Eagle Mountain - Woodfibre Gas Pipeline Project

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

Report Period: Initial Report
December 8th, 2023 to January 2nd, 2024

Contents

Preamble

This report is the initial report for the British Columbia Energy Regulator (BCER) Waste Discharge Approval (BCER number AE 111973) for the FortisBC Eagle Mountain – Woodfibre Gas Pipeline (EGP) Project for the BC Rail site. This initial report covers the reporting period from December 8th, 2023 to January 2nd, 2024 and includes the results of water quality monitoring and sampling of the receiving environment (upstream and downstream) at the Woodfibre Site. During this timeframe no discharge into the receiving environment at the Woodfibre Site occurred from the water treatment plant.

FortisBC has retained Triton Environmental Consultants Ltd. as the Qualified Professional to implement and oversee the monitoring and sampling program in the receiving environment. The data represented below, including laboratory reported exceedances, represent background conditions of the receiving environment, and are not related to EGP Project activities. The data collected and reported in this report represents background water quality conditions at the two receiving environment sampling sites as shown on the approved Waste Discharge Approval AE-111973.

Water Treatment Plant Update

Since the issuance of the Waste Discharge Approval (AE 111973) on December 8th, 2023, FortisBC's tunnel contractor Frontier-Kemper Michels Joint Venture (FKM) has commenced shipping the water treatment plant (WTP) components to the Woodfibre site. No WTP has been set up on site to date.

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-111973 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.

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

Sampling Methodology

The monitoring and sampling has been carried out in accordance with the procedures described in the most recent edition of the "British Columbia Field Sampling Manual" using field equipment and lab samples to meet daily and real time requirements for the Waste Discharge Approval.
At the receiving environment, real time daily field readings of pH, temperature, NTU, electrical conductivity, DO, ORP and salinity are being taken using an AquaTROLL 600 datalogger upstream and downstream in the watercourse at the Woodfibre site. 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 to be 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

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	No Changes, still 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	No changes, still 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 water treatment system 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

- The real time water quality monitoring equipment (sondes) were deployed at the Woodfibre Site on December 18th, 2023.
- 2 lab samples of the receiving environment have been collected to date, one on December 18th, 2023 and one on January 3rd, 2023. This report contains only the information from December 18th, 2023.
- No discharges to the receiving environment have occurred from the water treatment plant within the reporting period. The water treatment plan has not yet been built and not tunneling is occurring.

Point of Discharge from Water Treatment System Summary

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

Exceedance details

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

Receiving Environment Summary

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

Table 3: Upstream Monitoring Information

Date of Lab Sample	Real Time Monitored	Field Samples Taken	Results
2023-12-18	Yes	Yes-real time	Full set of lab sample results, photo and documentation are provided in Appendix B

Table 4: Downstream Monitoring Information

Date of Lab Sample	Real Time Monitored	Field Samples Taken	Results
2023-12-18	Yes	Yes-real time	Full set of lab sample results, photo and documentation are provided in Appendix B

Receiving Environment Monitoring Details

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

Appendix A Point of Discharge from Water Treatment Plant Documentation

No discharge from the water treatment plant, nothing to report

Appendix B Receiving Environment Documentation

Receiving Environment Sample Analysis

TRITON Environmental Consultants	Sample ID	Reviewed and signed off by:				WLNG US 1	WLNG DS 1	Sample or value notes	BCWQ FAL - Short Term	BCWQ FAL - Long Term	BCWQ MAL - Short Term	BCWQ MAL - Long Term
	LAB ID					VA23D0307-002	VA23D0307-001					
	Date Sampled					18-Dec-2023	18-Dec-2023					
	Time Sampled					09:20	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	7.8	7.66	LT guideline not applicable [3]	If natural pH < 6.5, no statisticaly 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	-	7.10	7.90		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	-	-	-	-	34	48					
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	0.15	0.42	LT guideline not applicable [3]	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.
General Parameters												
Hardness (as CaCO3) (total)	mg/L	-	-	-	-	8.05	19.9					
Total Dissolved Solids	mg/L	-	-	-	-	19	36					
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	< 3.0	LT guideline not applicable [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.
Dissolved Organic Carbon (DOC)	mg/L	-	-	-	-	2.22	1.99			Long-term (30-day) median within 20% of background median [3]		
Chemical Oxygen Demand (COD)	mg/L	-	-	-	-	15	< 10					
Total Phenols	mg/L	-	0.05	-	-	< 0.0010	< 0.0010		Interim guideline		Interim guideline	
Total Alkalinity ($CaCO_3$)	mg/L	Categorical	-	-	-	5.7	17.9	Upstream location is highly sensitive (i.e. low buffering capacity), while the downstream location is moderately sensitive to acid inputs (i.e. moderate buffering capacity). LT guideline not applicable [3]		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	< 0.0050	0.0074	LT guideline not applicable [3]	Guideline for ammonia as N. pH and temperature dependent. Refer to BC Water Quality Guidelines for more informaton.	Guideline for ammonia as N. pH and temperature dependent. Refer to BC Water Quality Guidelines for more informaton.	Guideline for ammonia as N. pH, salinity, and temperature dependent. Refer to BC Water Quality Guidelines for more informaton. Guideline not applicable to freshwater EGP samples.	Guideline for ammonia as N. pH, salinity, and temperature dependent. Refer to BC Water Quality Guidelines for more informaton. Guideline not applicable to freshwater EGP samples.
Bromide	mg/L	-	-	-	-	< 0.050	< 0.050					
Chloride	mg/L	150	600	> 110% of background	< 90% of background	1.01	0.94	LT guideline not applicable [3]			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	-	0.02	0.022		Guideline has interim status.			
Total Kjedhal Nitrogen (TKN)	mg/L	-	-	-	-	0.076	0.064					
Nitrate (as N)	mg/L	3	32.8	-	3.7	0.0771	0.0838	LT guideline not applicable [3]				
Nitrite (as N)	mg/L	Varies with chloride	Varies with chloride	-	-	< 0.0010	< 0.0010	LT guideline not applicable [3]	Guideline for nitrite varies with chloride concentrations. Refer to BC Water Quality Guidelines for tables.	Guideline for nitrite varies with chloride concentrations. Refer to BC Water Quality Guidelines for tables.		
Total Nitrogen	mg/L	-	-	-	-	0.13	0.133					
Total Phosphorous	mg/L	0.005 to 0.015	-	-	-	0.0206	0.0139	LT guideline not applicable [3]		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	-	-	-	3.5	3.71	LT guideline not applicable [3]				
Total Metals												
Aluminum (Al)-Total	mg/L	Varies with pH, DOC, hardness	-	-	-	0.1	0.0802	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 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	LT guideline not applicable [3]				
Arsenic (As)-Total	mg/L	0.005	-	-	0.0125	0.00017	0.00013	LT guideline not applicable [3]				Interim guideline status
Barium (Ba)-Total	mg/L	1	-	-	-	0.00277	0.00468	LT guideline not applicable [3]		Working guideline status		
Beryllium (Be)-Total	mg/L	0.00013	-	-	0.100	< 0.000100	< 0.000100	LT guideline not applicable [3]		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	< 0.010	LT guideline not applicable [3]				
Cadmium (Cd)-Total	mg/L	-	-	-	0.00012	0.0000056	0.0000062					Working guideline status
Calcium (Ca)-Total	mg/L	-	-	-	-	2.53	7.04					
Cesium (Cs)-Total	mg/L	-	-	-	-	< 0.000010	< 0.000010					
Chromium (Cr) - Total	mg/L	-	-	-	-	< 0.00050	< 0.00050					
Cobalt (Co)-Total	mg/L	0.004	0.11	-	-	< 0.00010	< 0.00010	LT guideline not applicable [3]				
Copper (Cu)-Total	mg/L	-	-	0.003	0.002	0.00074	0.00075					
Iron (Fe)-Total	mg/L	-	1	-	-	0.033	0.065					
Lead (Pb)-Total	mg/L	Varies with hardness	Varies with hardness	0.14	0.002	< 0.000050	< 0.000050	LT guideline not applicable [3]	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 $e^{[1.273*ln(hardness)-4.704]}$ applies to samples with hardness 8-360 mg/L.		
Lithium (Li)-Total	mg/L	-	-	-	-	< 0.0010	< 0.0010					
Magnesium (Mg)-Total	mg/L	-	-	-	-	0.421	0.556					
Manganese (Mn)-Total	mg/L	Varies with hardness	Varies with hardness	-	-	0.00135	0.00385	LT guideline not applicable [3]	Guideline varies with hardness, refer to BC Water Quality Guidelines for more information. Guideline uses equation 0.01102*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	LT guideline not applicable [3]		Guideline is calculated as follows: 0.1/[MeHg/totalHg]. When MeHg ≤ 0.5% of total Hg, guideline is equal to 0.02 mg/L		
Molybdenum (Mo)-Total	mg/L	7.6	46	-	-	0.000394	0.000614	LT guideline not applicable [3]				
Nickel (Ni)-Total	mg/L	Varies with hardness	-	-	0.0083	< 0.00050	< 0.00050	LT guideline not applicable [3]		Working guideline status. Guideline varies with hardness. Guideline is 0.025 mg/L at water hardness ≤60mg/L, at hardness 60-180 use equation $e^{[0.76[ln(hardness)]+1.06]}$, 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	LT guideline not applicable [3]		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	-	-	-	-	0.209	0.265					
Rubidium (Rb)-Total	mg/L	-	-	-	-	< 0.00020	0.0004					
Selenium (Se)-Total	mg/L	0.002	-	-	0.002	< 0.000050	< 0.000050	LT guideline not applicable [3]		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	-	-	-	-	3.78	3.9					
Silver (Ag)-Total	mg/L	Varies with hardness	Varies with hardness	0.003	0.0015	< 0.000010	< 0.000010	LT guideline not applicable [3]	Varies with hardness. Guideline is 0.0001 mgL at hardness ≤100 mg/L, and 0.003 at Hardness > 100 mg/L.	Varies with hardness. Guideline is 0.00005 mgL 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	-	-	-	-	1.62	1.66					
Strontium (Sr)-Total	mg/L	-	-	-	-	0.0109	0.0228					
Sulfur (S)-Total	mg/L	-	-	-	-	1.1	1.17					
Tellurium (Te)-Total	mg/L	-	-	-	-	< 0.00020	< 0.00020					
Thallium (Tl)-Total	mg/L	0.0008	-	-	-	< 0.000010	< 0.000010	LT guideline not applicable [3]		30-day average, site-specific objective for the lower Columbia River, BC. Guideline is for reference only and does not apply to tnhe 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	-	-	-	-	0.00086	0.00079					
Tungsten (W)-Total	mg/L	-	-	-	-	< 0.00010	< 0.00010					
Uranium (U)-Total	mg/L	0.0085	-	-	-	0.000104	0.000096	LT guideline not applicable [3]		Working guideline status		
Vanadium (V)-Total	mg/L	-	-	-	0.050	< 0.00050	< 0.00050					Working guideline status
Zinc (Zn)-Total	mg/L	-	-	0.055	0.010	< 0.0030	< 0.0030	LT guideline not applicable [3]				
Zirconium (Zr)-Total	mg/L	-	-	-	-	< 0.00020	< 0.00020					
Dissolved Metals												
Aluminum (Al)-Dissolved	mg/L	-	-	-	-	0.077	0.0607					
Antimony (Sb)-Dissolved	mg/L	-	-	-	-	< 0.00010	< 0.00010					
Arsenic (As)-Dissolved	mg/L	-	-	-	-	0.00013	0.00011					
Barium (Ba)-Dissolved	mg/L	-	-	-	-	0.00253	0.00464					
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	-	-	< 0.000005	0.0000052	LT guideline not applicable [3]	Guideline is hardness dependent, refer to BC Water Quality Guidelines for more information. Guideline is appilcable to water hardness between 7.0 and 455 mg/L. Guideline uses equation $e^{[1.03*ln(hardness)-5.275]}$. 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 $e^{[0.736*ln(hardness)-4.943]}$. Lowest value for guiedeline is 0.00004.		
Calcium (Ca)-Dissolved	mg/L	Categorical	-	-	-	2.41	6.85	Upstream location has high sensitivity to acid inputs (i.e. low buffering capacity), while the downstream location has moderate sensitivity to acid inputs (i.e. moderate buffering capacity). LT guideline not applicable [3]		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	-	-	-	-	< 0.000010	< 0.000010					
Chromium (Cr)-Dissolved	mg/L	-	-	-	-	< 0.00050	< 0.00050					
Chromium (Cr(III))-Dissolved	mg/L	-	-	-	-	-	-					
Chromium (Cr(VI))-Dissolved	mg/L	-	-	-	-	-	-					
Cobalt (Co)-Dissolved	mg/L	-	-	-	-	< 0.00010	< 0.00010					
Copper (Cu)-Dissolved	mg/L	Varies with pH, DOC, hardness	Varies with pH, DOC, hardness	-	-	***0.00064***	***0.00066***	Upstream and Downstream location exceed the long-term BCWQG for freshwater aquatic life. 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	-	-	0.02	0.023					
Lead (Pb)-Dissolved	mg/L	-	-	-	-	< 0.000050	< 0.000050					
Lithium (Li)-Dissolved	mg/L	-	-	-	-	< 0.0010	< 0.0010					
Magnesium (Mg)-Dissolved	mg/L	-	-	-	-	0.388	0.537					
Manganese (Mn)-Dissolved	mg/L	-	-	-	-	0.00064	0.00269					
Mercury (Hg)-Dissolved	mg/L	-	-	-	-	< 0.0000050	< 0.0000050					
Molybdenum (Mo)-Dissolved	mg/L	-	-	-	-	0.000388	0.000597					
Nickel (Ni)-Dissolved	mg/L	-	-	-	-	< 0.00050	< 0.00050					
Phosphorus (P)-Dissolved	mg/L	-	-	-	-	< 0.050	< 0.050					
Potassium (K)-Dissolved	mg/L	-	-	-	-	0.195	0.29					
Rubidium (Rb)-Dissolved	mg/L	-	-	-	-	0.00022	0.00045					
Selenium (Se)-Dissolved	mg/L	-	-	-	-	< 0.000050	< 0.000050					
Silicon (Si)-Dissolved	mg/L	-	-	-	-	3.74	3.91					
Silver (Ag)-Dissolved	mg/L	-	-	-	-	< 0.000010	< 0.000010					
Sodium (Na)-Dissolved	mg/L	-	-	-	-	1.48	1.59					
Strontium (Sr)-Dissolved	mg/L	-	-	-	-	0.0115	0.0235					
Sulfur (S)-Dissolved	mg/L	-	-	-	-	1.16	1.28					
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	-	-	-	-	< 0.00030	< 0.00030					
Tungsten (W)-Dissolved	mg/L	-	-	-	-	< 0.00010	< 0.00010					
Uranium (U)-Dissolved	mg/L	-	-	-	-	0.000101	0.000097					
Vanadium (V)-Dissolved	mg/L	-	-	-	-	< 0.00050	< 0.00050					
Zinc (Zn)-Dissolved	mg/L	Varies with pH, DOC, hardness	Varies with DOC and hardness	-	-	***0.0014***	***0.0039***	Upstream and downstream location exceed the long-term BCWQG for freshwater aquatic life. 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 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 Qualtiy 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 Qualtiy Guidelines for the Protection of Aquatic Life, Widlife & 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 (GUIDELINE EVALUATION)

