALS

www.alsglobal.com

Report To	Contact and company name below will appear on the final report	Reports / Recipients
Company:	Fkm	Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Contact:	Sara Derakhshi	Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A
Phone:	514 891 2993	☐ Compare Results to Criteria on Report - provide details below if box checked.
	Company address below will appear on the final report	Select Distribution: ☐ EMAIL ☐ MAIL ☐ FAX
Street:		Email 1 or Fax Sara.Derakhshi@MichelsCanada.com
City/Province:		Email 2 BradClarke@MichelsCanada.com
Postal Code:		Email 3
Invoice To	Same as Report To ☐ YES ☐ NO	Invoice Recipients
	Copy of Invoice with Report ☐ YES ☐ NO	Select Invoice Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Company:	Fkm	Email 1 or Fax JKriwokon@FrontierKemper…
Contact:	Jenessa Kriwokon	Email 2

Project Information		Oil and Gas Required Fields (client use)	
ALS Client Code / QUOTE #:	Eqp 150	AFE/Cost Center:	PO#
Job / Project #:		Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:	BC Rail	Location:	
ALS Lab Work Order # (ALS use only):		ALS Contact:	Sampler:

Turnaround Time (TAT) Requested

- ☒ Routine [R] if received by 3pm M-F - no surcharges apply
- ☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
- ☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
- ☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
- ☑ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
- ☐ Same day [E2] if received by 10am M-S - 200% rush surcharge.

Additional fees may apply to rush requests on weekends, statutory holidays and for non-routine tests.

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm am/pm

For all tests with rush TATs requested, please contact your AM to confirm availability.

AFFIX ALS BARCODE LABEL HERE (ALS use only)

Analysis Request — Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	physical test	dissolved metals (P)	Total metals	organics (P)	PAH, EPH, VPH (P)	VOC (P)	Anions and Nutrients (P)	Hydrocarbons (P)	Glycols (P)	DOC, TOC (P)	phenols (P)				SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	WTP discharge	11-03-24	12:30	water		✓	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓						

Environmental Division
Vancouver
Work Order Reference
VA24A5021
Telephone : +1 604 253 4188

Drinking Water (DW) Samples[1] (client use)	Notes / Specify Limits for result evaluation by selecting from… (Excel COC only)
Are samples taken from a Regulated DW System? ☐ YES ☐ NO	Check with guideline FAL and MAL
Are samples for human consumption/ use? ☐ YES ☐ NO	

SAMPLE RECEIPT DETAILS (ALS use only)

Cooling Method: ☑ NONE ☐ ICE ☐ ICE PACKS ☐ FROZEN ☐ COOLING INITIATED

Cooler Custody Seals Intact: ☐ YES ☐ N/A Sample Custody Seals Intact: ☐ YES ☐ N/A

INITIAL COOLER TEMPERATURES °C:

FINAL COOLER TEMPERATURES °C: 15

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by: Sara Derakhshi	Date: 11,03,2024	Time:	Received by:	Date:	Time:	Received by: CW	Date: Mar 11	Time: 1415

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION WHITE - LABORATORY COPY YELLOW - CLIENT COPY

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a Regulated Drinking Water (DW) System, please submit using an Authorized DW COC form.

WTP Discharge Field Notes and Logs

EGP Woodfibre Gas Pipeline Project
Discharged Water Report

Discharged Water Details:

Details	Values
Discharge Date	March 15, 2024
Discharge Time	Commencement Time: 12:15 PM, Completion Time: 04:53 PM
Total Duration	4 hours and 38 minutes
Pause Duration	16 minutes
Total Volume Discharged	Gallons: 34,371.9 gallons, Cubic Meters: 130.11 m^3
Discharge Rate	Approximately 132 gallons per minute (GPM)
In-Situ Parameter Checks	Prior to commencing discharge: 08:05 AM, During discharge: 13:42 PM and 16:00 PM
Weather	Temperature: Early morning - 2°C, Afternoon 20°C

Photos:

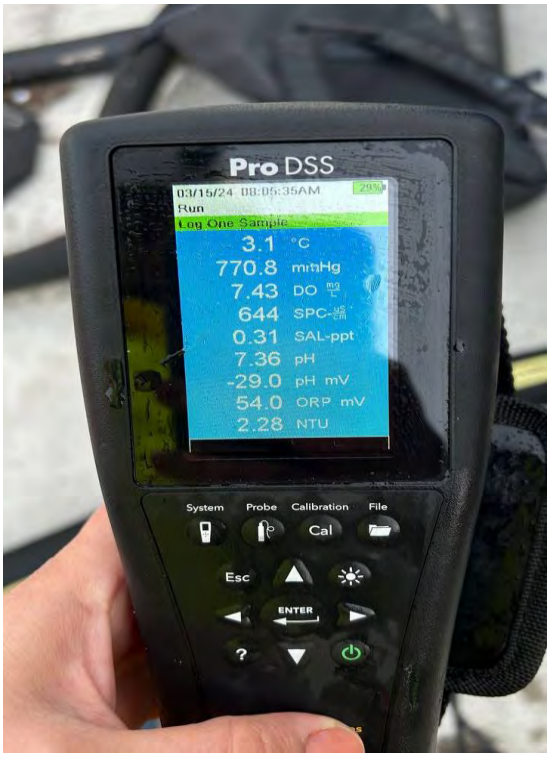

Photo 1: 08:05 AM, 03/15/24

(In-Situ before start discharging)

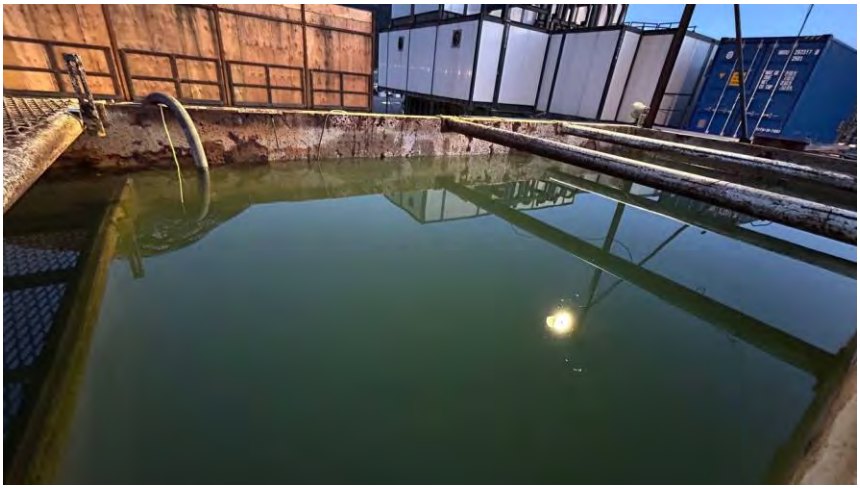

Photo 2: 07:11 AM, 03/15/24

(Top of the tanks without Visible Sheen)

Photo 3: 01:42 PM, 03/15/24

(In-Situ during discharging)

Photo 4: 04:00 PM, 03/15/24

(In-Situ during discharging)

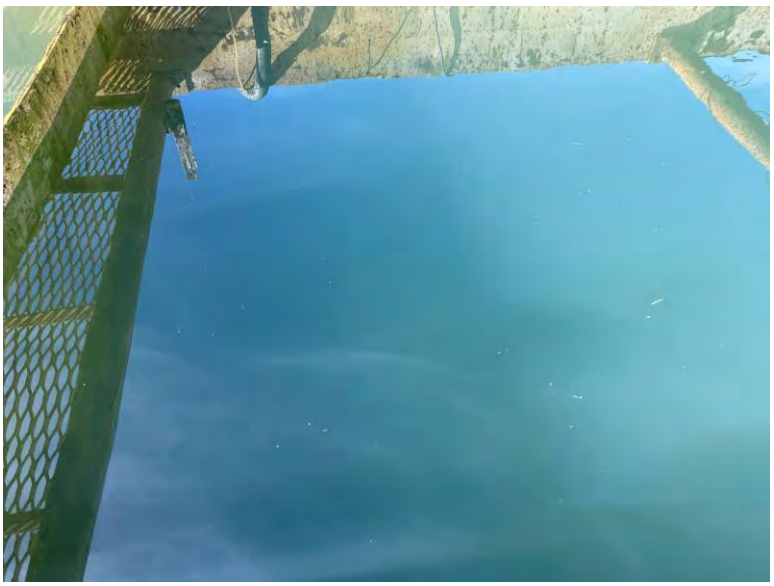

Photo 5: 04:00 PM, 03/15/24

(Top of the tanks without Visible Sheen)

Photo 6: 12:15 PM, 03/15/24

(Flow Meter at the start of discharging)

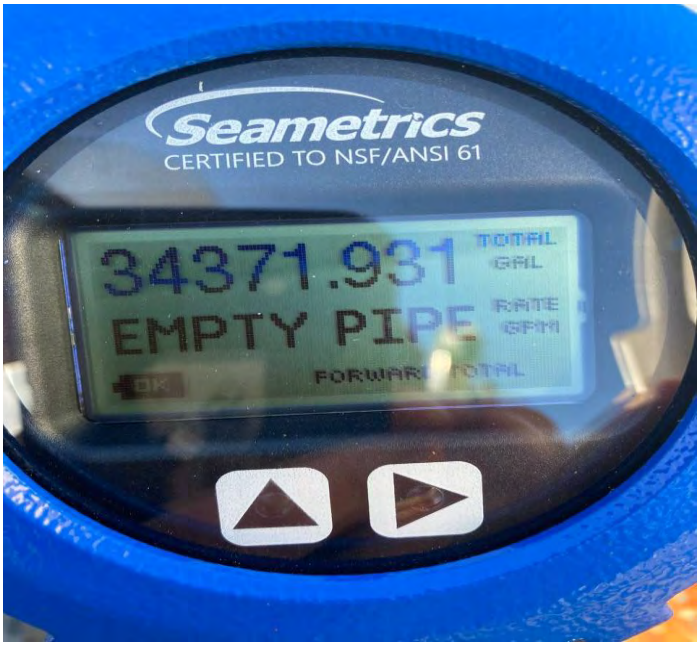

Photo 7: 04:53 PM, 03/15/24

(Flow Meter at the end of discharging)

Photo 8: 04:53 PM, 03/15/24

(Flow Meter installed on the discharging pipe)