Work Order	: **VA23D0307**	Page	: 1 of 7
Client	: **Triton Environmental Consultants Ltd.**	Laboratory	: ALS Environmental - Vancouver
Contact	:	Account Manager	:
Address	: Suite 1730, 1111 West Georgia St Vancouver BC Canada V6E 4M3	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	:	Telephone	:
Project	: 11964	Date Samples Received	: 18-Dec-2023 17:20
PO	: ----	Date Analysis Commenced	: 19-Dec-2023
C-O-C number	: ----	Issue Date	: 29-Dec-2023 12:00
Sampler	: ----		
Site	: Water Analysis		
Quote number	: VA23-TRIT100-012		
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
- Guideline Comparison

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Brooke Miller	Laboratory Analyst	Inorganics, Edmonton, Alberta
Erin Sanchez		Metals, Burnaby, British Columbia
Juanita Martis	Laboratory Analyst	Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Inorganics, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Inorganics, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Leon Yang	Analyst	Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Paolo Obillo	Account Manager Assistant	Administration, Burnaby, British Columbia
Sam Silveira	Lab Assistant	Metals, Burnaby, British Columbia

No Breaches Found

General Comments

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

Where a reported less than (<) result is higher than the LOR, this may be due to primary sample extract/digestate dilution and/or insufficient sample for analysis.
Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.

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

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

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

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

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

>: greater than.
<: less than.
Red shading is applied where the result or the LOR is greater than the Guideline Upper Limit (or lower than the Guideline Lower Limit, if applicable).
For drinking water samples, Red shading is applied where the result for E.coli, fecal or total coliforms is greater than or equal to the Guideline Upper Limit.

Analytical Results Evaluation

Matrix: **Water**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	WLNG DS 1	WLNG US 1	----	----	----	----	----
				Sampling date/time	18-Dec-2023 11:40	18-Dec-2023 09:20	----	----	----	----	----
				Sub-Matrix	Water	Water	----	----	----	----	----
					VA23D0307-001	VA23D0307-002	--------	--------	--------	--------	--------
Field Tests											
Conductivity, field	----	EF001/VA	µS/cm		48.000	34.000	----	----	----	----	----
pH, field	----	EF001/VA	pH units		7.66	7.80	----	----	----	----	----
Temperature, field	----	EF001/VA	°C		7.90	7.10	----	----	----	----	----
Physical Tests											
Hardness (as CaCO3), dissolved	----	EC100/VA	mg/L		19.3	7.62	----	----	----	----	----
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/VA	mg/L		19.9	8.05	----	----	----	----	----
Solids, total dissolved [TDS]	----	E162/VA	mg/L		36	19	----	----	----	----	----
Solids, total suspended [TSS]	----	E160/VA	mg/L		<3.0	<3.0	----	----	----	----	----
Alkalinity, total (as CaCO3)	----	E290/VA	mg/L		17.9	5.7	----	----	----	----	----
Anions and Nutrients											
Ammonia, total (as N)	7664-41-7	E298/VA	mg/L		0.0074	<0.0050	----	----	----	----	----
Bromide	24959-67-9	E235.Br-L/VA	mg/L		<0.050	<0.050	----	----	----	----	----
Chloride	16887-00-6	E235.Cl/VA	mg/L		0.94	1.01	----	----	----	----	----
Fluoride	16984-48-8	E235.F/VA	mg/L		0.022	0.020	----	----	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318/VA	mg/L		0.064	0.076	----	----	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	mg/L		0.0838	0.0771	----	----	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	mg/L		<0.0010	<0.0010	----	----	----	----	----
Nitrogen, total	7727-37-9	E366/VA	mg/L		0.133	0.130	----	----	----	----	----
Phosphorus, total	7723-14-0	E372-U/VA	mg/L		0.0139	0.0206	----	----	----	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/VA	mg/L		3.71	3.50	----	----	----	----	----
Organic / Inorganic Carbon											
Carbon, dissolved organic [DOC]	----	E358-L/VA	mg/L		1.99	2.22	----	----	----	----	----
Total Sulfides											
Sulfide, total (as S)	18496-25-8	E395/VA	mg/L		<0.0015	<0.0015	----	----	----	----	----
Sulfide, un-ionized (as H2S), from total	7783-06-4	EC395/VA	mg/L		<0.0015	<0.0015	----	----	----	----	----
Sulfide, total (as H2S)	7783-06-4	E395/VA	mg/L		<0.0016	<0.0016	----	----	----	----	----
Total Metals											

Analytical Results Evaluation

Matrix: **Water**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	WLNG DS 1	WLNG US 1	----	----	----	----	----
				Sampling date/time	18-Dec-2023 11:40	18-Dec-2023 09:20	----	----	----	----	----
				Sub-Matrix	Water	Water	----	----	----	----	----
					VA23D0307-001	VA23D0307-002	--------	--------	--------	--------	--------
Total Metals											
Aluminum, total	7429-90-5	E420/VA	mg/L		0.0802	0.100	----	----	----	----	----
Antimony, total	7440-36-0	E420/VA	mg/L		<0.00010	<0.00010	----	----	----	----	----
Arsenic, total	7440-38-2	E420/VA	mg/L		0.00013	0.00017	----	----	----	----	----
Barium, total	7440-39-3	E420/VA	mg/L		0.00468	0.00277	----	----	----	----	----
Beryllium, total	7440-41-7	E420/VA	mg/L		<0.000100	<0.000100	----	----	----	----	----
Bismuth, total	7440-69-9	E420/VA	mg/L		<0.000050	<0.000050	----	----	----	----	----
Boron, total	7440-42-8	E420/VA	mg/L		<0.010	<0.010	----	----	----	----	----
Cadmium, total	7440-43-9	E420/VA	mg/L		0.0000062	0.0000056	----	----	----	----	----
Calcium, total	7440-70-2	E420/VA	mg/L		7.04	2.53	----	----	----	----	----
Cesium, total	7440-46-2	E420/VA	mg/L		<0.000010	<0.000010	----	----	----	----	----
Chromium, total	7440-47-3	E420/VA	mg/L		<0.00050	<0.00050	----	----	----	----	----
Cobalt, total	7440-48-4	E420/VA	mg/L		<0.00010	<0.00010	----	----	----	----	----
Copper, total	7440-50-8	E420/VA	mg/L		0.00075	0.00074	----	----	----	----	----
Iron, total	7439-89-6	E420/VA	mg/L		0.065	0.033	----	----	----	----	----
Lead, total	7439-92-1	E420/VA	mg/L		0.000050	<0.000050	----	----	----	----	----
Lithium, total	7439-93-2	E420/VA	mg/L		<0.0010	<0.0010	----	----	----	----	----
Magnesium, total	7439-95-4	E420/VA	mg/L		0.556	0.421	----	----	----	----	----
Manganese, total	7439-96-5	E420/VA	mg/L		0.00385	0.00135	----	----	----	----	----
Mercury, total	7439-97-6	E508/VA	mg/L		<0.0000050	<0.0000050	----	----	----	----	----
Molybdenum, total	7439-98-7	E420/VA	mg/L		0.000614	0.000394	----	----	----	----	----
Nickel, total	7440-02-0	E420/VA	mg/L		<0.00050	<0.00050	----	----	----	----	----
Phosphorus, total	7723-14-0	E420/VA	mg/L		<0.050	<0.050	----	----	----	----	----
Potassium, total	7440-09-7	E420/VA	mg/L		0.265	0.209	----	----	----	----	----
Rubidium, total	7440-17-7	E420/VA	mg/L		0.00040	<0.00020	----	----	----	----	----
Selenium, total	7782-49-2	E420/VA	mg/L		<0.000050	<0.000050	----	----	----	----	----
Silicon, total	7440-21-3	E420/VA	mg/L		3.90	3.78	----	----	----	----	----
Silver, total	7440-22-4	E420/VA	mg/L		<0.000010	<0.000010	----	----	----	----	----
Sodium, total	7440-23-5	E420/VA	mg/L		1.66	1.62	----	----	----	----	----
Strontium, total	7440-24-6	E420/VA	mg/L		0.0228	0.0109	----	----	----	----	----