Appendix B Receiving Environment Documentation

Receiving Environment Sample Analysis

TRITON Environmental Consultants	Sample ID	Reviewed and signed off by:			Miranda Lewis PAg, MSc	BCR US1 (Upstream)	BCR DS 1 (Downstream)	Sample or value notes	BCWQ FAL - Short Term	BCWQ FAL - Long Term	BCWQ MAL - Short Term	BCWQ MAL - Long Term
	LAB ID					VA24A5115-002	VA24A5115-001					
	Date Sampled					12-Mar-2024	12-Mar-2024					
	Time Sampled					11:21	11:40					
Analyte	Units	BCAWWQG-FAL-LT [1,2]	BCAWWQG-FAL-ST [1,2]	BCAWWQG-MAL-ST [1]	BCAWWQG-MAL-LT [1,2]	Water	Water					
						N/A	N/A		Guideline notes			
In Situ Parameters												
pH (field)	pH units	6.5-9.0	6.5-9.0	7.0-8.7	7.0-8.7	7.05	7.09		If natural pH < 6.5, no statistically significant decrease from background. No restriction in increase except in areas with unique flora or fauna. Unrestricted change permitted within range of 6.5 to 9.0. If natural pH > 9.0, no statistically significant increase from background. Refer to BC Water Quality Guidelines for more information.		Unrestricted change within this range (for protection of mollusc embryo development).	
Temperature (field)	°C	-	19, hourly rate of change <1°C	Max +/- from BKG 1°C, hourly rate of change <0.5°C	-	6.3	5.6		Guideline is species-dependent. Short-term daily temperature guideline is 19°C for streams with unknown fish distribution. Refer to BC Water Quality Guidelines for more information on incubation and spawning temperature guidelines, and for those with different fish distributions. Hourly rate of change not to exceed 1°C.		Guideline for marine waters are based on natural ambient conditions. Max and min. 1°C change from natural condition. Natural temperature cycle characteristic of the site should not be altered in amplitude or frequency by human activities. Max rate of any human-induced temperature change not to exceed 0.5°C hourly.	
Conductivity (field)	µS/cm	-	-	-	-	60	51					
Turbidity (field)	NTU	Varies with background, see note Lowest value for guideline is 3 NTU	Varies with background, see note Lowest value for guideline is 9 NTU	Varies with background, see note Lowest value for guideline is 9 NTU	Varies with background, see note Lowest value for guideline is 3 NTU	7.84	6.63		Change from background of 8 NTU at any one time for a duration of 24 h in all waters during clear flows or in clear waters. Change from background of 5 NTU at any time when background is 8 - 50 NTU during high flows or in turbid waters. Change from background of 10% when background is > 50 NTU at any time during high flows or in turbid waters.	Change from background of 2 NTU at any one time for 30 days in clear flows.	Change from background of 8 NTU at any one time for a duration of 24 h in all waters during clear flows or in clear waters. Change from background of 5 NTU at any time when background is 8 - 50 NTU during high flows or in turbid waters. Change from background of 10% when background is > 50 NTU at any time during high flows or in turbid waters.	Change from background of 2 NTU at any one time for 30 days in clear flows.
Dissolved Oxygen (field)	mg/L	Varies with life stage, see note	Varies with life stage, see note	Varies with life stage, see note	Varies with life stage, see note	12.93	11.86		Buried embryo/alevin minimum 9 mg/L, all other life stages 5 mg/L. Refer to BC Water Quality Guidelines for more information.	Buried embryo/alevin minimum 11 mg/L, all other life stages 8 mg/L. Refer to BC Water Quality Guidelines for more information.	Buried embryo/alevin minimum 9 mg/L, all other life stages 5 mg/L. Refer to BC Water Quality Guidelines for more information.	Buried embryo/alevin minimum 11 mg/L, all other life stages 8 mg/L. Refer to BC Water Quality Guidelines for more information.
General Parameters												
Hardness (as CaCO3) (total)	mg/L	-	-	-	-	17.7	17.6					
Total Dissolved Solids	mg/L	-	-	-	-	47	49					
Total Suspended Solids	mg/L	Varies with background, see note Lowest value for guideline is 6mg/L	Varies with background, see note Lowest value for guideline is 26mg/L	Varies with background, see note Lowest value for guideline is 26mg/L	Varies with background, see note Lowest value for guideline is 6mg/L	< 3.0	4.3		Change from background of 25 mg/L at any one time for duration of 24 h in all waters during clear flows or in clear waters. Change from background of 10 mg/L at any one time when background 25-100 mg/L during high flows or turbid waters. Change from background of 10% when background is > 100 mg/L at any time during high flows or turbid waters.	Change from background of 5 mg/L @ one time for a druation of 30 days in clear flow.	Change from background of 25 mg/L at any one time for duration of 24 h in all waters during clear flows or in clear waters. Change from background of 10 mg/L at any one time when background 25-100 mg/L during high flows or turbid waters. Change from background of 10% when background is > 100 mg/L at any time during high flows or turbid waters.	Change from background of 5 mg/L @ one time for a druation of 30 days in clear flow.
Total Organic Carbon (TOC)	mg/L	-	-	-	-	1.93	1.92			Long-term (30-day) median within 20% of background median		
Dissolved Organic Carbon (DOC)	mg/L	-	-	-	-	1.96	1.92			Long-term (30-day) median within 20% of background median [3]		
Total Alkalinity ($CaCO_3$)	mg/L	Categorical	-	-	-	15.9	15.5	The upstream and downstream locations have moderate sensitivity to acid inputs (i.e. moderate buffering capcity).		Guideline is for alkalinity (as CaCO3) and categorizes the sensitivity of a water body to acid inputs. Alkalinity < 10 mg/L is considered highly sensitive to acid inputs; 10 - 20 mg/L is considered moderately sensitive to acid inputs; > 20 mg/L is considered low sensitivity.		
Total Sulfide (as S)	mg/L	-	-	-	-	< 0.0015	< 0.0015					
Total Sulfide (un-ionized as H2S)	mg/L	0.002	-	-	-	< 0.0015	< 0.0015	LT guideline not applicable [3]		Working guideline		
Total Sulfide (as H2S)	mg/L	-	-	-	-	< 0.0016	< 0.0016					
Anions and Nutrients												
Ammonia	mg/L ammonia-N	pH and temperature dependent	pH and temperature dependent	pH, temperature, and salinity dependent	pH, temperature, and salinity dependent	0.208	0.116		Guideline for ammonia as N. pH and temperature dependent. Refer to BC Water Quality Guidelines for more information.	Guideline for ammonia as N. pH and temperature dependent. Refer to BC Water Quality Guidelines for more information.	Guideline for ammonia as N. pH, salinity, and temperature dependent. Refer to BC Water Quality Guidelines for more information. Guideline not applicable to freshwater EOP samples.	Guideline for ammonia as N. pH, salinity, and temperature dependent. Refer to BC Water Quality Guidelines for more information. Guideline not applicable to freshwater EOP samples.
Bromide	mg/L	-	-	-	-	< 0.050	< 0.050					
Chloride	mg/L	150	600	> 110% of background	< 90% of background	3.37	2.88				Human activities should not cause the chloride of marine and estuarine waters to fluctuate by more than 10% of the natural chloride expected at that time and depth.	Human activities should not cause the chloride of marine and estuarine waters to fluctuate by more than 10% of the natural chloride expected at that time and depth.
Fluoride	mg/L	-	Varies with hardness	1.5	-	< 0.020	0.021		Guideline has interim status.			
Nitrate (as N)	mg/L	3	32.8	-	3.7	0.0548	0.0541					
Nitrite (as N)	mg/L	Varies with chloride	0.06	-	-	0.0012	0.0018					
Total Nitrogen	mg/L	-	-	-	-	0.335	0.24					
Total Phosphorous	mg/L	0.005 to 0.015	-	-	-	0.0161	0.0134			Guideline is for lakes, refer to BCWQ guideline for nutrients and algae for more information. Guideline does not apply to site.		
Sulfate (as SO4)	mg/L	Varies with hardness	-	-	-	4.83	5.01					
Total Metals												
Aluminum (Al)-Total	mg/L	Varies with pH, DOC, hardness	-	-	-	***0.201***	***0.19***	**Upstream and downstream locations exceed BCWQ long-term guideline.** LT guideline not applicable at this time (no continous discharge) [3]	Guideline varies with pH, hardness and Dissolved Organic Carbon (DOC). Refer to BC Water Quality Guidelines for more information.	Guideline varies with pH, hardness and Dissolved Organic Carbon (DOC). Refer to BC Water Quality Guidelines for more information.		
Antimony (Sb)-Total	mg/L	0.074	0.25	-	-	< 0.00010	< 0.00010					
Arsenic (As)-Total	mg/L	0.005	-	-	0.0125	0.00016	0.00015					Interim guideline status
Barium (Ba)-Total	mg/L	1	-	-	-	0.00792	0.0084			Working guideline status		
Beryllium (Be)-Total	mg/L	0.00013	-	-	0.100	< 0.000100	< 0.000100			Working guideline status		Working guideline status
Bismuth (Bi)-Total	mg/L	-	-	-	-	< 0.000050	< 0.000050					
Boron (B)-Total	mg/L	1.2	-	-	1.2	< 0.010	0.01					
Cadmium (Cd)-Total	mg/L	-	-	-	0.000012	0.0000104	0.0000073					Working guideline status
Calcium (Ca)-Total	mg/L	-	-	-	-	5.89	5.89					
Cesium (Cs)-Total	mg/L	-	-	-	-	0.000021	0.00002					
Chromium (Cr) - Total	mg/L	-	-	-	-	< 0.00050	< 0.00050					
Chromium (Cr(III))-Total	mg/L	0.0089	-	-	0.056	< 0.00050	< 0.00050			Working guideline status		Working guideline status