Analytical Results Evaluation

Matrix: **Water**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	WLNG DS 1	WLNG US 1	----	----	----	----	----
				Sampling date/time	18-Dec-2023 11:40	18-Dec-2023 09:20	----	----	----	----	----
				Sub-Matrix	Water	Water	----	----	----	----	----
					VA23D0307-001	VA23D0307-002	--------	--------	--------	--------	--------
Total Metals											
Sulfur, total	7704-34-9	E420/VA	mg/L		1.17	1.10	----	----	----	----	----
Tellurium, total	13494-80-9	E420/VA	mg/L		<0.00020	<0.00020	----	----	----	----	----
Thallium, total	7440-28-0	E420/VA	mg/L		<0.000010	<0.000010	----	----	----	----	----
Thorium, total	7440-29-1	E420/VA	mg/L		<0.00010	<0.00010	----	----	----	----	----
Tin, total	7440-31-5	E420/VA	mg/L		<0.00010	<0.00010	----	----	----	----	----
Titanium, total	7440-32-6	E420/VA	mg/L		0.00079	0.00086	----	----	----	----	----
Tungsten, total	7440-33-7	E420/VA	mg/L		<0.00010	<0.00010	----	----	----	----	----
Uranium, total	7440-61-1	E420/VA	mg/L		0.000096	0.000104	----	----	----	----	----
Vanadium, total	7440-62-2	E420/VA	mg/L		<0.00050	<0.00050	----	----	----	----	----
Zinc, total	7440-66-6	E420/VA	mg/L		<0.0030	<0.0030	----	----	----	----	----
Zirconium, total	7440-67-7	E420/VA	mg/L		<0.00020	<0.00020	----	----	----	----	----
Dissolved Metals											
Aluminum, dissolved	7429-90-5	E421/VA	mg/L		0.0607	0.0770	----	----	----	----	----
Antimony, dissolved	7440-36-0	E421/VA	mg/L		<0.00010	<0.00010	----	----	----	----	----
Arsenic, dissolved	7440-38-2	E421/VA	mg/L		0.00011	0.00013	----	----	----	----	----
Barium, dissolved	7440-39-3	E421/VA	mg/L		0.00464	0.00253	----	----	----	----	----
Beryllium, dissolved	7440-41-7	E421/VA	mg/L		<0.000100	<0.000100	----	----	----	----	----
Bismuth, dissolved	7440-69-9	E421/VA	mg/L		<0.000050	<0.000050	----	----	----	----	----
Boron, dissolved	7440-42-8	E421/VA	mg/L		<0.010	<0.010	----	----	----	----	----
Cadmium, dissolved	7440-43-9	E421/VA	mg/L		0.0000052	<0.0000050	----	----	----	----	----
Calcium, dissolved	7440-70-2	E421/VA	mg/L		6.85	2.41	----	----	----	----	----
Cesium, dissolved	7440-46-2	E421/VA	mg/L		<0.000010	<0.000010	----	----	----	----	----
Chromium, dissolved	7440-47-3	E421/VA	mg/L		<0.00050	<0.00050	----	----	----	----	----
Cobalt, dissolved	7440-48-4	E421/VA	mg/L		<0.00010	<0.00010	----	----	----	----	----
Copper, dissolved	7440-50-8	E421/VA	mg/L		0.00066	0.00064	----	----	----	----	----
Iron, dissolved	7439-89-6	E421/VA	mg/L		0.023	0.020	----	----	----	----	----
Lead, dissolved	7439-92-1	E421/VA	mg/L		<0.000050	<0.000050	----	----	----	----	----
Lithium, dissolved	7439-93-2	E421/VA	mg/L		<0.0010	<0.0010	----	----	----	----	----

Analytical Results Evaluation

Matrix: **Water**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	WLNG DS 1	WLNG US 1	----	----	----	----	----
				Sampling date/time	18-Dec-2023 11:40	18-Dec-2023 09:20	----	----	----	----	----
				Sub-Matrix	Water	Water	----	----	----	----	----
					VA23D0307-001	VA23D0307-002	--------	--------	--------	--------	--------
Dissolved Metals											
Magnesium, dissolved	7439-95-4	E421/VA	mg/L		0.537	0.388	----	----	----	----	----
Manganese, dissolved	7439-96-5	E421/VA	mg/L		0.00269	0.00064	----	----	----	----	----
Mercury, dissolved	7439-97-6	E509/VA	mg/L		<0.0000050	<0.0000050	----	----	----	----	----
Molybdenum, dissolved	7439-98-7	E421/VA	mg/L		0.000597	0.000388	----	----	----	----	----
Nickel, dissolved	7440-02-0	E421/VA	mg/L		<0.00050	<0.00050	----	----	----	----	----
Phosphorus, dissolved	7723-14-0	E421/VA	mg/L		<0.050	<0.050	----	----	----	----	----
Potassium, dissolved	7440-09-7	E421/VA	mg/L		0.290	0.195	----	----	----	----	----
Rubidium, dissolved	7440-17-7	E421/VA	mg/L		0.00045	0.00022	----	----	----	----	----
Selenium, dissolved	7782-49-2	E421/VA	mg/L		<0.000050	<0.000050	----	----	----	----	----
Silicon, dissolved	7440-21-3	E421/VA	mg/L		3.91	3.74	----	----	----	----	----
Silver, dissolved	7440-22-4	E421/VA	mg/L		<0.000010	<0.000010	----	----	----	----	----
Sodium, dissolved	7440-23-5	E421/VA	mg/L		1.59	1.48	----	----	----	----	----
Strontium, dissolved	7440-24-6	E421/VA	mg/L		0.0235	0.0115	----	----	----	----	----
Sulfur, dissolved	7704-34-9	E421/VA	mg/L		1.28	1.16	----	----	----	----	----
Tellurium, dissolved	13494-80-9	E421/VA	mg/L		<0.00020	<0.00020	----	----	----	----	----
Thallium, dissolved	7440-28-0	E421/VA	mg/L		<0.000010	<0.000010	----	----	----	----	----
Thorium, dissolved	7440-29-1	E421/VA	mg/L		<0.00010	<0.00010	----	----	----	----	----
Tin, dissolved	7440-31-5	E421/VA	mg/L		<0.00010	<0.00010	----	----	----	----	----
Titanium, dissolved	7440-32-6	E421/VA	mg/L		<0.00030	<0.00030	----	----	----	----	----
Tungsten, dissolved	7440-33-7	E421/VA	mg/L		<0.00010	<0.00010	----	----	----	----	----
Uranium, dissolved	7440-61-1	E421/VA	mg/L		0.000097	0.000101	----	----	----	----	----
Vanadium, dissolved	7440-62-2	E421/VA	mg/L		<0.00050	<0.00050	----	----	----	----	----
Zinc, dissolved	7440-66-6	E421/VA	mg/L		0.0039	0.0014	----	----	----	----	----
Zirconium, dissolved	7440-67-7	E421/VA	mg/L		<0.00020	<0.00020	----	----	----	----	----
Dissolved mercury filtration location	----	EP509/VA	-		Field	Field	----	----	----	----	----
Dissolved metals filtration location	----	EP421/VA	-		Field	Field	----	----	----	----	----
Aggregate Organics											
Chemical oxygen demand [COD]	----	E559-L/VA	mg/L		<10	15	----	----	----	----	----

Analytical Results Evaluation

Matrix: **Water**

Analyte	CAS Number	Method/Lab	Unit	Client sample ID	WLNG DS 1	WLNG US 1	----	----	----	----	----
				Sampling date/time	18-Dec-2023 11:40	18-Dec-2023 09:20	----	----	----	----	----
				Sub-Matrix	Water	Water	----	----	----	----	----
				VA23D0307-001	VA23D0307-002	--------	--------	--------	--------	--------	
Aggregate Organics											
Phenols, total (4AAP)	----	E562/EO	mg/L	<0.0010	<0.0010	----	----	----	----	----	

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

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

Key:

CERTIFICATE OF ANALYSIS

Work Order	: **VA23D0307**	Page	: 1 of 6
Client	: **Triton Environmental Consultants Ltd.**	Laboratory	: ALS Environmental - Vancouver
Contact	:	Account Manager	
Address	: Suite 1730, 1111 West Georgia St Vancouver BC Canada V6E 4M3	Address	: 8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone		Telephone	
Project	: 11964	Date Samples Received	:
PO	: ----	Date Analysis Commenced	: 18-Dec-2023 17:20
C-O-C number	: ----	Issue Date	: 19-Dec-2023
Sampler	: ----		: 29-Dec-2023 12:00
Site	: Water Analysis		
Quote number	: VA23-TRIT100-012		
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*
Brooke Miller	Laboratory Analyst	Inorganics, Edmonton, Alberta
Erin Sanchez		Metals, Burnaby, British Columbia
Juanita Martis	Laboratory Analyst	Metals, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Inorganics, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Inorganics, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Leon Yang	Analyst	Inorganics, Burnaby, British Columbia
Miles Gropen	Department Manager - Inorganics	Inorganics, Burnaby, British Columbia
Paolo Obillo	Account Manager Assistant	Administration, Burnaby, British Columbia
Sam Silveira	Lab Assistant	Metals, Burnaby, British Columbia

General Comments

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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: WLNG DS 1	Client sample ID: WLNG US 1	Client sample ID: ----	Client sample ID: ----	Client sample ID: ----
Client sampling date / time					18-Dec-2023 11:40	18-Dec-2023 09:20	----	----	----
					VA23D0307-001	VA23D0307-002	--------	--------	--------
					Result	Result	----	----	----
Field Tests									
Conductivity, field	----	EF001/VA	0.10	µS/cm	48.000	34.000	----	----	----
pH, field	----	EF001/VA	0.10	pH units	7.66	7.80	----	----	----
Temperature, field	----	EF001/VA	0.10	°C	7.90	7.10	----	----	----
Physical Tests									
Hardness (as CaCO3), dissolved	----	EC100/VA	0.60	mg/L	19.3	7.62	----	----	----
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/VA	0.60	mg/L	19.9	8.05	----	----	----
Solids, total dissolved [TDS]	----	E162/VA	10	mg/L	36	19	----	----	----
Solids, total suspended [TSS]	----	E160/VA	3.0	mg/L	<3.0	<3.0	----	----	----
Alkalinity, total (as CaCO3)	----	E290/VA	2.0	mg/L	17.9	5.7	----	----	----
Anions and Nutrients									
Ammonia, total (as N)	7664-41-7	E298/VA	0.0050	mg/L	0.0074	<0.0050	----	----	----
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	0.94	1.01	----	----	----
Fluoride	16984-48-8	E235.F/VA	0.020	mg/L	0.022	0.020	----	----	----
Kjeldahl nitrogen, total [TKN]	----	E318/VA	0.050	mg/L	0.064	0.076	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	0.0050	mg/L	0.0838	0.0771	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	0.0010	mg/L	<0.0010	<0.0010	----	----	----
Nitrogen, total	7727-37-9	E366/VA	0.030	mg/L	0.133	0.130	----	----	----
Phosphorus, total	7723-14-0	E372-U/VA	0.0020	mg/L	0.0139	0.0206	----	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/VA	0.30	mg/L	3.71	3.50	----	----	----
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L/VA	0.50	mg/L	1.99	2.22	----	----	----
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	0.0802	0.100	----	----	----

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	WLNG DS 1	WLNG US 1	----	----	----
					Client sampling date / time	18-Dec-2023 11:40	18-Dec-2023 09:20	----	----	----
						VA23D0307-001	VA23D0307-002	--------	--------	--------
						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		0.00013	0.00017	----	----	----
Barium, total	7440-39-3	E420/VA	0.00010	mg/L		0.00468	0.00277	----	----	----
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		0.0000062	0.0000056	----	----	----
Calcium, total	7440-70-2	E420/VA	0.050	mg/L		7.04	2.53	----	----	----
Cesium, total	7440-46-2	E420/VA	0.000010	mg/L		<0.000010	<0.000010	----	----	----
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		0.00075	0.00074	----	----	----
Iron, total	7439-89-6	E420/VA	0.010	mg/L		0.065	0.033	----	----	----
Lead, total	7439-92-1	E420/VA	0.000050	mg/L		0.000050	<0.000050	----	----	----
Lithium, total	7439-93-2	E420/VA	0.0010	mg/L		<0.0010	<0.0010	----	----	----
Magnesium, total	7439-95-4	E420/VA	0.0050	mg/L		0.556	0.421	----	----	----
Manganese, total	7439-96-5	E420/VA	0.00010	mg/L		0.00385	0.00135	----	----	----
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		0.000614	0.000394	----	----	----
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		0.265	0.209	----	----	----
Rubidium, total	7440-17-7	E420/VA	0.00020	mg/L		0.00040	<0.00020	----	----	----
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		3.90	3.78	----	----	----
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		1.66	1.62	----	----	----
Strontium, total	7440-24-6	E420/VA	0.00020	mg/L		0.0228	0.0109	----	----	----
Sulfur, total	7704-34-9	E420/VA	0.50	mg/L		1.17	1.10	----	----	----
Tellurium, total	13494-80-9	E420/VA	0.00020	mg/L		<0.00020	<0.00020	----	----	----

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	WLNG DS 1	WLNG US 1	----	----	----
					Client sampling date / time	18-Dec-2023 11:40	18-Dec-2023 09:20	----	----	----
						VA23D0307-001	VA23D0307-002	--------	--------	--------
						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		0.00079	0.00086	----	----	----
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		0.000096	0.000104	----	----	----
Vanadium, total	7440-62-2	E420/VA	0.00050	mg/L		<0.00050	<0.00050	----	----	----
Zinc, total	7440-66-6	E420/VA	0.0030	mg/L		<0.0030	<0.0030	----	----	----
Zirconium, total	7440-67-7	E420/VA	0.00020	mg/L		<0.00020	<0.00020	----	----	----
Dissolved Metals										
Aluminum, dissolved	7429-90-5	E421/VA	0.0010	mg/L		0.0607	0.0770	----	----	----
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	0.00013	----	----	----
Barium, dissolved	7440-39-3	E421/VA	0.00010	mg/L		0.00464	0.00253	----	----	----
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		0.0000052	<0.0000050	----	----	----
Calcium, dissolved	7440-70-2	E421/VA	0.050	mg/L		6.85	2.41	----	----	----
Cesium, dissolved	7440-46-2	E421/VA	0.000010	mg/L		<0.000010	<0.000010	----	----	----
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		0.00066	0.00064	----	----	----
Iron, dissolved	7439-89-6	E421/VA	0.010	mg/L		0.023	0.020	----	----	----
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		0.537	0.388	----	----	----
Manganese, dissolved	7439-96-5	E421/VA	0.00010	mg/L		0.00269	0.00064	----	----	----
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		0.000597	0.000388	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	WLNG DS 1	WLNG US 1	----	----	----
					Client sampling date / time	18-Dec-2023 11:40	18-Dec-2023 09:20	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		VA23D0307-001	VA23D0307-002	--------	--------	--------
						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		0.290	0.195	----	----	----
Rubidium, dissolved	7440-17-7	E421/VA	0.00020	mg/L		0.00045	0.00022	----	----	----
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		3.91	3.74	----	----	----
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		1.59	1.48	----	----	----
Strontium, dissolved	7440-24-6	E421/VA	0.00020	mg/L		0.0235	0.0115	----	----	----
Sulfur, dissolved	7704-34-9	E421/VA	0.50	mg/L		1.28	1.16	----	----	----
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		<0.00030	<0.00030	----	----	----
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		0.000097	0.000101	----	----	----
Vanadium, dissolved	7440-62-2	E421/VA	0.00050	mg/L		<0.00050	<0.00050	----	----	----
Zinc, dissolved	7440-66-6	E421/VA	0.0010	mg/L		0.0039	0.0014	----	----	----
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	----	----	----
Aggregate Organics										
Chemical oxygen demand [COD]	----	E559-L/VA	10	mg/L		<10	15	----	----	----
Phenols, total (4AAP)	----	E562/EO	0.0010	mg/L		<0.0010	<0.0010	----	----	----

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.

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QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **VA23D0307**	Page	: 1 of 15
Client	: **Triton Environmental Consultants Ltd.**	Laboratory	: ALS Environmental - Vancouver
Contact	:	Account Manager	
Address	: Suite 1730, 1111 West Georgia St Vancouver BC Canada V6E 4M3	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone		Telephone	: 18-Dec-2023 17:20
Project	----	Date Samples Received	: 29-Dec-2023 12:01
PO	: ----	Issue Date	
C-O-C number	: ----		
Sampler	: Water Analysis		
Site	: VA23-TRIT100-012		
Quote number	: 2		
No. of samples received			
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)

- No Analysis Holding Time Outliers exist.

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
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) WLNG DS 1	E559-L	18-Dec-2023	----	----	----		22-Dec-2023	28 days	4 days	✓
Aggregate Organics : Chemical Oxygen Demand by Colourimetry (Low Level)										
Amber glass total (sulfuric acid) WLNG US 1	E559-L	18-Dec-2023	----	----	----		22-Dec-2023	28 days	4 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) WLNG DS 1	E562	18-Dec-2023	22-Dec-2023	28 days	4 days	✓	22-Dec-2023	28 days	4 days	✓
Aggregate Organics : Phenols (4AAP) in Water by Colorimetry										
Amber glass total (sulfuric acid) WLNG US 1	E562	18-Dec-2023	22-Dec-2023	28 days	4 days	✓	22-Dec-2023	28 days	4 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) WLNG DS 1	E298	18-Dec-2023	27-Dec-2023	28 days	9 days	✓	28-Dec-2023	28 days	10 days	✓
Anions and Nutrients : Ammonia by Fluorescence										
Amber glass total (sulfuric acid) WLNG US 1	E298	18-Dec-2023	27-Dec-2023	28 days	9 days	✓	28-Dec-2023	28 days	10 days	✓
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE WLNG DS 1	E235.Br-L	18-Dec-2023	20-Dec-2023	28 days	2 days	✓	20-Dec-2023	28 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times		Eval	Analysis Date	Holding Times		Eval
				Rec	Actual			Rec	Actual	
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE										
WLNG US 1	E235.Br-L	18-Dec-2023	20-Dec-2023	28 days	2 days	✓	20-Dec-2023	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
WLNG DS 1	E235.Cl	18-Dec-2023	20-Dec-2023	28 days	2 days	✓	20-Dec-2023	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE										
WLNG US 1	E235.Cl	18-Dec-2023	20-Dec-2023	28 days	2 days	✓	20-Dec-2023	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
WLNG DS 1	E235.F	18-Dec-2023	20-Dec-2023	28 days	2 days	✓	20-Dec-2023	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE										
WLNG US 1	E235.F	18-Dec-2023	20-Dec-2023	28 days	2 days	✓	20-Dec-2023	28 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE										
WLNG DS 1	E235.NO3-L	18-Dec-2023	20-Dec-2023	3 days	2 days	✓	20-Dec-2023	3 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE										
WLNG US 1	E235.NO3-L	18-Dec-2023	20-Dec-2023	3 days	2 days	✓	20-Dec-2023	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
WLNG DS 1	E235.NO2-L	18-Dec-2023	20-Dec-2023	3 days	2 days	✓	20-Dec-2023	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE										
WLNG US 1	E235.NO2-L	18-Dec-2023	20-Dec-2023	3 days	2 days	✓	20-Dec-2023	3 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 : Sulfate in Water by IC										
HDPE										
WLNG DS 1	E235.SO4	18-Dec-2023	20-Dec-2023	28 days	2 days	✓	20-Dec-2023	28 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE										
WLNG US 1	E235.SO4	18-Dec-2023	20-Dec-2023	28 days	2 days	✓	20-Dec-2023	28 days	2 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
WLNG DS 1	E318	18-Dec-2023	27-Dec-2023	28 days	9 days	✓	28-Dec-2023	28 days	10 days	✓
Anions and Nutrients : Total Kjeldahl Nitrogen by Fluorescence (Low Level)										
Amber glass total (sulfuric acid)										
WLNG US 1	E318	18-Dec-2023	27-Dec-2023	28 days	9 days	✓	28-Dec-2023	28 days	10 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid)										
WLNG DS 1	E366	18-Dec-2023	27-Dec-2023	28 days	9 days	✓	27-Dec-2023	28 days	9 days	✓
Anions and Nutrients : Total Nitrogen by Colourimetry										
Amber glass total (sulfuric acid)										
WLNG US 1	E366	18-Dec-2023	27-Dec-2023	28 days	9 days	✓	27-Dec-2023	28 days	9 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
WLNG DS 1	E372-U	18-Dec-2023	27-Dec-2023	28 days	9 days	✓	28-Dec-2023	28 days	10 days	✓
Anions and Nutrients : Total Phosphorus by Colourimetry (0.002 mg/L)										
Amber glass total (sulfuric acid)										
WLNG US 1	E372-U	18-Dec-2023	27-Dec-2023	28 days	9 days	✓	28-Dec-2023	28 days	10 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial - dissolved (lab preserved)										
WLNG DS 1	E509	18-Dec-2023	20-Dec-2023	28 days	2 days	✓	20-Dec-2023	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
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial - dissolved (lab preserved)										
WLNG US 1	E509	18-Dec-2023	20-Dec-2023	28 days	2 days	✓	20-Dec-2023	28 days	0 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved)										
WLNG DS 1	E421	18-Dec-2023	20-Dec-2023	180 days	2 days	✓	20-Dec-2023	180 days	2 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE - dissolved (lab preserved)										
WLNG US 1	E421	18-Dec-2023	20-Dec-2023	180 days	2 days	✓	20-Dec-2023	180 days	2 days	✓
Field Tests : Field pH,EC,Salinity,Cl2,ClO2,ORP,DO, Turbidity,T,T-P,o-PO4,NH3,Chloramine										
Glass vial - total (lab preserved)										
WLNG DS 1	EF001	18-Dec-2023	----	----	----		19-Dec-2023	----	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)										
WLNG US 1	EF001	18-Dec-2023	----	----	----		19-Dec-2023	----	1 days	
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
WLNG DS 1	E358-L	18-Dec-2023	27-Dec-2023	28 days	9 days	✓	27-Dec-2023	28 days	9 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
WLNG US 1	E358-L	18-Dec-2023	27-Dec-2023	28 days	9 days	✓	27-Dec-2023	28 days	9 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
WLNG DS 1	E290	18-Dec-2023	20-Dec-2023	14 days	2 days	✓	20-Dec-2023	14 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
WLNG US 1	E290	18-Dec-2023	20-Dec-2023	14 days	2 days	✓	20-Dec-2023	14 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
Physical Tests : TDS by Gravimetry										
HDPE										
WLNG DS 1	E162	18-Dec-2023	----	----	----		21-Dec-2023	7 days	4 days	✓
Physical Tests : TDS by Gravimetry										
HDPE										
WLNG US 1	E162	18-Dec-2023	----	----	----		21-Dec-2023	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE										
WLNG DS 1	E160	18-Dec-2023	----	----	----		21-Dec-2023	7 days	4 days	✓
Physical Tests : TSS by Gravimetry										
HDPE										
WLNG US 1	E160	18-Dec-2023	----	----	----		21-Dec-2023	7 days	4 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial - total (lab preserved)										
WLNG DS 1	E508	18-Dec-2023	20-Dec-2023	28 days	2 days	✓	20-Dec-2023	28 days	0 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial - total (lab preserved)										
WLNG US 1	E508	18-Dec-2023	20-Dec-2023	28 days	2 days	✓	20-Dec-2023	28 days	0 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
WLNG DS 1	E420	18-Dec-2023	20-Dec-2023	180 days	2 days	✓	20-Dec-2023	180 days	2 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved)										
WLNG US 1	E420	18-Dec-2023	20-Dec-2023	180 days	2 days	✓	20-Dec-2023	180 days	2 days	✓
Total Sulfides : Total Sulfide by Colourimetry (Automated Flow)										
HDPE total (zinc acetate+sodium hydroxide)										
WLNG DS 1	E395	18-Dec-2023	----	----	----		20-Dec-2023	7 days	2 days	✓