Chromium (Cr(VI))-Total	mg/L	0.001	-	-	0.0015	0.00089	< 0.00050			Working guideline status		Working guideline status
Cobalt (Co)-Total	mg/L	0.004	0.11	-	-	< 0.00010	0.0001					
Copper (Cu)-Total	mg/L	-	-	0.003	0.002	0.00115	0.00106					
Iron (Fe)-Total	mg/L	-	1	-	-	0.245	0.188					
Lead (Pb)-Total	mg/L	Varies with hardness	Varies with hardness	0.14	0.002	0.000072	0.000058		Guideline varies with hardness, refer to BC Water Quality Guidelines for more information. Guideline is 0.003 where hardness ≤8mg/L. Guideline uses equation $e^{(1.273*ln(hardness)-1.460)}$ where hardness is 8-360 mg/L. Lowest value for guideline is 0.003 mg/L.	Guideline varies with hardness, refer to BC Water Quality Guidelines for more information. Guideline equation $e^{(1.273*ln(hardness)-4.705)}$ applies to samples with hardness 8-360 mg/L.		
Lithium (Li)-Total	mg/L	-	-	-	-	< 0.0010	< 0.0010					
Magnesium (Mg)-Total	mg/L	-	-	-	-	0.728	0.705					
Manganese (Mn)-Total	mg/L	Varies with hardness	Varies with hardness	-	-	0.00867	0.00852		Guideline varies with hardness, refer to BC Water Quality Guidelines for more information. Guideline uses equation 0.011102*hardness+0.54 and applies to samples with hardness 25-259 mg/L. Lowest value for guideline is 0.77 mg/L	Guideline varies with hardness, refer to BC Water Quality Guidelines for more information. Guideline uses equation 0.0044*hardness+0.605 and applies to samples with hardness 37-450 mg/L. Lowest value for guideline is 0.81 mg/L		
Mercury (Hg)-Total	mg/L	Varies with methyl mercury	-	-	-	< 0.0000050	< 0.0000050			Guideline is calculated as follows: 0.1(Methylmercury). When MeHg ≤ 0.5% of total Hg, guideline is equal to 0.02 mg/L.		
Molybdenum (Mo)-Total	mg/L	7.6	46	-	-	0.000929	0.000624					
Nickel (Ni)-Total	mg/L	Varies with hardness	-	-	0.0083	< 0.00050	< 0.00050			Working guideline status. Guideline varies with hardness. Guideline is 0.025 mg/L at water hardness ≤60mg/L, at hardness 60-180 use equation $e^{(0.76*ln(hardness)-0.06)}$, guideline at hardness ≥180 mg/L is 0.15 mg/L. Refer to BC Water Quality Guidelines for more information.		Working guideline status
Phosphorus (P)-Total	mg/L	0.005 to 0.015	-	-	-	< 0.050	< 0.050			Guideline only applies to lakes with salmonid species being the dominant fish species. Guideline is for reference only and does not apply to site.		
Potassium (K)-Total	mg/L	-	-	-	-	0.554	0.542					
Rubidium (Rb)-Total	mg/L	-	-	-	-	0.00089	0.00084					
Selenium (Se)-Total	mg/L	0.002	-	-	0.002	< 0.000050	< 0.000050			Guideline for freshwater aquatic life (water column). Alert concentration is 0.001 mg/L, with separate guidelines for sediment, invertebrate and fish tissue. Refer to BC Water Quality Guidelines for more information on guidelines and sampling guidance.		Guideline for marine aquatic life (water column). Alert concentration is 0.001 mg/L, with separate guidelines for sediment, invertebrate and fish tissue. Refer to BC Water Quality Guidelines for more information on guidelines and sampling guidance.
Silicon (Si)-Total	mg/L	-	-	-	-	5.08	4.81					
Silver (Ag)-Total	mg/L	Varies with hardness	Varies with hardness	0.003	0.0015	< 0.000010	< 0.000010		Varies with hardness. Guideline is 0.0001 mg/L at hardness ≤100 mg/L, and 0.003 at Hardness > 300 mg/L	Varies with hardness. Guideline is 0.00005 mg/L at hardness ≤100 mg/L, and 0.0015 at Hardness > 100 mg/L		Guideline applies to open coast and estuaries. Guideline is applicable to the EGP site.
Sodium (Na)-Total	mg/L	-	-	-	-	3.3	2.97					
Strontium (Sr)-Total	mg/L	-	-	-	-	0.0395	0.0373					
Sulfur (S)-Total	mg/L	-	-	-	-	1.44	1.4					
Tellurium (Te)-Total	mg/L	-	-	-	-	< 0.00020	< 0.00020					
Thallium (Tl)-Total	mg/L	0.0008	-	-	-	< 0.000010	< 0.000010			30-day average, site-specific objective for the lower Columbia River, BC. Guideline is for reference only and does not apply to the EGP site.		
Thorium (Th)-Total	mg/L	-	-	-	-	< 0.00010	< 0.00010					
Tin (Sn)-Total	mg/L	-	-	-	-	< 0.00010	< 0.00010					
Titanium (Ti)-Total	mg/L	-	-	-	-	0.00569	0.0053					
Tungsten (W)-Total	mg/L	-	-	-	-	< 0.00010	< 0.00010					
Uranium (U)-Total	mg/L	0.0085	-	-	-	0.000334	0.000335			Working guideline status		
Vanadium (V)-Total	mg/L	-	-	-	0.050	0.00161	0.00153					Working guideline status
Zinc (Zn)-Total	mg/L	-	-	0.016	0.010	0.0037	< 0.0030					
Zirconium (Zr)-Total	mg/L	-	-	-	-	< 0.00020	< 0.00020					
Dissolved Metals												
Aluminum (Al)-Dissolved	mg/L	-	-	-	-	0.0499	0.0476					
Antimony (Sb)-Dissolved	mg/L	-	-	-	-	< 0.00010	< 0.00010					
Arsenic (As)-Dissolved	mg/L	-	-	-	-	0.00011	0.00011					
Barium (Ba)-Dissolved	mg/L	-	-	-	-	0.00955	0.00968					
Beryllium (Be)-Dissolved	mg/L	-	-	-	-	< 0.000100	< 0.000100					
Bismuth (Bi)-Dissolved	mg/L	-	-	-	-	< 0.000050	< 0.000050					
Boron (B)-Dissolved	mg/L	-	-	-	-	< 0.010	< 0.010					
Cadmium (Cd)-Dissolved	mg/L	Varies with hardness	Varies with hardness	-	-	0.0000084	0.0000074		Guideline is hardness dependent, refer to BC Water Quality Guidelines for more information. Guideline is applicable to water hardness between 7.0 and 455 mg/L. Guideline uses equation $e^{(0.86*ln(hardness)-3.2)}$. Lowest value for guideline is 0.000018 mg/L	Guideline is hardness dependent, refer to BC Water Quality Guidelines for more information. Guideline is applicable to hardness between 3.4 and 285 mg/L. Guideline uses equation $e^{(0.736*ln(hardness)-5.943)}$. Lowest value for guideline is 0.00004		
Calcium (Ca)-Dissolved	mg/L	Categorical	-	-	-	5.92	5.68	Both locations have moderate sensitivity to acid inputs (i.e. medium buffering capacity).		Guideline categorizes the sensitivity of a water body to acid inputs (i.e. buffering capacity). Standard is 4 mg/L dissolved Ca for the most sensitive waterbodies.5 - 8 mg/L for waterbodies with moderate sensitivity to acid inputs. Waterbodies with dissolved calcium > 8mg/L are considered to have low sensitivity to acid inputs.		
Cesium (Cs)-Dissolved	mg/L	-	-	-	-	0.000016	0.000015					
Chromium (Cr)-Dissolved	mg/L	-	-	-	-	< 0.00050	< 0.00050					
Cobalt (Co)-Dissolved	mg/L	-	-	-	-	< 0.00010	< 0.00010					
Copper (Cu)-Dissolved	mg/L	Varies with pH, DOC, hardness	Varies with pH, DOC, hardness	-	-	***0.00074***	***0.00079***	**Upstream and downstream locations exceed the long term BCWQ for FAL.** LT guideline not applicable [3]	Guideline varies with pH, hardness and Dissolved Organic Carbon (DOC). Refer to BC Water Quality Guidelines for more information. Guideline uses lookup table incorporating sample pH, hardness and DOC.	Guideline varies with pH, hardness and Dissolved Organic Carbon (DOC). Refer to BC Water Quality Guidelines for more information. Guideline uses lookup table incorporating sample pH, hardness and DOC.		
Iron (Fe)-Dissolved	mg/L	-	0.35	-	-	0.076	0.068					
Lead (Pb)-Dissolved	mg/L	-	-	-	-	< 0.000050	< 0.000050					
Lithium (Li)-Dissolved	mg/L	-	-	-	-	< 0.0010	< 0.0010					
Magnesium (Mg)-Dissolved	mg/L	-	-	-	-	0.67	0.644					
Manganese (Mn)-Dissolved	mg/L	-	-	-	-	0.00548	0.00584					
Mercury (Hg)-Dissolved	mg/L	-	-	-	-	< 0.0000050	< 0.0000050					
Molybdenum (Mo)-Dissolved	mg/L	-	-	-	-	0.000559	0.000554					
Nickel (Ni)-Dissolved	mg/L	-	-	-	-	< 0.00050	< 0.00050					
Phosphorus (P)-Dissolved	mg/L	-	-	-	-	< 0.050	< 0.050					
Potassium (K)-Dissolved	mg/L	-	-	-	-	0.581	0.565					
Rubidium (Rb)-Dissolved	mg/L	-	-	-	-	0.00086	0.00082					
Selenium (Se)-Dissolved	mg/L	-	-	-	-	< 0.000050	< 0.000050					
Silicon (Si)-Dissolved	mg/L	-	-	-	-	4.91	4.85					
Silver (Ag)-Dissolved	mg/L	-	-	-	-	< 0.000010	< 0.000010					
Sodium (Na)-Dissolved	mg/L	-	-	-	-	2.82	2.66					
Strontium (Sr)-Dissolved	mg/L	-	-	-	-	0.0366	0.0368					
Sulfur (S)-Dissolved	mg/L	-	-	-	-	1.4	1.49					
Tellurium (Te)-Dissolved	mg/L	-	-	-	-	< 0.00020	< 0.00020					
Thallium (Tl)-Dissolved	mg/L	-	-	-	-	< 0.000010	< 0.000010					
Thorium (Th)-Dissolved	mg/L	-	-	-	-	< 0.00010	< 0.00010					
Tin (Sn)-Dissolved	mg/L	-	-	-	-	< 0.00010	< 0.00010					
Titanium (Ti)-Dissolved	mg/L	-	-	-	-	0.00047	0.00045					
Tungsten (W)-Dissolved	mg/L	-	-	-	-	< 0.00010	< 0.00010					
Uranium (U)-Dissolved	mg/L	-	-	-	-	0.000325	0.000326					
Vanadium (V)-Dissolved	mg/L	-	-	-	-	0.00115	0.00103					
Zinc (Zn)-Dissolved	mg/L	Varies with pH, DOC, hardness	Varies with DOC and hardness	-	-	0.0022	0.0015		Guideline varies with pH, hardness and Dissolved Organic Carbon (DOC). Refer to BC Water Quality Guidelines for more information.	Guideline varies with pH, hardness and Dissolved Organic Carbon (DOC). Refer to BC Water Quality Guidelines for more information.		
Zirconium (Zr)-Dissolved	mg/L	-	-	-	-	< 0.00020	< 0.00020					
Applied Guideline:		**British Columbia Approved and Working Water Quality Guidelines (NOV 2023) - BCAWWQG - Freshwater Aquatic Life** **British Columbia Approved and Working Water Quality Guidelines (NOV 2023) - BCAWWQG - Marine Aquatic Life**										
Color Key:	**Exceeds BCAWWQG Short and Long Term Guideline**	***Exceeds BCAWWQG Long term Guideline***	**Exceeds BCAWWQG Short term Guideline**	Exceeds BCAWWQG MAL Short term Guideline	***Exceeds BCAWWQG MAL Long term Guideline***							
Color Key:				Exceeds BCAWWQG MAL Short and Long-term Guidelines	Exceeds both BCAWWQG FAL and MAL Guidelines							