Matrix: **Water**

Evaluation: × = Holding time exceedance ; ✓ = Within Holding Time

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Total Sulfides : Total Sulfide by Colourimetry (Automated Flow)										
HDPE total (zinc acetate+sodium hydroxide)										
WLNG US 1	E395	18-Dec-2023	----	----	----		20-Dec-2023	7 days	2 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	1284065	1	11	9.0	5.0	✓
Ammonia by Fluorescence	E298	1288488	1	15	6.6	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	1284071	1	12	8.3	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	1287194	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	1284070	1	16	6.2	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1284768	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1282398	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1288489	1	12	8.3	5.0	✓
Fluoride in Water by IC	E235.F	1284069	1	15	6.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1284072	1	16	6.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1284073	1	18	5.5	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1286734	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	1284074	1	13	7.6	5.0	✓
TDS by Gravimetry	E162	1286414	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1288485	1	5	20.0	5.0	✓
Total Mercury in Water by CVAAS	E508	1284645	1	16	6.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1281719	1	19	5.2	5.0	✓
Total Nitrogen by Colourimetry	E366	1288486	1	12	8.3	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1288487	1	16	6.2	5.0	✓
Total Sulfide by Colourimetry (Automated Flow)	E395	1284118	1	16	6.2	5.0	✓
TSS by Gravimetry	E160	1286419	1	20	5.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	1284065	1	11	9.0	5.0	✓
Ammonia by Fluorescence	E298	1288488	1	15	6.6	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	1284071	1	12	8.3	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	1287194	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	1284070	1	16	6.2	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1284768	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1282398	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1288489	1	12	8.3	5.0	✓
Fluoride in Water by IC	E235.F	1284069	1	15	6.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1284072	1	16	6.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1284073	1	18	5.5	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1286734	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	1284074	1	13	7.6	5.0	✓
TDS by Gravimetry	E162	1286414	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*
Laboratory Control Samples (LCS) - Continued							
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1288485	1	5	20.0	5.0	✓
Total Mercury in Water by CVAAS	E508	1284645	1	16	6.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1281719	1	19	5.2	5.0	✓
Total Nitrogen by Colourimetry	E366	1288486	1	12	8.3	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1288487	1	16	6.2	5.0	✓
Total Sulfide by Colourimetry (Automated Flow)	E395	1284118	1	16	6.2	5.0	✓
TSS by Gravimetry	E160	1286419	1	20	5.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	1284065	1	11	9.0	5.0	✓
Ammonia by Fluorescence	E298	1288488	1	15	6.6	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	1284071	1	12	8.3	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	1287194	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	1284070	1	16	6.2	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1284768	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1282398	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1288489	1	12	8.3	5.0	✓
Fluoride in Water by IC	E235.F	1284069	1	15	6.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1284072	1	16	6.2	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1284073	1	18	5.5	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1286734	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	1284074	1	13	7.6	5.0	✓
TDS by Gravimetry	E162	1286414	1	20	5.0	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1288485	1	5	20.0	5.0	✓
Total Mercury in Water by CVAAS	E508	1284645	1	16	6.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1281719	1	19	5.2	5.0	✓
Total Nitrogen by Colourimetry	E366	1288486	1	12	8.3	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1288487	1	16	6.2	5.0	✓
Total Sulfide by Colourimetry (Automated Flow)	E395	1284118	1	16	6.2	5.0	✓
TSS by Gravimetry	E160	1286419	1	20	5.0	5.0	✓
Matrix Spikes (MS)							
Ammonia by Fluorescence	E298	1288488	1	15	6.6	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	1284071	1	12	8.3	5.0	✓
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L	1287194	1	20	5.0	5.0	✓
Chloride in Water by IC	E235.Cl	1284070	1	16	6.2	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1284768	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1282398	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1288489	1	12	8.3	5.0	✓
Fluoride in Water by IC	E235.F	1284069	1	15	6.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1284072	1	16	6.2	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*
Matrix Spikes (MS) - Continued							
Nitrite in Water by IC (Low Level)	E235.NO2-L	1284073	1	18	5.5	5.0	✓
Phenols (4AAP) in Water by Colorimetry	E562	1286734	1	19	5.2	5.0	✓
Sulfate in Water by IC	E235.SO4	1284074	1	13	7.6	5.0	✓
Total Kjeldahl Nitrogen by Fluorescence (Low Level)	E318	1288485	1	5	20.0	5.0	✓
Total Mercury in Water by CVAAS	E508	1284645	1	16	6.2	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1281719	1	19	5.2	5.0	✓
Total Nitrogen by Colourimetry	E366	1288486	1	12	8.3	5.0	✓
Total Phosphorus by Colourimetry (0.002 mg/L)	E372-U	1288487	1	16	6.2	5.0	✓
Total Sulfide by Colourimetry (Automated Flow)	E395	1284118	1	16	6.2	5.0	✓

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
TSS by Gravimetry	E160 ALS Environmental - Vancouver	Water	APHA 2540 D (mod)	Total Suspended Solids (TSS) are determined by filtering a sample through a glass fibre filter, following by drying of the filter at 104 ± 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 Kjeldahl Nitrogen by Fluorescence (Low Level)	E318 ALS Environmental - Vancouver	Water	Method Fialab 100, 2018	TKN 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).
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 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 H2S" if reported represent the maximum possible H2S concentration based on the total sulfide concentration in the sample. The H2S calculation converts Total Sulphide as (S2-) and reports it as Total Sulphide as (H2S)
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.
Chemical Oxygen Demand by Colourimetry (Low Level)	E559-L ALS Environmental - Vancouver	Water	APHA 5220 D (mod)	Samples are analyzed using the closed reflux colourimetric method.
Phenols (4AAP) in Water by Colorimetry	E562 ALS Environmental - Edmonton	Water	EPA 9066	This automated method is based on the distillation of phenol and subsequent reaction of the distillate with alkaline ferricyanide ($K_3Fe(CN)_6$) and 4-amino-antipyrine (4-AAP) to form a red complex which is measured colorimetrically.
Dissolved Hardness (Calculated)	EC100 ALS Environmental - Vancouver	Water	APHA 2340B	"Hardness (as $CaCO_3$), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in $CaCO_3$ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Hardness (Calculated) from Total Ca/Mg	EC100A ALS Environmental - Vancouver	Water	APHA 2340B	"Hardness (as $CaCO_3$), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in $CaCO_3$ equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
Un-ionized Total Hydrogen Sulfide (calculated)	EC395 ALS Environmental - Vancouver	Water	APHA 4500 -S H	Un-ionized sulfide is calculated using results from total sulfide analysis, pH, temperature, and ionic strength of the sample. Calculation of un-ionized sulfide using total sulfide concentrations may be biased high due to particulate forms of sulfide measured during total sulfide testing.
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.
Digestion for TKN in water	EP318 ALS Environmental - Vancouver	Water	APHA 4500-Norg D (mod)	Samples are digested at high temperature using Sulfuric Acid with Copper catalyst, which converts organic nitrogen sources to Ammonia, which is then quantified by the analytical method as TKN. This method is unsuitable for samples containing high levels of nitrate. If nitrate exceeds TKN concentration by ten times or more, results may be biased low.

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

QUALITY CONTROL REPORT

Work Order	: **VA23D0307**	Page	: 1 of 18
Client	: Triton Environmental Consultants Ltd.	Laboratory	: ALS Environmental - Vancouver
Contact	: Suite 1730, 1111 West Georgia St	Account Manager	: Can Dang
Address	Vancouver BC Canada V6E 4M3	Address	: 8081 Lougheed Highway Burnaby, British Columbia Canada V5A 1W9
Telephone	:	Telephone	
Project	: 11964	Date Samples Received	19-Dec-2023
PO	: ----	Date Analysis Commenced	: 29-Dec-2023 12:01
C-O-C number	: ----	Issue Date	
Sampler	: ----		
Site	: Water Analysis		
Quote number	: VA23-TRIT100-012		
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*
Brooke Miller	Laboratory Analyst	Edmonton Inorganics, Edmonton, Alberta
Erin Sanchez		Vancouver Metals, Burnaby, British Columbia
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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: 1284065)											
VA23D0362-002	Anonymous	Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	195	195	0.308%	20%	----
Physical Tests (QC Lot: 1286414)											
FJ2303323-003	Anonymous	Solids, total dissolved [TDS]	----	E162	20	mg/L	2940	2910	0.992%	20%	----
Physical Tests (QC Lot: 1286419)											
FJ2303323-003	Anonymous	Solids, total suspended [TSS]	----	E160	3.0	mg/L	<3.0	<3.0	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1284069)											
VA23D0307-001	WLNG DS 1	Fluoride	16984-48-8	E235.F	0.020	mg/L	0.022	0.021	0.001	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1284070)											
VA23D0307-001	WLNG DS 1	Chloride	16887-00-6	E235.Cl	0.50	mg/L	0.94	0.94	0.0008	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1284071)											
VA23D0307-001	WLNG 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: 1284072)											
VA23D0307-001	WLNG DS 1	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0050	mg/L	0.0838	0.0843	0.675%	20%	----
Anions and Nutrients (QC Lot: 1284073)											
VA23D0307-001	WLNG DS 1	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1284074)											
VA23D0307-001	WLNG DS 1	Sulfate (as SO4)	14808-79-8	E235.SO4	0.30	mg/L	3.71	3.70	0.140%	20%	----
Anions and Nutrients (QC Lot: 1288485)											
VA23D0307-001	WLNG DS 1	Kjeldahl nitrogen, total [TKN]	----	E318	0.050	mg/L	0.064	0.067	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1288486)											
VA23D0307-001	WLNG DS 1	Nitrogen, total	7727-37-9	E366	0.030	mg/L	0.133	0.134	0.0009	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1288487)											
VA23D0307-001	WLNG DS 1	Phosphorus, total	7723-14-0	E372-U	0.0020	mg/L	0.0139	0.0140	0.00008	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1288488)											
VA23D0307-001	WLNG DS 1	Ammonia, total (as N)	7664-41-7	E298	0.0050	mg/L	0.0074	0.0074	0.00002	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 1288489)											
VA23D0307-001	WLNG DS 1	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	1.99	1.91	0.09	Diff <2x LOR	----
Total Sulfides (QC Lot: 1284118)											
CG2317731-001	Anonymous	Sulfide, total (as S)	18496-25-8	E395	0.375	mg/L	6.12	7.05	14.2%	20%	----
Total Metals (QC Lot: 1281719)											