[1] BC MOECCS. 2023. BC Water Quality Guidelines for the Protection of Aquatic Life, Wildlife & Agriculture. Accessed from: wqg_summary_aquaticlife_wildlife_agri.pdf (gov.bc.ca)

[2] BC MOECCS. 2021. BC Working Water Quality Guidelines for the Protection of Aquatic Life, Wildlife & Agriculture. Accessed from: bc_env_working_water_quality_guidelines.pdf (gov.bc.ca)

[3] Note that long-term guidelines apply to averaged data to account for chronic impacts to aquatic life. Ideally, five samples collected at evenly spaced intervals over 30 days is considered to be the minimum number needed to calculate the long-term average of any parameter, though this may vary by parameter and site conditions. Long-term guidelines applied here are for reference only and may not indicate chronic impacts to aquatic life if exceedances occur in the short term.

Receiving Environment Lab Documentation

ALS Canada Ltd.

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CERTIFICATE OF ANALYSIS

Work Order	: **VA24A5115**	Page	: 1 of 6
Client	: **Triton Environmental Consultants Ltd.**	Laboratory	: ALS Environmental - Vancouver
Contact		Account Manager	
Address		Address	
Telephone		Telephone	
Project	: 11964	Date Samples Received	: 12-Mar-2024 13:35
PO	: 11964-Task20-Phase 3C-4C	Date Analysis Commenced	: 13-Mar-2024
C-O-C number	: ----	Issue Date	: 20-Mar-2024 10:09
Sampler	: ----		
Site	: ----		
Quote number	: VA23-TRIT100-003		
No. of samples received	: 2		
No. of samples analysed	: 2		

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.

Signatories	*Position*	*Laboratory Department*
Brieanna Allen	Production/Validation Manager	Administration, Burnaby, British Columbia
Erin Sanchez		Metals, Burnaby, British Columbia
Ilnaz Badbezanchi	Supervisor - Metals Prep & Mercury	Metals, Burnaby, British Columbia
Kate Dimitrova	Supervisor - Inorganic	Inorganics, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Inorganics, Burnaby, British Columbia
Lindsay Gung	Supervisor - Water Chemistry	Inorganics, Burnaby, British Columbia
Nik Perkio	Inorganics Analyst	Inorganics, Waterloo, Ontario
Nik Perkio	Inorganics Analyst	Metals, Waterloo, Ontario
Owen Cheng		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).

Unit	*Description*
-	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**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	SQU DS 1	SQU US 1	----	----	----
					Client sampling date / time	12-Mar-2024 11:40	12-Mar-2024 11:21	----	----	----
						VA24A5115-001	VA24A5115-002	--------	--------	--------
						Result	Result	----	----	----
Field Tests										
Conductivity, field	----	EF001/VA	0.10	µS/cm		51.000	60.000	----	----	----
pH, field	----	EF001/VA	0.10	pH units		7.09	7.05	----	----	----
Temperature, field	----	EF001/VA	0.10	°C		5.60	6.30	----	----	----
Physical Tests										
Hardness (as CaCO3), dissolved	----	EC100/VA	0.60	mg/L		16.8	17.5	----	----	----
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/VA	0.60	mg/L		17.6	17.7	----	----	----
Solids, total dissolved [TDS]	----	E162/VA	10	mg/L		49	47	----	----	----
Solids, total suspended [TSS]	----	E160/VA	3.0	mg/L		4.3	<3.0	----	----	----
Alkalinity, total (as CaCO3)	----	E290/VA	2.0	mg/L		15.5	15.9	----	----	----
Anions and Nutrients										
Ammonia, total (as N)	7664-41-7	E298/VA	0.0050	mg/L		0.116	0.208	----	----	----
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		2.88	3.37	----	----	----
Fluoride	16984-48-8	E235.F/VA	0.020	mg/L		0.021	<0.020	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	0.0050	mg/L		0.0541	0.0548	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	0.0010	mg/L		0.0018	0.0012	----	----	----
Nitrogen, total	7727-37-9	E366/VA	0.030	mg/L		0.240	0.335	----	----	----
Phosphorus, total	7723-14-0	E372-U/VA	0.0020	mg/L		0.0134	0.0161	----	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/VA	0.30	mg/L		5.01	4.83	----	----	----
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/VA	0.50	mg/L		1.92	1.96	----	----	----
Carbon, total organic [TOC]	----	E355-L/VA	0.50	mg/L		1.92	1.93	----	----	----
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		0.190	0.201	----	----	----

Analytical Results

Sub-Matrix: **Water**
(Matrix: **Water**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	SQU DS 1	SQU US 1	----	----	----
					Client sampling date / time	12-Mar-2024 11:40	12-Mar-2024 11:21	----	----	----
						VA24A5115-001	VA24A5115-002	--------	--------	--------
						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		0.00015	0.00016	----	----	----
Barium, total	7440-39-3	E420/VA	0.00010	mg/L		0.00840	0.00792	----	----	----
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		0.0000073	0.0000104	----	----	----
Calcium, total	7440-70-2	E420/VA	0.050	mg/L		5.89	5.89	----	----	----
Cesium, total	7440-46-2	E420/VA	0.000010	mg/L		0.000020	0.000021	----	----	----
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		0.00010	<0.00010	----	----	----
Copper, total	7440-50-8	E420/VA	0.00050	mg/L		0.00106	0.00115	----	----	----
Iron, total	7439-89-6	E420/VA	0.010	mg/L		0.188	0.245	----	----	----
Lead, total	7439-92-1	E420/VA	0.000050	mg/L		0.000058	0.000072	----	----	----
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		0.705	0.728	----	----	----
Manganese, total	7439-96-5	E420/VA	0.00010	mg/L		0.00852	0.00867	----	----	----
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		0.000624	0.000629	----	----	----
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	<0.050	----	----	----
Potassium, total	7440-09-7	E420/VA	0.050	mg/L		0.542	0.554	----	----	----
Rubidium, total	7440-17-7	E420/VA	0.00020	mg/L		0.00084	0.00089	----	----	----
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		4.81	5.08	----	----	----
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		2.97	3.30	----	----	----
Strontium, total	7440-24-6	E420/VA	0.00020	mg/L		0.0373	0.0395	----	----	----
Sulfur, total	7704-34-9	E420/VA	0.50	mg/L		1.40	1.44	----	----	----
Tellurium, total	13494-80-9	E420/VA	0.00020	mg/L		<0.00020	<0.00020	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	SQU DS 1	SQU US 1	----	----	----
					Client sampling date / time	12-Mar-2024 11:40	12-Mar-2024 11:21	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		VA24A5115-001	VA24A5115-002	--------	--------	--------
						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		0.00530	0.00559	----	----	----
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		0.000035	0.000034	----	----	----
Vanadium, total	7440-62-2	E420/VA	0.00050	mg/L		0.00153	0.00161	----	----	----
Zinc, total	7440-66-6	E420/VA	0.0030	mg/L		<0.0030	0.0057	----	----	----
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		0.0476	0.0499	----	----	----
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		0.00011	0.00011	----	----	----
Barium, dissolved	7440-39-3	E421/VA	0.00010	mg/L		0.00668	0.00655	----	----	----
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	0.0000084	----	----	----
Calcium, dissolved	7440-70-2	E421/VA	0.050	mg/L		5.68	5.92	----	----	----
Cesium, dissolved	7440-46-2	E421/VA	0.000010	mg/L		0.000015	0.000016	----	----	----
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		0.00079	0.00074	----	----	----
Iron, dissolved	7439-89-6	E421/VA	0.010	mg/L		0.068	0.078	----	----	----
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		0.644	0.670	----	----	----
Manganese, dissolved	7439-96-5	E421/VA	0.00010	mg/L		0.00584	0.00546	----	----	----
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		0.000554	0.000559	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	SQU DS 1	SQU US 1	----	----	----
					Client sampling date / time	12-Mar-2024 11:40	12-Mar-2024 11:21	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		VA24A5115-001	VA24A5115-002	--------	--------	--------
						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		0.565	0.581	----	----	----
Rubidium, dissolved	7440-17-7	E421/VA	0.00020	mg/L		0.00082	0.00086	----	----	----
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		4.85	4.91	----	----	----
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		2.66	2.82	----	----	----
Strontium, dissolved	7440-24-6	E421/VA	0.00020	mg/L		0.0368	0.0366	----	----	----
Sulfur, dissolved	7704-34-9	E421/VA	0.50	mg/L		1.49	1.40	----	----	----
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		0.00045	0.00047	----	----	----
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		0.000026	0.000025	----	----	----
Vanadium, dissolved	7440-62-2	E421/VA	0.00050	mg/L		0.00103	0.00115	----	----	----
Zinc, dissolved	7440-66-6	E421/VA	0.0010	mg/L		0.0015	0.0022	----	----	----
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], total	18540-29-9	E532/WT	0.00050	mg/L		<0.00050	0.00089	----	----	----
Chromium, trivalent [Cr III], total	16065-83-1	EC535/WT	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.

ALS Canada Ltd.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA24A5115**	Page	: 1 of 14
Client	: **Triton Environmental Consultants Ltd.**	Laboratory	: ALS Environmental - Vancouver
Contact		Account Manager	
Address		Address	
Telephone		Telephone	
Project	: 11964	Date Samples Received	: 12-Mar-2024 13:35
PO	: 11964-Task20-Phase 3C-4C	Issue Date	: 20-Mar-2024 10:09
C-O-C number	: ----		
Sampler	: ----		
Site	: ----		
Quote number	: VA23-TRIT100-003		
No. of samples received	: 2		
No. of samples analysed	: 2		

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 Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- 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)

- Analysis Holding Time Outliers exist - please see following pages for full details.