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: 1281719) - continued											
VA23D0287-001	Anonymous	Aluminum, total	7429-90-5	E420	0.0030	mg/L	0.308	0.303	1.79%	20%	----
		Antimony, total	7440-36-0	E420	0.00010	mg/L	0.00010	0.00010	0.000002	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00029	0.00032	0.00003	Diff <2x LOR	----
		Barium, total	7440-39-3	E420	0.00010	mg/L	0.0170	0.0172	1.32%	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	<0.010	<0.010	0	Diff <2x LOR	----
		Cadmium, total	7440-43-9	E420	0.0000050	mg/L	0.0000186	0.0000143	0.0000044	Diff <2x LOR	----
		Calcium, total	7440-70-2	E420	0.050	mg/L	3.18	3.11	2.32%	20%	----
		Cesium, total	7440-46-2	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Chromium, total	7440-47-3	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, total	7440-48-4	E420	0.00010	mg/L	0.00020	0.00020	0.0000005	Diff <2x LOR	----
		Copper, total	7440-50-8	E420	0.00050	mg/L	0.00092	0.00090	0.00002	Diff <2x LOR	----
		Iron, total	7439-89-6	E420	0.010	mg/L	0.250	0.240	3.97%	20%	----
		Lead, total	7439-92-1	E420	0.000050	mg/L	0.000431	0.000453	0.000022	Diff <2x LOR	----
		Lithium, total	7439-93-2	E420	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
		Magnesium, total	7439-95-4	E420	0.0050	mg/L	0.972	0.977	0.504%	20%	----
		Manganese, total	7439-96-5	E420	0.00010	mg/L	0.0218	0.0216	1.18%	20%	----
		Molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000072	0.000070	0.000001	Diff <2x LOR	----
		Nickel, total	7440-02-0	E420	0.00050	mg/L	0.00066	0.00067	0.00001	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	0.050	mg/L	0.527	0.529	0.524%	20%	----
		Rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00066	0.00066	0.000001	Diff <2x LOR	----
		Selenium, total	7782-49-2	E420	0.000050	mg/L	0.000050	0.000061	0.000011	Diff <2x LOR	----
		Silicon, total	7440-21-3	E420	0.10	mg/L	6.75	6.72	0.474%	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	5.32	5.38	1.21%	20%	----
		Strontium, total	7440-24-6	E420	0.00020	mg/L	0.0357	0.0366	2.54%	20%	----
		Sulfur, total	7704-34-9	E420	0.50	mg/L	1.53	1.41	0.12	Diff <2x LOR	----
		Tellurium, total	13494-80-9	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Thallium, total	7440-28-0	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Thorium, total	7440-29-1	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Tin, total	7440-31-5	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	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: 1281719) - continued											
VA23D0287-001	Anonymous	Uranium, total	7440-61-1	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Vanadium, total	7440-62-2	E420	0.00050	mg/L	0.00090	0.00091	0.000004	Diff <2x LOR	----
		Zinc, total	7440-66-6	E420	0.0030	mg/L	0.0047	0.0045	0.0002	Diff <2x LOR	----
		Zirconium, total	7440-67-7	E420	0.00020	mg/L	<0.00020	0.00021	0.000010	Diff <2x LOR	----
Total Metals (QC Lot: 1284645)											
KS2304857-001	Anonymous	Mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 1282398)											
VA23D0323-001	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0242	0.0254	4.51%	20%	----
		Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00076	0.00076	0.000003	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00044	0.00048	0.00004	Diff <2x LOR	----
		Barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.0257	0.0260	1.26%	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	<0.010	<0.010	0	Diff <2x LOR	----
		Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000225	0.0000187	0.0000038	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.050	mg/L	20.0	20.1	0.468%	20%	----
		Cesium, dissolved	7440-46-2	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Chromium, dissolved	7440-47-3	E421	0.00050	mg/L	0.00057	0.00058	0.00002	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	0.00022	0.00022	0.000005	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.010	mg/L	0.015	0.016	0.0005	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	<0.0010	<0.0010	0	Diff <2x LOR	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	2.44	2.51	3.02%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.00115	0.00116	0.921%	20%	----
		Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00151	0.00156	3.62%	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	0.581	0.596	2.46%	20%	----
		Rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00043	0.00040	0.00003	Diff <2x LOR	----
		Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000603	0.000677	11.7%	20%	----
		Silicon, dissolved	7440-21-3	E421	0.050	mg/L	0.882	0.922	4.44%	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	0.760	0.774	1.81%	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: 1282398) - continued											
VA23D0323-001	Anonymous	Strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.132	0.133	0.725%	20%	----
		Sulfur, dissolved	7704-34-9	E421	0.50	mg/L	7.72	8.01	3.75%	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	0.000004	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	0.000086	0.000094	0.000007	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	0.0016	0.0018	0.0002	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: 1284768)											
VA23D0256-001	Anonymous	Mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	0.0000054	<0.0000050	0.0000004	Diff <2x LOR	----
Aggregate Organics (QC Lot: 1286734)											
CG2317850-001	Anonymous	Phenols, total (4AAP)	----	E562	0.0010	mg/L	<0.0010	<0.0010	0	Diff <2x LOR	----
Aggregate Organics (QC Lot: 1287194)											
FJ2303321-001	Anonymous	Chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	<10	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: 1284065)						
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 1286414)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 1286419)						
Solids, total suspended [TSS]	----	E160	3	mg/L	<3.0	----
Anions and Nutrients (QCLot: 1284069)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1284070)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 1284071)						
Bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 1284072)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1284073)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 1284074)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 1288485)						
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 1288486)						
Nitrogen, total	7727-37-9	E366	0.03	mg/L	<0.030	----
Anions and Nutrients (QCLot: 1288487)						
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	<0.0020	----
Anions and Nutrients (QCLot: 1288488)						
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	<0.0050	----
Organic / Inorganic Carbon (QCLot: 1288489)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Total Sulfides (QCLot: 1284118)						
Sulfide, total (as S)	18496-25-8	E395	0.0015	mg/L	<0.0015	----
Total Metals (QCLot: 1281719)						
Aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 1281719) - continued						
Arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
Barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
Boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
Calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
Copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
Iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
Lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
Lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
Potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
Silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
Silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
Sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	<0.00010	----
Tin, total	7440-31-5	E420	0.0001	mg/L	<0.00010	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	<0.00030	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	<0.00010	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	<0.000010	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	<0.00050	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 1281719) - 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: 1284645)						
Mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 1282398)						
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: 1282398) - 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: 1284768)						
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Aggregate Organics (QCLot: 1286734)						
Phenols, total (4AAP)	----	E562	0.001	mg/L	<0.0010	----
Aggregate Organics (QCLot: 1287194)						
Chemical oxygen demand [COD]	----	E559-L	10	mg/L	<10	----

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: 1284065)									
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	111	85.0	115	----
Physical Tests (QCLot: 1286414)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	105	85.0	115	----
Physical Tests (QCLot: 1286419)									
Solids, total suspended [TSS]	----	E160	3	mg/L	150 mg/L	93.8	85.0	115	----
Anions and Nutrients (QCLot: 1284069)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 1284070)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 1284071)									
Bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	101	85.0	115	----
Anions and Nutrients (QCLot: 1284072)									
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: 1284073)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 1284074)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	103	90.0	110	----
Anions and Nutrients (QCLot: 1288485)									
Kjeldahl nitrogen, total [TKN]	----	E318	0.05	mg/L	4 mg/L	93.2	75.0	125	----
Anions and Nutrients (QCLot: 1288486)									
Nitrogen, total	7727-37-9	E366	0.03	mg/L	0.5 mg/L	98.3	75.0	125	----
Anions and Nutrients (QCLot: 1288487)									
Phosphorus, total	7723-14-0	E372-U	0.002	mg/L	0.05 mg/L	89.2	80.0	120	----
Anions and Nutrients (QCLot: 1288488)									
Ammonia, total (as N)	7664-41-7	E298	0.005	mg/L	0.2 mg/L	113	85.0	115	----
Organic / Inorganic Carbon (QCLot: 1288489)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	97.8	80.0	120	----
Total Sulfides (QCLot: 1284118)									
Sulfide, total (as S)	18496-25-8	E395	0.0015	mg/L	0.08 mg/L	108	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: 1281719)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	102	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	106	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	106	80.0	120	----
Barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	101	80.0	120	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	100	80.0	120	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	100	80.0	120	----
Boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	110	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	99.5	80.0	120	----
Calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	101	80.0	120	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	102	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	101	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	103	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	100	80.0	120	----
Iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	101	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	97.6	80.0	120	----
Lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	98.9	80.0	120	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	106	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	101	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	102	80.0	120	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	109	80.0	120	----
Potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	106	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	101	80.0	120	----
Silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	104	80.0	120	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	98.3	80.0	120	----
Sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	105	80.0	120	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	99.4	80.0	120	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	89.4	80.0	120	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	100	80.0	120	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	97.3	80.0	120	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	90.4	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	100.0	80.0	120	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	99.2	80.0	120	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	102	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: 1281719) - continued									
Uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	93.6	80.0	120	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	103	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	98.4	80.0	120	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	98.2	80.0	120	----
Total Metals (QCLot: 1284645)									
Mercury, total	7439-97-6	E508	0.000005	mg/L	0.0001 mg/L	108	80.0	120	----
Dissolved Metals (QCLot: 1282398)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	104	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	104	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	106	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	103	80.0	120	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	101	80.0	120	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	102	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	96.9	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	101	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	101	80.0	120	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	106	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	105	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	103	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	99.5	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	120	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	104	80.0	120	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	104	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	103	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	104	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	103	80.0	120	----
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	108	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	107	80.0	120	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	103	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	103	80.0	120	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	103	80.0	120	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	100	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	103	80.0	120	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	106	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: 1282398) - continued									
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	102	80.0	120	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	97.7	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	104	80.0	120	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	99.8	80.0	120	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	105	80.0	120	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	97.4	80.0	120	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	103	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	105	80.0	120	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	106	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	100	80.0	120	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	107	80.0	120	----
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0.0001 mg/L	103	80.0	120	----
Aggregate Organics (QCLot: 1286734)									
Phenols, total (4AAP)	----	E562	0.001	mg/L	0.02 mg/L	100	85.0	115	----
Aggregate Organics (QCLot: 1287194)									
Chemical oxygen demand [COD]	----	E559-L	10	mg/L	100 mg/L	110	85.0	115	----