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

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 Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) SQU DS 1	E298	12-Mar-2024	13-Mar-2024	28 days	1 days	✓	19-Mar-2024	28 days	7 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) SQU US 1	E298	12-Mar-2024	13-Mar-2024	28 days	1 days	✓	19-Mar-2024	28 days	7 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE SQU DS 1	E235.Br-L	12-Mar-2024	14-Mar-2024	28 days	2 days	✓	14-Mar-2024	28 days	2 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE SQU US 1	E235.Br-L	12-Mar-2024	14-Mar-2024	28 days	2 days	✓	14-Mar-2024	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SQU DS 1	E235.Cl	12-Mar-2024	14-Mar-2024	28 days	2 days	✓	14-Mar-2024	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE SQU US 1	E235.Cl	12-Mar-2024	14-Mar-2024	28 days	2 days	✓	14-Mar-2024	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE SQU DS 1	E235.F	12-Mar-2024	14-Mar-2024	28 days	2 days	✓	14-Mar-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 Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Fluoride in Water by IC										
HDPE SQU US 1	E235.F	12-Mar-2024	14-Mar-2024	28 days	2 days	✓	14-Mar-2024	28 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE SQU US 1	E235.NO3-L	12-Mar-2024	14-Mar-2024	3 days	2 days	✓	14-Mar-2024	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE SQU DS 1	E235.NO3-L	12-Mar-2024	14-Mar-2024	3 days	2 days	✓	18-Mar-2024	3 days	6 days	× EHT
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE SQU US 1	E235.NO2-L	12-Mar-2024	14-Mar-2024	3 days	2 days	✓	14-Mar-2024	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE SQU DS 1	E235.NO2-L	12-Mar-2024	14-Mar-2024	3 days	2 days	✓	18-Mar-2024	3 days	6 days	× EHT
Anions and Nutrients : Sulfate in Water by IC										
HDPE SQU DS 1	E235.SO4	12-Mar-2024	14-Mar-2024	28 days	2 days	✓	14-Mar-2024	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE SQU US 1	E235.SO4	12-Mar-2024	14-Mar-2024	28 days	2 days	✓	14-Mar-2024	28 days	2 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) SQU DS 1	E366	12-Mar-2024	13-Mar-2024	28 days	1 days	✓	13-Mar-2024	28 days	1 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid) SQU US 1	E366	12-Mar-2024	13-Mar-2024	28 days	1 days	✓	13-Mar-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 Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
SQU DS 1	E372-U	12-Mar-2024	13-Mar-2024	28 days	1 days	✓	14-Mar-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	12-Mar-2024	13-Mar-2024	28 days	1 days	✓	14-Mar-2024	28 days	2 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial - dissolved (lab preserved)										
SQU DS 1	E509	12-Mar-2024	14-Mar-2024	28 days	2 days	✓	14-Mar-2024	28 days	2 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial - dissolved (lab preserved)										
SQU US 1	E509	12-Mar-2024	14-Mar-2024	28 days	2 days	✓	14-Mar-2024	28 days	2 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved)										
SQU DS 1	E421	12-Mar-2024	13-Mar-2024	180 days	1 days	✓	15-Mar-2024	180 days	3 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved)										
SQU US 1	E421	12-Mar-2024	13-Mar-2024	180 days	1 days	✓	15-Mar-2024	180 days	3 days	✓
Field Tests : Field pH,EC,Salinity,Cl2,ClO2,ORP,DO, Turbidity,T,T-P,o-PO4,NH3,Chloramine										
Glass vial - total (lab preserved)										
SQU DS 1	EF001	12-Mar-2024	----	----	----		13-Mar-2024	----	1 days	
Field Tests : Field pH,EC,Salinity,Cl2,ClO2,ORP,DO, Turbidity,T,T-P,o-PO4,NH3,Chloramine										
Glass vial - total (lab preserved)										
SQU US 1	EF001	12-Mar-2024	----	----	----		13-Mar-2024	----	1 days	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
SQU DS 1	E358-L	12-Mar-2024	13-Mar-2024	28 days	1 days	✓	13-Mar-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 Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
SQU US 1	E358-L	12-Mar-2024	13-Mar-2024	28 days	1 days	✓	13-Mar-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	12-Mar-2024	13-Mar-2024	28 days	1 days	✓	13-Mar-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	12-Mar-2024	13-Mar-2024	28 days	1 days	✓	13-Mar-2024	28 days	1 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
SQU DS 1	E290	12-Mar-2024	14-Mar-2024	14 days	2 days	✓	15-Mar-2024	14 days	3 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
SQU US 1	E290	12-Mar-2024	14-Mar-2024	14 days	2 days	✓	15-Mar-2024	14 days	3 days	✓
Physical Tests : TDS by Gravimetry										
HDPE										
SQU DS 1	E162	12-Mar-2024	----	----	----		18-Mar-2024	7 days	6 days	✓
Physical Tests : TDS by Gravimetry										
HDPE										
SQU US 1	E162	12-Mar-2024	----	----	----		18-Mar-2024	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE										
SQU DS 1	E160	12-Mar-2024	----	----	----		18-Mar-2024	7 days	6 days	✓
Physical Tests : TSS by Gravimetry										
HDPE										
SQU US 1	E160	12-Mar-2024	----	----	----		18-Mar-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 Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Speciated Metals : Total Hexavalent Chromium (Cr VI) by IC										
UV-inhibited HDPE - total (sodium hydroxide)										
SQU DS 1	E532	12-Mar-2024	----	----	----		14-Mar-2024	28 days	2 days	✓
Speciated Metals : Total Hexavalent Chromium (Cr VI) by IC										
UV-inhibited HDPE - total (sodium hydroxide)										
SQU US 1	E532	12-Mar-2024	----	----	----		14-Mar-2024	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial - total (lab preserved)										
SQU DS 1	E508	12-Mar-2024	14-Mar-2024	28 days	2 days	✓	14-Mar-2024	28 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial - total (lab preserved)										
SQU US 1	E508	12-Mar-2024	14-Mar-2024	28 days	2 days	✓	14-Mar-2024	28 days	2 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
SQU DS 1	E420	12-Mar-2024	13-Mar-2024	180 days	1 days	✓	15-Mar-2024	180 days	3 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
SQU US 1	E420	12-Mar-2024	13-Mar-2024	180 days	1 days	✓	15-Mar-2024	180 days	3 days	✓
Total Sulfides : Total Sulfide by Colourimetry (Automated Flow)										
HDPE total (zinc acetate+sodium hydroxide)										
SQU DS 1	E395	12-Mar-2024	----	----	----		18-Mar-2024	7 days	6 days	✓
Total Sulfides : Total Sulfide by Colourimetry (Automated Flow)										
HDPE total (zinc acetate+sodium hydroxide)										
SQU US 1	E395	12-Mar-2024	----	----	----		18-Mar-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			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	1366360	1	9	11.1	5.0	✓
Ammonia by Fluorescence	E298	1364381	1	8	12.5	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	1366366	1	4	25.0	5.0	✓
Chloride in Water by IC	E235.Cl	1366365	1	17	5.8	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1365616	1	18	5.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1363894	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1364376	1	14	7.1	5.0	✓
Fluoride in Water by IC	E235.F	1366364	1	10	10.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1366363	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1366367	1	17	5.8	5.0	✓
Sulfate in Water by IC	E235.SO4	1366368	1	17	5.8	5.0	✓
TDS by Gravimetry	E162	1370504	1	3	33.3	5.0	✓
Total Hexavalent Chromium (Cr VI) by IC	E532	1366390	1	19	5.2	5.0	✓
Total Mercury in Water by CVAAS	E508	1367078	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1363880	1	19	5.2	5.0	✓
Total Nitrogen by Colourimetry	E366	1364383	1	2	50.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1364382	1	8	12.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1364380	1	8	12.5	5.0	✓
Total Sulfide by Colourimetry (Automated Flow)	E395	1370770	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	1370502	1	5	20.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	1366360	1	9	11.1	5.0	✓
Ammonia by Fluorescence	E298	1364381	1	8	12.5	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	1366366	1	4	25.0	5.0	✓
Chloride in Water by IC	E235.Cl	1366365	1	17	5.8	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1365616	1	18	5.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1363894	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1364376	1	14	7.1	5.0	✓
Fluoride in Water by IC	E235.F	1366364	1	10	10.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1366363	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1366367	1	17	5.8	5.0	✓
Sulfate in Water by IC	E235.SO4	1366368	1	17	5.8	5.0	✓
TDS by Gravimetry	E162	1370504	1	3	33.3	5.0	✓
Total Hexavalent Chromium (Cr VI) by IC	E532	1366390	1	19	5.2	5.0	✓
Total Mercury in Water by CVAAS	E508	1367078	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1363880	1	19	5.2	5.0	✓

Matrix: **Water**

Evaluation: × = QC frequency outside specification; ✓ = QC frequency within specification.

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Control Samples (LCS) - Continued							
Total Nitrogen by Colourimetry	E366	1364383	1	2	50.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1364382	1	8	12.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1364380	1	8	12.5	5.0	✓
Total Sulfide by Colourimetry (Automated Flow)	E395	1370770	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	1370502	1	5	20.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	1366360	1	9	11.1	5.0	✓
Ammonia by Fluorescence	E298	1364381	1	8	12.5	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	1366366	1	4	25.0	5.0	✓
Chloride in Water by IC	E235.Cl	1366365	1	17	5.8	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1365616	1	18	5.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1363894	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1364376	1	14	7.1	5.0	✓
Fluoride in Water by IC	E235.F	1366364	1	10	10.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1366363	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1366367	1	17	5.8	5.0	✓
Sulfate in Water by IC	E235.SO4	1366368	1	17	5.8	5.0	✓
TDS by Gravimetry	E162	1370504	1	3	33.3	5.0	✓
Total Hexavalent Chromium (Cr VI) by IC	E532	1366390	1	19	5.2	5.0	✓
Total Mercury in Water by CVAAS	E508	1367078	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1363880	2	19	10.5	5.0	✓
Total Nitrogen by Colourimetry	E366	1364383	1	2	50.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1364382	1	8	12.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1364380	1	8	12.5	5.0	✓
Total Sulfide by Colourimetry (Automated Flow)	E395	1370770	1	20	5.0	5.0	✓
TSS by Gravimetry	E160	1370502	1	5	20.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	1364381	1	8	12.5	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	1366366	1	4	25.0	5.0	✓
Chloride in Water by IC	E235.Cl	1366365	1	17	5.8	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1365616	1	18	5.5	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1363894	1	18	5.5	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1364376	1	14	7.1	5.0	✓
Fluoride in Water by IC	E235.F	1366364	1	10	10.0	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1366363	1	20	5.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1366367	1	17	5.8	5.0	✓
Sulfate in Water by IC	E235.SO4	1366368	1	17	5.8	5.0	✓
Total Hexavalent Chromium (Cr VI) by IC	E532	1366390	1	19	5.2	5.0	✓
Total Mercury in Water by CVAAS	E508	1367078	1	20	5.0	5.0	✓

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Matrix Spikes (MS) - Continued							
Total Metals in Water by CRC ICPMS	E420	1363880	1	19	5.2	5.0	✓
Total Nitrogen by Colourimetry	E366	1364383	1	2	50.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1364382	1	8	12.5	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1364380	1	8	12.5	5.0	✓
Total Sulfide by Colourimetry (Automated Flow)	E395	1370770	1	20	5.0	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 ± 1°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 ± 2°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 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 methlyene blue colourimetric method. Results expressed "as H_2S" if reported represent the maximum possible H_2S concentration based on the total sulfide concentration in the sample. The H_2S calculation converts Total Sulphide as (S2-) and reports it as Total Sulphide as (H_2S)
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 - Waterloo	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 Hardness (Calculated)	EC100 ALS Environmental - Vancouver	Water	APHA 2340B	“Hardness (as CaCO3), dissolved” is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 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 CaCO3), from total Ca/Mg” is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO3 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 - Waterloo	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.
Field pH,EC,Salinity,Cl2,ClO2,ORP,DO, Turbidity,T,T-P,o-PO4,NH3,Chloramine	EF001 ALS Environmental - Vancouver	Water	Field Measurement (Client Supplied)	Field pH,EC,Salinity,Cl2,ClO2,ORP,DO, Turbidity,T,T-P,o-PO4,NH3 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.
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

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
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.

ALS Canada Ltd.

QUALITY CONTROL REPORT

Work Order	: **VA24A5115**	Page	: 1 of 18
Client	: Triton Environmental Consultants Ltd.	Laboratory	: ALS Environmental - Vancouver
Contact		Account Manager	
Address		Address	
Telephone		Telephone	
Project	: 11964	Date Samples Received	: 12-Mar-2024 13:35
PO	: 11964-Task20-Phase 3C-4C	Date Analysis Commenced	: 13-Mar-2024
C-O-C number	: ----	Issue Date	: 20-Mar-2024 10:09
Sampler	: ---- 604 631 2213		
Site	: ----		
Quote number	: VA23-TRIT100-003		
No. of samples received	: 2		
No. of samples analysed	: 2		

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.

Signatories	*Position*	*Laboratory Department*
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Nik Perkio	Inorganics Analyst	Waterloo Inorganics, Waterloo, Ontario
Nik Perkio	Inorganics Analyst	Waterloo Metals, Waterloo, Ontario
Owen Cheng		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: 1366360)											
VA24A5175-001	Anonymous	Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	132	136	2.98%	20%	----
Physical Tests (QC Lot: 1370502)											
VA24A5115-001	SQU DS 1	Solids, total suspended [TSS]	----	E160	3.0	mg/L	4.3	<3.0	1.3	Diff <2x LOR	----
Physical Tests (QC Lot: 1370504)											
VA24A5115-001	SQU DS 1	Solids, total dissolved [TDS]	----	E162	13	mg/L	49	46	4	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1364380)											
KS2400807-003	Anonymous	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.115	0.115	0.0606%	20%	----
Anions and Nutrients (QC Lot: 1364381)											
KS2400807-001	Anonymous	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.149	0.151	1.30%	20%	----
Anions and Nutrients (QC Lot: 1364383)											
VA24A5115-001	SQU DS 1	Nitrogen, total	7727-37-9	E366	0.030	mg/L	0.240	0.231	0.009	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1366363)											
VA24A5115-001	SQU DS 1	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0541	0.0539	0.394%	20%	----
Anions and Nutrients (QC Lot: 1366364)											
VA24A5115-001	SQU DS 1	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.021	0.021	0.00005	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1366365)											
VA24A5115-001	SQU DS 1	Chloride	16887-00-6	E235.Cl	0.50	mg/L	2.88	2.86	0.02	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1366366)											
VA24A5115-001	SQU DS 1	Bromide	24959-67-9	E235.Br-L	0.050	mg/L	<0.050	<0.050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1366367)											
VA24A5115-001	SQU DS 1	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	0.0018	0.0013	0.0005	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1366368)											
VA24A5115-001	SQU DS 1	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	5.01	4.96	0.971%	20%	----
Organic / Inorganic Carbon (QC Lot: 1364376)											
VA24A5115-001	SQU DS 1	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	1.92	1.88	0.04	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 1364382)											
KS2400807-001	Anonymous	Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	0.72	0.83	0.12	Diff <2x LOR	----
Total Sulfides (QC Lot: 1370770)											
CG2403068-001	Anonymous	Sulfide, total (as S)	18496-25-8	E395	0.0015	mg/L	<0.0015	<0.0015	0	Diff <2x LOR	----
Total Metals (QC Lot: 1363880)											

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: 1363880) - continued											
KS2400807-001	Anonymous	Aluminum, total	7429-90-5	E420	0.0030	mg/L	1.02	1.10	7.62%	20%	----
		Antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00317	0.00322	1.48%	20%	----
		Barium, total	7440-39-3	E420	0.00010	mg/L	0.0402	0.0430	6.78%	20%	----
		Beryllium, total	7440-41-7	E420	0.000020	mg/L	0.000031	0.000032	0.000001	Diff <2x LOR	----
		Bismuth, total	7440-69-9	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Boron, total	7440-42-8	E420	0.010	mg/L	0.332	0.335	0.946%	20%	----
		Cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000218	0.0000196	0.0000022	Diff <2x LOR	----
		Calcium, total	7440-70-2	E420	0.050	mg/L	22.3	22.1	1.24%	20%	----
		Cesium, total	7440-46-2	E420	0.000010	mg/L	0.000112	0.000117	4.47%	20%	----
		Chromium, total	7440-47-3	E420	0.00050	mg/L	0.00147	0.00159	0.00012	Diff <2x LOR	----
		Cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00065	0.00076	0.00012	Diff <2x LOR	----
		Copper, total	7440-50-8	E420	0.00050	mg/L	0.00299	0.00288	0.00010	Diff <2x LOR	----
		Iron, total	7439-89-6	E420	0.010	mg/L	1.25	1.27	1.38%	20%	----
		Lead, total	7439-92-1	E420	0.000050	mg/L	0.000337	0.000353	0.000016	Diff <2x LOR	----
		Lithium, total	7439-93-2	E420	0.0010	mg/L	0.0079	0.0081	0.0002	Diff <2x LOR	----
		Magnesium, total	7439-95-4	E420	0.0050	mg/L	65.2	66.5	1.97%	20%	----
		Manganese, total	7439-96-5	E420	0.00010	mg/L	0.102	0.102	0.239%	20%	----
		Molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.0183	0.0197	7.21%	20%	----
		Nickel, total	7440-02-0	E420	0.00050	mg/L	0.00174	0.00184	0.00010	Diff <2x LOR	----
		Phosphorus, total	7723-14-0	E420	0.050	mg/L	0.204	0.204	0.0001	Diff <2x LOR	----
		Potassium, total	7440-09-7	E420	0.050	mg/L	6.12	6.02	1.61%	20%	----
		Rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00646	0.00667	3.22%	20%	----
		Selenium, total	7782-49-2	E420	0.000050	mg/L	0.000139	0.000151	0.000012	Diff <2x LOR	----
		Silicon, total	7440-21-3	E420	0.10	mg/L	12.1	12.4	1.96%	20%	----
		Silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Sodium, total	7440-23-5	E420	0.050	mg/L	306	309	1.10%	20%	----
		Strontium, total	7440-24-6	E420	0.00020	mg/L	1.39	1.49	6.94%	20%	----
		Sulfur, total	7704-34-9	E420	0.50	mg/L	107	107	0.0170%	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	0.000020	0.000020	0.00000008	Diff <2x LOR	----
		Thorium, total	7440-29-1	E420	0.00010	mg/L	0.00014	0.00015	0.00001	Diff <2x LOR	----
		Tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Titanium, total	7440-32-6	E420	0.00030	mg/L	0.0435	0.0484	10.6%	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: 1363880) - continued											
KS2400807-001	Anonymous	Tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Uranium, total	7440-61-1	E420	0.000010	mg/L	0.0118	0.0121	2.74%	20%	----
		Vanadium, total	7440-62-2	E420	0.00050	mg/L	0.00453	0.00480	0.00027	Diff <2x LOR	----
		Zinc, total	7440-66-6	E420	0.0030	mg/L	0.0030	0.0035	0.0005	Diff <2x LOR	----
		Zirconium, total	7440-67-7	E420	0.00020	mg/L	0.00107	0.00112	0.00005	Diff <2x LOR	----
Total Metals (QC Lot: 1367078)											
KS2400800-001	Anonymous	Mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 1363894)											
KS2400807-001	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0021	0.0018	0.0003	Diff <2x LOR	----
		Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00337	0.00355	5.28%	20%	----
		Barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0203	0.0202	0.588%	20%	----
		Beryllium, dissolved	7440-41-7	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		Bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Boron, dissolved	7440-42-8	E421	0.010	mg/L	0.351	0.370	5.44%	20%	----
		Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000050	0.0000072	0.0000022	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.050	mg/L	22.7	23.5	3.25%	20%	----
		Cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000065	0.000064	0.0000008	Diff <2x LOR	----
		Chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00013	0.00013	0.0000005	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.010	mg/L	0.033	0.033	0.0001	Diff <2x LOR	----
		Lead, dissolved	7439-92-1	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0080	0.0081	0.0001	Diff <2x LOR	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	71.8	72.7	1.25%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.0568	0.0569	0.0913%	20%	----
		Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.0166	0.0169	1.56%	20%	----
		Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Phosphorus, dissolved	7723-14-0	E421	0.050	mg/L	0.092	0.096	0.003	Diff <2x LOR	----
		Potassium, dissolved	7440-09-7	E421	0.050	mg/L	6.46	6.60	2.26%	20%	----
		Rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00629	0.00635	0.866%	20%	----
		Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Silicon, dissolved	7440-21-3	E421	0.050	mg/L	11.3	11.4	0.0804%	20%	----
		Silver, dissolved	7440-22-4	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----

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: 1363894) - continued											
KS2400807-001	Anonymous	Sodium, dissolved	7440-23-5	E421	0.050	mg/L	329	327	0.710%	20%	----
		Strontium, dissolved	7440-24-6	E421	0.00020	mg/L	1.55	1.59	2.46%	20%	----
		Sulfur, dissolved	7704-34-9	E421	0.50	mg/L	118	119	0.704%	20%	----
		Tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		Tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.0116	0.0116	0.408%	20%	----
		Vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		Zirconium, dissolved	7440-67-7	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 1365616)											
VA24A5083-003	Anonymous	Mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Speciated Metals (QC Lot: 1366390)											
VA24A5080-001	Anonymous	Chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----

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: 1366360)						
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 1370502)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Physical Tests (QCLot: 1370504)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Anions and Nutrients (QCLot: 1364380)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 1364381)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1364383)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 1366363)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1366364)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1366365)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 1366366)						
Bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 1366367)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 1366368)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Organic / Inorganic Carbon (QCLot: 1364376)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 1364382)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Total Sulfides (QCLot: 1370770)						
Sulfide, total (as S)	18496-25-8	E395	0.0015	mg/L	<0.0015	----
Total Metals (QCLot: 1363880)						
Aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	MBRR
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: 1363880) - 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	MBRR
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	MBRR
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: 1363880) - 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: 1367078)						
Mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 1363894)						
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	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	<0.50	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	<0.00020	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 1363894) - continued						
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: 1365616)						
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Speciated Metals (QCLot: 1366390)						
Chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.0005	mg/L	<0.00050	----

Qualifiers

Qualifier	Description
MBRR	*Initial MB for this submission had positive results for flagged analyte (data not shown). Low level samples were repeated with new QC (2nd MB results shown). High level results (>5x initial MB level) and non-detect results were reported and are defensible*