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: 1284069)										
VA23D0307-002	WLNG US 1	Fluoride	16984-48-8	E235.F	1.02 mg/L	1 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 1284070)										
VA23D0307-002	WLNG US 1	Chloride	16887-00-6	E235.Cl	102 mg/L	100 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 1284071)										
VA23D0307-002	WLNG US 1	Bromide	24959-67-9	E235.Br-L	0.507 mg/L	0.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 1284072)										
VA23D0307-002	WLNG US 1	Nitrate (as N)	14797-55-8	E235.NO3-L	2.54 mg/L	2.5 mg/L	102	75.0	125	----
Anions and Nutrients (QCLot: 1284073)										
VA23D0307-002	WLNG US 1	Nitrite (as N)	14797-65-0	E235.NO2-L	0.504 mg/L	0.5 mg/L	101	75.0	125	----
Anions and Nutrients (QCLot: 1284074)										
VA23D0307-002	WLNG US 1	Sulfate (as SO4)	14808-79-8	E235.SO4	104 mg/L	100 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 1288485)										
VA23D0307-002	WLNG US 1	Kjeldahl nitrogen, total [TKN]	----	E318	2.42 mg/L	2.5 mg/L	96.8	70.0	130	----
Anions and Nutrients (QCLot: 1288486)										
VA23D0307-002	WLNG US 1	Nitrogen, total	7727-37-9	E366	0.396 mg/L	0.4 mg/L	98.9	70.0	130	----
Anions and Nutrients (QCLot: 1288487)										
VA23D0307-002	WLNG US 1	Phosphorus, total	7723-14-0	E372-U	0.0438 mg/L	0.05 mg/L	87.7	70.0	130	----
Anions and Nutrients (QCLot: 1288488)										
VA23D0307-002	WLNG US 1	Ammonia, total (as N)	7664-41-7	E298	0.116 mg/L	0.1 mg/L	116	75.0	125	----
Organic / Inorganic Carbon (QCLot: 1288489)										
VA23D0307-002	WLNG US 1	Carbon, dissolved organic [DOC]	----	E358-L	5.08 mg/L	5 mg/L	102	70.0	130	----
Total Sulfides (QCLot: 1284118)										
CG2317768-015	Anonymous	Sulfide, total (as S)	18496-25-8	E395	0.225 mg/L	0.2 mg/L	112	75.0	125	----
Total Metals (QCLot: 1281719)										
VA23D0287-002	Anonymous	Aluminum, total	7429-90-5	E420	ND mg/L	0.2 mg/L	ND	70.0	130	----
		Antimony, total	7440-36-0	E420	0.0190 mg/L	0.02 mg/L	95.2	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.0198 mg/L	0.02 mg/L	99.0	70.0	130	----
		Barium, total	7440-39-3	E420	0.0188 mg/L	0.02 mg/L	94.0	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: 1281719) - continued										
VA23D0287-002	Anonymous	Beryllium, total	7440-41-7	E420	0.0380 mg/L	0.04 mg/L	95.1	70.0	130	----
		Bismuth, total	7440-69-9	E420	0.00971 mg/L	0.01 mg/L	97.1	70.0	130	----
		Boron, total	7440-42-8	E420	0.098 mg/L	0.1 mg/L	97.6	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.00399 mg/L	0.004 mg/L	99.7	70.0	130	----
		Calcium, total	7440-70-2	E420	ND mg/L	4 mg/L	ND	70.0	130	----
		Cesium, total	7440-46-2	E420	0.00981 mg/L	0.01 mg/L	98.1	70.0	130	----
		Chromium, total	7440-47-3	E420	0.0400 mg/L	0.04 mg/L	100	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.0200 mg/L	0.02 mg/L	100	70.0	130	----
		Copper, total	7440-50-8	E420	0.0196 mg/L	0.02 mg/L	97.8	70.0	130	----
		Iron, total	7439-89-6	E420	1.93 mg/L	2 mg/L	96.5	70.0	130	----
		Lead, total	7439-92-1	E420	0.0192 mg/L	0.02 mg/L	96.0	70.0	130	----
		Lithium, total	7439-93-2	E420	0.0920 mg/L	0.1 mg/L	92.0	70.0	130	----
		Magnesium, total	7439-95-4	E420	ND mg/L	1 mg/L	ND	70.0	130	----
		Manganese, total	7439-96-5	E420	0.0185 mg/L	0.02 mg/L	92.7	70.0	130	----
		Molybdenum, total	7439-98-7	E420	0.0200 mg/L	0.02 mg/L	100	70.0	130	----
		Nickel, total	7440-02-0	E420	0.0400 mg/L	0.04 mg/L	100.0	70.0	130	----
		Phosphorus, total	7723-14-0	E420	9.78 mg/L	10 mg/L	97.8	70.0	130	----
		Potassium, total	7440-09-7	E420	3.89 mg/L	4 mg/L	97.2	70.0	130	----
		Rubidium, total	7440-17-7	E420	0.0199 mg/L	0.02 mg/L	99.3	70.0	130	----
		Selenium, total	7782-49-2	E420	0.0400 mg/L	0.04 mg/L	100	70.0	130	----
		Silicon, total	7440-21-3	E420	9.68 mg/L	10 mg/L	96.8	70.0	130	----
		Silver, total	7440-22-4	E420	0.00395 mg/L	0.004 mg/L	98.7	70.0	130	----
		Sodium, total	7440-23-5	E420	ND mg/L	2 mg/L	ND	70.0	130	----
		Strontium, total	7440-24-6	E420	ND mg/L	0.02 mg/L	ND	70.0	130	----
		Sulfur, total	7704-34-9	E420	18.9 mg/L	20 mg/L	94.4	70.0	130	----
		Tellurium, total	13494-80-9	E420	0.0399 mg/L	0.04 mg/L	99.7	70.0	130	----
		Thallium, total	7440-28-0	E420	0.00381 mg/L	0.004 mg/L	95.3	70.0	130	----
		Thorium, total	7440-29-1	E420	0.0155 mg/L	0.02 mg/L	77.7	70.0	130	----
		Tin, total	7440-31-5	E420	0.0194 mg/L	0.02 mg/L	97.1	70.0	130	----
		Titanium, total	7440-32-6	E420	0.0377 mg/L	0.04 mg/L	94.3	70.0	130	----
		Tungsten, total	7440-33-7	E420	0.0194 mg/L	0.02 mg/L	96.8	70.0	130	----
		Uranium, total	7440-61-1	E420	0.00370 mg/L	0.004 mg/L	92.5	70.0	130	----
		Vanadium, total	7440-62-2	E420	0.0999 mg/L	0.1 mg/L	99.9	70.0	130	----
		Zinc, total	7440-66-6	E420	0.397 mg/L	0.4 mg/L	99.2	70.0	130	----
		Zirconium, total	7440-67-7	E420	0.0386 mg/L	0.04 mg/L	96.4	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: 1284645)										
VA23D0249-023	Anonymous	Mercury, total	7439-97-6	E508	0.000116 mg/L	0.0001 mg/L	116	70.0	130	----
Dissolved Metals (QCLot: 1282398)										
VA23D0323-002	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.194 mg/L	0.2 mg/L	97.2	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.0210 mg/L	0.02 mg/L	105	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.0198 mg/L	0.02 mg/L	99.3	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	0.0386 mg/L	0.04 mg/L	96.4	70.0	130	----
		Bismuth, dissolved	7440-69-9	E421	0.00977 mg/L	0.01 mg/L	97.7	70.0	130	----
		Boron, dissolved	7440-42-8	E421	0.096 mg/L	0.1 mg/L	96.2	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.00396 mg/L	0.004 mg/L	99.1	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	0.0104 mg/L	0.01 mg/L	104	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.0405 mg/L	0.04 mg/L	101	70.0	130	----
		Cobalt, dissolved	7440-48-4	E421	0.0198 mg/L	0.02 mg/L	98.9	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.0194 mg/L	0.02 mg/L	97.3	70.0	130	----
		Iron, dissolved	7439-89-6	E421	1.96 mg/L	2 mg/L	97.9	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.0200 mg/L	0.02 mg/L	100	70.0	130	----
		Lithium, dissolved	7439-93-2	E421	0.0957 mg/L	0.1 mg/L	95.7	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	1 mg/L	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	0.0199 mg/L	0.02 mg/L	99.7	70.0	130	----
		Molybdenum, dissolved	7439-98-7	E421	0.0203 mg/L	0.02 mg/L	101	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.0402 mg/L	0.04 mg/L	101	70.0	130	----
		Phosphorus, dissolved	7723-14-0	E421	10.2 mg/L	10 mg/L	102	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	3.95 mg/L	4 mg/L	98.8	70.0	130	----
		Rubidium, dissolved	7440-17-7	E421	0.0194 mg/L	0.02 mg/L	97.1	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.0413 mg/L	0.04 mg/L	103	70.0	130	----
		Silicon, dissolved	7440-21-3	E421	9.85 mg/L	10 mg/L	98.5	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.00412 mg/L	0.004 mg/L	103	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	1.91 mg/L	2 mg/L	95.6	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	19.1 mg/L	20 mg/L	95.5	70.0	130	----
		Tellurium, dissolved	13494-80-9	E421	0.0400 mg/L	0.04 mg/L	100.0	70.0	130	----
		Thallium, dissolved	7440-28-0	E421	0.00414 mg/L	0.004 mg/L	104	70.0	130	----
		Thorium, dissolved	7440-29-1	E421	0.0203 mg/L	0.02 mg/L	101	70.0	130	----
		Tin, dissolved	7440-31-5	E421	0.0204 mg/L	0.02 mg/L	102	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: 1282398) - continued										
VA23D0323-002	Anonymous	Titanium, dissolved	7440-32-6	E421	0.0388 mg/L	0.04 mg/L	97.0	70.0	130	----
		Tungsten, dissolved	7440-33-7	E421	0.0200 mg/L	0.02 mg/L	100	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	0.00397 mg/L	0.004 mg/L	99.2	70.0	130	----
		Vanadium, dissolved	7440-62-2	E421	0.102 mg/L	0.1 mg/L	102	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	0.401 mg/L	0.4 mg/L	100	70.0	130	----
		Zirconium, dissolved	7440-67-7	E421	0.0407 mg/L	0.04 mg/L	102	70.0	130	----
Dissolved Metals (QCLot: 1284768)										
VA23D0256-002	Anonymous	Mercury, dissolved	7439-97-6	E509	0.000104 mg/L	0.0001 mg/L	104	70.0	130	----
Aggregate Organics (QCLot: 1286734)										
CG2317850-002	Anonymous	Phenols, total (4AAP)	----	E562	0.0210 mg/L	0.02 mg/L	105	75.0	125	----
Aggregate Organics (QCLot: 1287194)										
FJ2303321-002	Anonymous	Chemical oxygen demand [COD]	----	E559-L	108 mg/L	100 mg/L	108	75.0	125	----