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				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1366360)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	110	85.0	115	----
Physical Tests (QCLot: 1370502)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	108	85.0	115	----
Physical Tests (QCLot: 1370504)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	96.0	85.0	115	----
Anions and Nutrients (QCLot: 1364380)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	95.1	80.0	120	----
Anions and Nutrients (QCLot: 1364381)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	95.0	85.0	115	----
Anions and Nutrients (QCLot: 1364383)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	97.1	75.0	125	----
Anions and Nutrients (QCLot: 1366363)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	99.4	90.0	110	----
Anions and Nutrients (QCLot: 1366364)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	91.4	90.0	110	----
Anions and Nutrients (QCLot: 1366365)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.3	90.0	110	----
Anions and Nutrients (QCLot: 1366366)									
Bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	101	85.0	115	----
Anions and Nutrients (QCLot: 1366367)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	98.1	90.0	110	----
Anions and Nutrients (QCLot: 1366368)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	100	90.0	110	----
Organic / Inorganic Carbon (QCLot: 1364376)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	98.2	80.0	120	----
Organic / Inorganic Carbon (QCLot: 1364382)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	103	80.0	120	----
Total Sulfides (QCLot: 1370770)									
Sulfide, total (as S)	18496-25-8	E395	0.0015	mg/L	0.08 mg/L	108	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 1363880)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	99.7	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	105	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	103	80.0	120	----
Barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	98.8	80.0	120	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	98.8	80.0	120	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	103	80.0	120	----
Boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	96.5	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	102	80.0	120	----
Calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	97.2	80.0	120	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	99.8	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	102	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	98.0	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	97.3	80.0	120	----
Iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	91.2	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	103	80.0	120	----
Lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	97.0	80.0	120	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	101	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	99.3	80.0	120	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	104	80.0	120	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	98.8	80.0	120	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	103	80.0	120	----
Potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	91.6	80.0	120	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	104	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	98.5	80.0	120	----
Silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	102	80.0	120	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	97.2	80.0	120	----
Sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	99.0	80.0	120	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	101	80.0	120	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	91.1	80.0	120	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	104	80.0	120	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	106	80.0	120	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	101	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	97.5	80.0	120	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	102	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 1363880) - continued									
Uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	106	80.0	120	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	98.9	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	105	80.0	120	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
Total Metals (QCLot: 1367078)									
Mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	102	80.0	120	----
Dissolved Metals (QCLot: 1363894)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	98.1	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	99.7	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	102	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	95.6	80.0	120	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	95.2	80.0	120	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	96.1	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	99.2	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	96.1	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	97.7	80.0	120	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	98.8	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	94.2	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	94.3	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	95.4	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	95.9	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	95.4	80.0	120	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	103	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	104	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	95.4	80.0	120	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	96.4	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	96.2	80.0	120	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	101	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	97.2	80.0	120	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	95.7	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	97.9	80.0	120	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	104	80.0	120	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	90.9	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	95.6	80.0	120	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	97.3	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 1363894) - continued									
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	88.9	80.0	120	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	98.0	80.0	120	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	88.2	80.0	120	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	97.5	80.0	120	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	92.8	80.0	120	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	94.0	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	95.6	80.0	120	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	98.2	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	96.1	80.0	120	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	93.9	80.0	120	----
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	99.4	80.0	120	----
Speciated Metals (QCLot: 1366390)									
Chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.0005	mg/L	0.025 mg/L	98.1	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: 1364380)										
KS2400807-004	Anonymous	Phosphorus, total	7723-14-0	E372-U	ND mg/L	0.05 mg/L	ND	70.0	130	----
Anions and Nutrients (QCLot: 1364381)										
KS2400807-002	Anonymous	Ammonia, total (as N)	7664-41-7	E298	ND mg/L	0.1 mg/L	ND	75.0	125	----
Anions and Nutrients (QCLot: 1364383)										
VA24A5115-002	SQU US 1	Nitrogen, total	7727-37-9	E366	0.367 mg/L	0.4 mg/L	91.8	70.0	130	----
Anions and Nutrients (QCLot: 1366363)										
VA24A5115-002	SQU US 1	Nitrate (as N)	14797-55-8	E235.NO3-L	2.48 mg/L	2.5 mg/L	99.1	75.0	125	----
Anions and Nutrients (QCLot: 1366364)										
VA24A5115-002	SQU US 1	Fluoride	16984-48-8	E235.F	0.991 mg/L	1 mg/L	99.1	75.0	125	----
Anions and Nutrients (QCLot: 1366365)										
VA24A5115-002	SQU US 1	Chloride	16887-00-6	E235.Cl	99.0 mg/L	100 mg/L	99.0	75.0	125	----
Anions and Nutrients (QCLot: 1366366)										
VA24A5115-002	SQU US 1	Bromide	24959-67-9	E235.Br-L	0.513 mg/L	0.5 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 1366367)										
VA24A5115-002	SQU US 1	Nitrite (as N)	14797-65-0	E235.NO2-L	0.491 mg/L	0.5 mg/L	98.3	75.0	125	----
Anions and Nutrients (QCLot: 1366368)										
VA24A5115-002	SQU US 1	Sulfate (as SO4)	14808-79-8	E235.SO4	99.1 mg/L	100 mg/L	99.1	75.0	125	----
Organic / Inorganic Carbon (QCLot: 1364376)										
VA24A5115-002	SQU US 1	Carbon, dissolved organic [DOC]	----	E358-L	5.20 mg/L	5 mg/L	104	70.0	130	----
Organic / Inorganic Carbon (QCLot: 1364382)										
KS2400807-002	Anonymous	Carbon, total organic [TOC]	----	E355-L	5.11 mg/L	5 mg/L	102	70.0	130	----
Total Sulfides (QCLot: 1370770)										
CG2403068-003	Anonymous	Sulfide, total (as S)	18496-25-8	E395	0.233 mg/L	0.2 mg/L	116	75.0	125	----
Total Metals (QCLot: 1363880)										
KS2400807-002	Anonymous	Aluminum, total	7429-90-5	E420	ND mg/L	0.4 mg/L	ND	70.0	130	----
		Antimony, total	7440-36-0	E420	0.0402 mg/L	0.04 mg/L	100	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.0405 mg/L	0.04 mg/L	101	70.0	130	----
		Barium, total	7440-39-3	E420	ND mg/L	0.04 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: 1363880) - continued										
KS2400807-002	Anonymous	Beryllium, total	7440-41-7	E420	0.0778 mg/L	0.08 mg/L	97.3	70.0	130	----
		Bismuth, total	7440-69-9	E420	0.0186 mg/L	0.02 mg/L	93.3	70.0	130	----
		Boron, total	7440-42-8	E420	ND mg/L	0.2 mg/L	ND	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.00800 mg/L	0.008 mg/L	100.0	70.0	130	----
		Calcium, total	7440-70-2	E420	7.78 mg/L	8 mg/L	97.3	70.0	130	----
		Cesium, total	7440-46-2	E420	0.0200 mg/L	0.02 mg/L	99.9	70.0	130	----
		Chromium, total	7440-47-3	E420	0.0775 mg/L	0.08 mg/L	96.8	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.0377 mg/L	0.04 mg/L	94.2	70.0	130	----
		Copper, total	7440-50-8	E420	0.0368 mg/L	0.04 mg/L	92.0	70.0	130	----
		Iron, total	7439-89-6	E420	3.60 mg/L	4 mg/L	90.0	70.0	130	----
		Lead, total	7439-92-1	E420	0.0371 mg/L	0.04 mg/L	92.8	70.0	130	----
		Lithium, total	7439-93-2	E420	0.190 mg/L	0.2 mg/L	95.1	70.0	130	----
		Magnesium, total	7439-95-4	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		Manganese, total	7439-96-5	E420	ND mg/L	0.04 mg/L	ND	70.0	130	----
		Molybdenum, total	7439-98-7	E420	0.0429 mg/L	0.04 mg/L	107	70.0	130	----
		Nickel, total	7440-02-0	E420	0.0754 mg/L	0.08 mg/L	94.2	70.0	130	----
		Phosphorus, total	7723-14-0	E420	19.3 mg/L	20 mg/L	96.6	70.0	130	----
		Potassium, total	7440-09-7	E420	7.16 mg/L	8 mg/L	89.5	70.0	130	----
		Rubidium, total	7440-17-7	E420	0.0381 mg/L	0.04 mg/L	95.3	70.0	130	----
		Selenium, total	7782-49-2	E420	0.0766 mg/L	0.08 mg/L	95.7	70.0	130	----
		Silicon, total	7440-21-3	E420	19.2 mg/L	20 mg/L	95.8	70.0	130	----
		Silver, total	7440-22-4	E420	0.00792 mg/L	0.008 mg/L	99.0	70.0	130	----
		Sodium, total	7440-23-5	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		Strontium, total	7440-24-6	E420	ND mg/L	0.04 mg/L	ND	70.0	130	----
		Sulfur, total	7704-34-9	E420	ND mg/L	40 mg/L	ND	70.0	130	----
		Tellurium, total	13494-80-9	E420	0.0841 mg/L	0.08 mg/L	105	70.0	130	----
		Thallium, total	7440-28-0	E420	0.00727 mg/L	0.008 mg/L	90.9	70.0	130	----
		Thorium, total	7440-29-1	E420	0.0385 mg/L	0.04 mg/L	96.3	70.0	130	----
		Tin, total	7440-31-5	E420	0.0399 mg/L	0.04 mg/L	99.8	70.0	130	----
		Titanium, total	7440-32-6	E420	0.0783 mg/L	0.08 mg/L	97.9	70.0	130	----
		Tungsten, total	7440-33-7	E420	0.0385 mg/L	0.04 mg/L	96.2	70.0	130	----
		Uranium, total	7440-61-1	E420	0.00766 mg/L	0.008 mg/L	95.8	70.0	130	----
		Vanadium, total	7440-62-2	E420	0.191 mg/L	0.2 mg/L	95.7	70.0	130	----
		Zinc, total	7440-66-6	E420	0.806 mg/L	0.8 mg/L	101	70.0	130	----
		Zirconium, total	7440-67-7	E420	0.0851 mg/L	0.08 mg/L	106	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: 1367078)										
KS2400807-001	Anonymous	Mercury, total	7439-97-6	E508	0.000110 mg/L	0.0001 mg/L	110	70.0	130	----
Dissolved Metals (QCLot: 1363894)										
KS2400807-003	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.394 mg/L	0.4 mg/L	98.6	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.0397 mg/L	0.04 mg/L	99.3	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.0402 mg/L	0.04 mg/L	100	70.0	130	----
		Barium, dissolved	7440-39-3	E421	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Beryllium, dissolved	7440-41-7	E421	0.0739 mg/L	0.08 mg/L	92.4	70.0	130	----
		Bismuth, dissolved	7440-69-9	E421	0.0172 mg/L	0.02 mg/L	86.2	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	0.00772 mg/L	0.008 mg/L	96.6	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	0.0208 mg/L	0.02 mg/L	104	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.0756 mg/L	0.08 mg/L	94.5	70.0	130	----
		Cobalt, dissolved	7440-48-4	E421	0.0374 mg/L	0.04 mg/L	93.5	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.0360 mg/L	0.04 mg/L	90.0	70.0	130	----
		Iron, dissolved	7439-89-6	E421	3.70 mg/L	4 mg/L	92.6	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.0358 mg/L	0.04 mg/L	89.6	70.0	130	----
		Lithium, dissolved	7439-93-2	E421	0.185 mg/L	0.2 mg/L	92.4	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	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Molybdenum, dissolved	7439-98-7	E421	0.0409 mg/L	0.04 mg/L	102	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.0748 mg/L	0.08 mg/L	93.5	70.0	130	----
		Phosphorus, dissolved	7723-14-0	E421	21.7 mg/L	20 mg/L	109	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	8.16 mg/L	8 mg/L	102	70.0	130	----
		Rubidium, dissolved	7440-17-7	E421	0.0384 mg/L	0.04 mg/L	96.0	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.0758 mg/L	0.08 mg/L	94.8	70.0	130	----
		Silicon, dissolved	7440-21-3	E421	21.0 mg/L	20 mg/L	105	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.00700 mg/L	0.008 mg/L	87.5	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	0.0805 mg/L	0.08 mg/L	101	70.0	130	----
		Thallium, dissolved	7440-28-0	E421	0.00696 mg/L	0.008 mg/L	87.0	70.0	130	----
		Thorium, dissolved	7440-29-1	E421	0.0382 mg/L	0.04 mg/L	95.4	70.0	130	----
		Tin, dissolved	7440-31-5	E421	0.0404 mg/L	0.04 mg/L	101	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: 1363894) - continued										
KS2400807-003	Anonymous	Titanium, dissolved	7440-32-6	E421	0.0828 mg/L	0.08 mg/L	104	70.0	130	----
		Tungsten, dissolved	7440-33-7	E421	0.0376 mg/L	0.04 mg/L	94.0	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	0.00735 mg/L	0.008 mg/L	91.9	70.0	130	----
		Vanadium, dissolved	7440-62-2	E421	0.199 mg/L	0.2 mg/L	99.7	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	0.764 mg/L	0.8 mg/L	95.6	70.0	130	----
		Zirconium, dissolved	7440-67-7	E421	0.0872 mg/L	0.08 mg/L	109	70.0	130	----
Dissolved Metals (QCLot: 1365616)										
VA24A5100-001	Anonymous	Mercury, dissolved	7439-97-6	E509	0.000100 mg/L	0.0001 mg/L	100	70.0	130	----
Speciated Metals (QCLot: 1366390)										
VA24A5080-001	Anonymous	Chromium, hexavalent [Cr VI], total	18540-29-9	E532	0.0397 mg/L	0.04 mg/L	99.3	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

ALS Environmental
www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Affix ALS barcode label here (lab use only)

COC Number: 17 -

Page 1 of

Report To	Contact and company name below will appear on the final report
Company:	Triton Environmental
Contact:	
Phone:	
Street:	
City/Province:	
Postal Code:	V6E 4M3
Invoice To	Same as Report To ☐ YES ☑ NO
	Copy of Invoice with Report ☐ YES ☑ NO
Company:	
Contact:	

Report Format / Distribution

Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Quality Control (QC) Report with Report ☑ ☐ NO
☑ Compare Results to Criteria on Report - provide details below if box
Select Distribution: ☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax
Email 2
Email 3
Select Invoice
Email 1 or Fax
Email 2

Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)

Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply

PRIORITY (Business Days): 4 day [P4-20%] ☐ | 3 day [P3-25%] ☐ | 2 day [P2-50%] ☐

EMERGENCY: 1 Business day [E1 - 100%] ☐ | Same Day, Weekend or Statutory holiday [E2 - 200% (Laboratory opening fees may apply)] ☐

Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm

For tests that can not be performed according to the service level selected, you will be contacted.

Project Information

ALS Account # / Quote #:	~~VA23-TRIT100-012 VA23-TRIT~~
Job #:	11964 VA23-TRIT-100-003
PO / AFE:	11964 - Task 20 - Phase 3C-4C
LSD:	
ALS Lab Work Order # (lab use only):	

Oil and Gas Required Fields (client use)

AFE/Cost Center:	PO#
Major/Minor Code:	Routing Code:
Requisitioner:	
Location:	
ALS Contact: Can Dang	Sampler:

Analysis Request

Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below

ALS Sample # (lab use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	Total metals + mercury	Dissolved metals + mercury	Total hexavalent chromium	Total trivalent chromium	TSS	TDS	Nutrients (ammonia, ammonium, total nitrogen, total phosphorus, TOC)	Total sulfide (as H2S), Unionized Sulfide	Anions scan (Br, Cl, F, NO2, NO3, SO4)	General parameters (alkalinity)	DOC	Dissolved hexavalent and trivalent chromium				SAMPLES ON HOLD	Sample is hazardous (please provide further details	NUMBER OF CONTAINERS
						F					P	P			F/P	F						
	SQU DS 1	12-Mar-24	11:40	Water	R	R	R	R	R	R	R	R	R	R	R	R					N	~~12~~ 9
	pH: 7.09 cond: 5145 temp: 5.6																					
	SQU US 1	12-Mar-24	11:21	Water	R	R	R	R	R	R	R	R	R	R	R	R					N	~~12~~ 9
	pH: 7.05 cond: 6045 temp: 6.3																					
	~~Duplicate~~			~~Water~~	R	R	R	R	R	R	R	R	R	R	R	R					N	~~12~~
	~~Field Blank~~			~~Water~~	R	R	R	R	R	R	R	R	R	R	R	R					M	~~12~~
	~~Trip Blank~~			~~Water~~	R	R			R	R	R	R	R	R							N	~~3~~

Environmental Division
Vancouver
Work Order Reference
VA24A5115

Telephone : +1 604 253 4188

Drinking Water (DW) Samples[1] (client use)

Are samples taken from a Regulated DW System? ☐ ☑

Are samples for human consumption/ use? ☐ ☑

Special Instructions / Spec

Triton Project # 11964

-down list below

SAMPLE CONDITION AS RECEIVED (lab use only)

Frozen ☐ SIF Observations Yes ☐ No ☐
Ice Packs ☑ Ice Cubes ☐ Custody seal intact Yes ☐ No ☐
Cooling Initiated ☐

INITIAL COOLER TEMPERATURES °C			FINAL COOLER TEMPERATURES °C		

RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
	Time:		Received by:	Date:	Time:	Received by:	Date:	Time
Mar 12 24	13:30						3/12/24	1-3520

NS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

SEPT 2011 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use of this form the user acknowledges and agrees with the Terms and Conditions as specified on the back page of the white - report copy.

1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form.**

Receiving Environment Field Notes and Logs

FortisBC Eagle Mountain-Woodfibre Gas Pipeline

Water Discharge Authorization Water Quality Monitoring

2024-3-12-Chan-5DCA9

Project Component:	Tunnel	**Site Name:**	Receiving Environment - Downstream of Discharge
Inspection Date:	03/12/2024	**Location:**	BC Rail Site
Triton QP:	Aegean Chan	**Latitude/Longitude:**	49.725282 -123.165175
Temperature(c):	Low 2 High 5	**Permit:**	AE 111824
Weather Conditions:	Light Rain	**Ground Conditions:**	Wet

Observations

Time: 11:40:04 **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:** Total hexavalent and trivalent chromium
Dissolved Metals + Mercury	Yes	**Total Sulfide, Unionized Sulfide**	Yes	
TSS	Yes	**Anions**	Yes	
TDS	Yes	**VOC/VPH**	No	**QA Samples:** No Total hexavalent and trivalent chromium
Nutrients	Yes	**EPH, PAH, LEPH/HEPH**	No	
DOC	Yes	**Trout LC50**	No	

Logger Maintenance

Logger Maintenance Performed?	No	**Photo of COC with Lab Signature?**	Yes

Describe Logger Maintenance

Photos

Photo: 1

Location: SQU DS

Description: Standing on the bank looking straight out at the data logger.

Photo: 2

Location: SQU DS

Description: Standing at the data logger looking downstream.

Photos

Photo: 3

Location: SQU DS

Description: Standing at the data logger looking upstream.

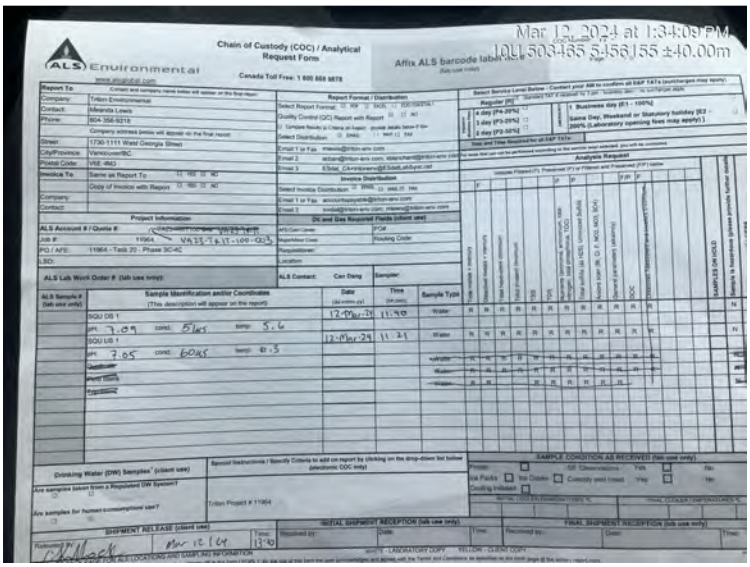

Photo: 4

Location: Burnaby BC

Description: COC

Sign Off

Report Prepared By: Aegean Chan

Report Reviewer: Miranda Lewis

Name:

Designation:

Designation Number:

Report Reviewed: Yes

Professional(s) of Record: N/A

FortisBC Eagle Mountain-Woodfibre Gas Pipeline

Water Discharge Authorization Water Quality Monitoring

2024-3-12-Chan-C0EB9

Project Component:	Tunnel	**Site Name:**	Receiving Environment - Upstream of Discharge
Inspection Date:	03/12/2024	**Location:**	BC Rail Site
Triton QP:	Aegean Chan	**Latitude/Longitude:**	49.726866 -123.163912
Temperature(c):	Low 2 High 5	**Permit:**	AE 111824
Weather Conditions:	Light Rain	**Ground Conditions:**	Wet

Observations

Time: 11:15:49 **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:**	Total Chromium
Dissolved Metals + Mercury	Yes	**Total Sulfide, Unionized Sulfide**	Yes		
TSS	Yes	**Anions**	Yes		
TDS	Yes	**VOC/VPH**	No	**QA Samples:**	No
Nutrients	Yes	**EPH, PAH, LEPH/HEPH**	No	Total Chromium	
DOC	Yes	**Trout LC50**	No		

Logger Maintenance

Logger Maintenance Performed?	No	**Photo of COC with Lab Signature?**	Yes

Describe Logger Maintenance

Photos

Photo: 1

Location: SQU US

Description: Standing at the data logger looking straight out.

Photo: 2

Location: SQU US

Description: Standing at the data logger looking downstream.

Photos

Photo: 3

Location: SQU US

Description: Standing at the data logger looking upstream.

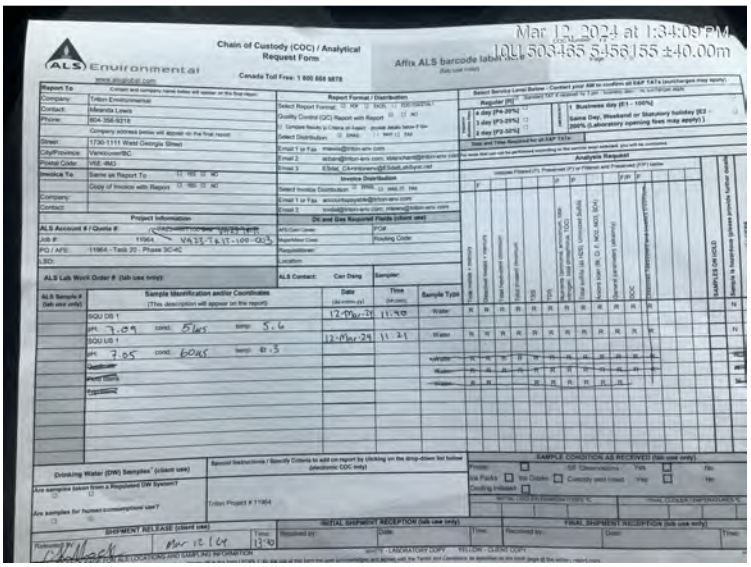

Photo: 4

Location: Burnaby BC

Description: COC

Sign Off

Report Prepared By:	Aegean Chan	**Report Reviewed:**	Yes
Report Reviewer:	Miranda Lewis	**Professional(s) of Record:**	N/A
Name:			
Designation:			
Designation Number:			