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	Report Format / Distribution	Select Service Level Below - Contact your AM to confirm all E&P TATs (surcharges may apply)
Company:	Triton Environmental	Select Report Format: ☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)	Regular [R] ☑ Standard TAT if received by 3 pm - business days - no surcharges apply
Contact:		Quality Control (QC) Report with Report ☑ YES ☐ NO	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)] ☐
Phone:		☑ 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:	1730-1111 West Georgia Street	Email 1 or Fax	Date and Time Required for all E&P TATs: dd-mmm-yy hh:mm
City/Province:	Vancouver/BC	Email 2	For tests that can not be performed according to the service level selected, you will be contacted.
Postal Code:	V6E 4M3	Email 3	
Invoice To	Same as Report To ☐ YES ☑ NO	**Invoice Distribution**	**Analysis Request**
	Copy of Invoice with Report ☐ YES ☑ NO	Select Invoice Distribution: ☑ EMAIL ☑ MAIL ☑ FAX	Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below
Company:		Email 1 or Fax	
Contact:		Email 2	

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	VA23-TRIT100-012	AFE/Cost Center:	PO#
Job #:		Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (lab use only):	DO307	ALS Contact: Can Dang	Sampler:

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	Total mercury	Dissolved metals	Dissolved mercury	TSS	TDS	Nutrients (ammonia, ammonium, TKN, total nitrogen, total phosphorus, phenols, COD,	Total sulfide (as H2S), Unionized Sulfide	Anions scan (Br, Cl, F, NO2, NO3, SO4)	General parameters (alkalinity)	DOC	SAMPLES ON HOLD	Sample is hazardous (please provide further details	NUMBER OF CONTAINERS
							F	F			P	P			F/P			
	WLNG DS 1	18-Dec-23	11:40	Water	R	R	R	R	R	R	R	R	R	R	R		N	8
	pH: 7.66 cond: 48mS/cm temp: 7.9°C																	
	WLNG US 1	18-Dec-23	09:20	Water	R	R	R	R	R	R	R	R	R	R	R		N	8
	pH: 7.80 cond: 34mS/cm temp: 7.1°C																	
	Duplicate N/A			~~Water~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~		N	8
	Field Blank N/A			~~Water~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~		~~N~~	~~8~~
	Trip Blank N/A			~~Water~~	~~R~~	~~R~~			~~R~~	~~R~~	~~R~~	~~R~~	~~R~~	~~R~~			N	5

Environmental Division
Vancouver
Work Order Reference
VA23D0307

Telephone : +1 604 253 4188

Drinking Water (DW) Samples[1] (client use)	Special Instructions / Specify (	wn list below
Are samples taken from a Regulated DW System? ☐ YES ☑ NO		
Are samples for human consumption/ use? ☐ YES ☑ NO	Triton project # 11964	

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			
				2			

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (lab use only)			FINAL SHIPMENT RECEPTION (lab use only)		
	Dec 18, 2023	Time: 17:17	Received by:	Date:	Time:	Received by: DJ	Date: Dec 19	Time: 5:26 pm

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION WHITE - LABORATORY COPY YELLOW - CLIENT COPY SEPT 2018 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.

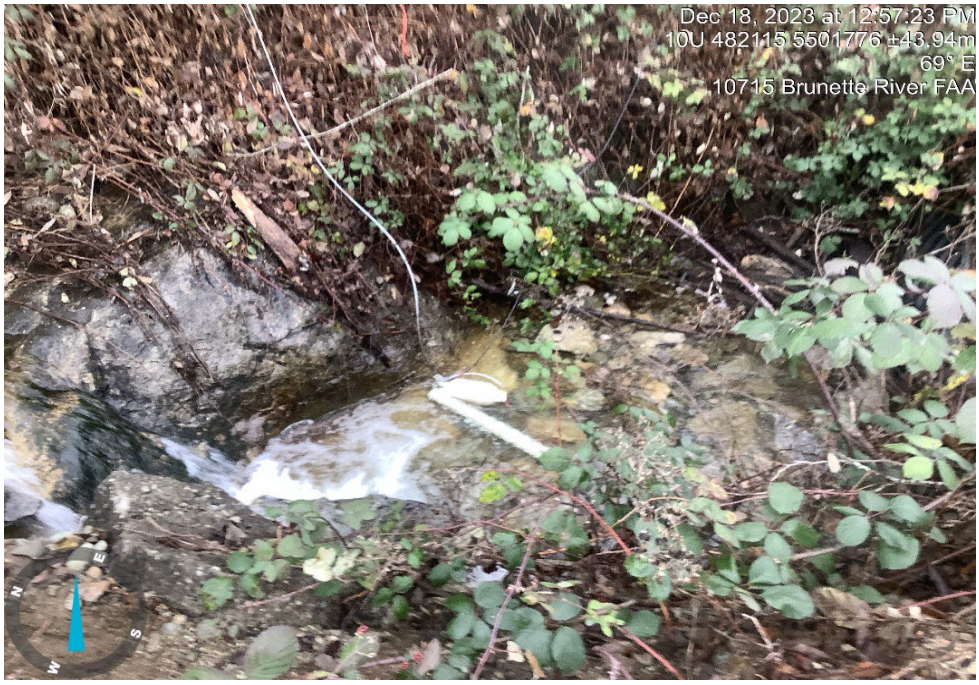
1. If any water samples are taken from a **Regulated Drinking Water (DW) System**, please submit using an **Authorized DW COC form**.

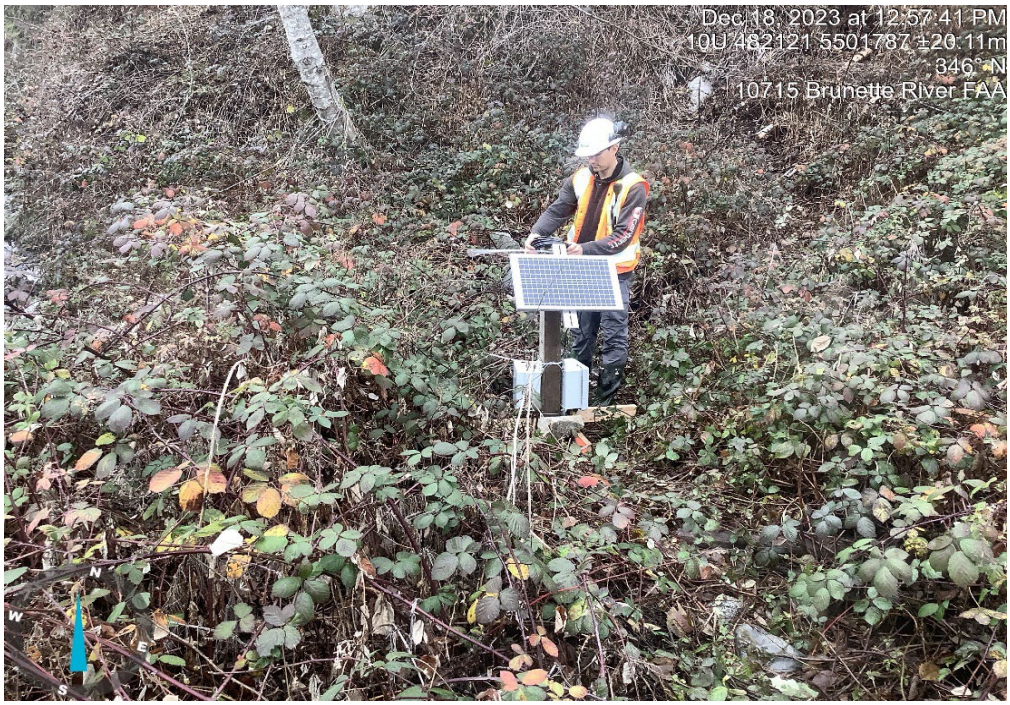
Receiving Environment Field Notes and Logs

InspectionDate	**12/18/2023**
Location	WLNG
SiteID	EAS DS1
Component	Tunnel
Permit	PE 110136
Site Name	Receiving Environment - Upstream of Discharge
Latitude	49.6683
Longitude	-123.247958
EM	Sam Blanchard
Air Temperature Low (°C)	6
Air Temperature High (°C)	10
Conditions	Clear
Ground Condition	Damp
Timestart	11:40:09
Flow Volume (visual)	moderate
Notes	N/A
Odour Detected	No
Odour	N/A
Colour Detected	No
Colour	N/A
Unusual Observations Detected	No
Unusual Observation	N/A
Sheen Detected	No
Sheen	N/A

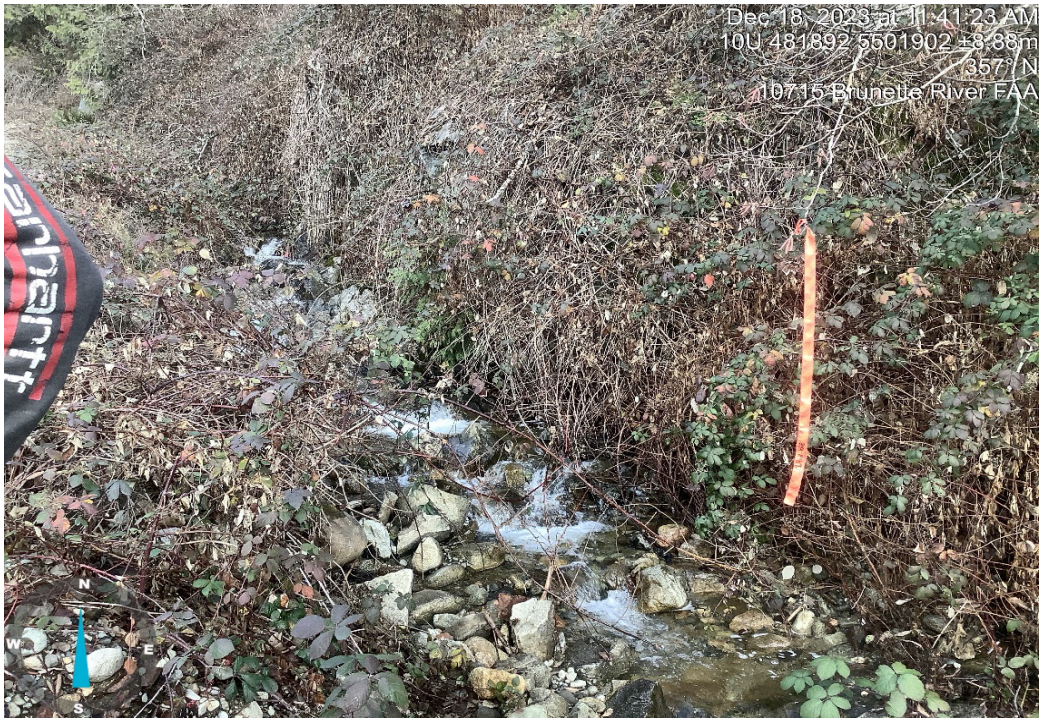
SAMPLES COLLECTED	
Total Metals Mercury	Yes
Dissolved Metals Mercury	Yes
TSS	Yes
TDS	Yes
Nutrients	Yes
DOC	Yes
General Parameters Alkalinity	Yes
Total Sulfide Unionized Sulfide	Yes
Anions	Yes
Other Sample	
Logger Maintenance Peformed	Yes
Logger Maintenance Comment	Downstream logger set up and installed.

Downstream Photos





Downstream Photos



InspectionDate	**12/18/2023**
Location	WLNG
SiteID	EAS US1
Component	Tunnel
Permit	PE 110136
Site Name	Receiving Environment - Upstream of Discharge
Latitude	49.669455
Longitude	-123.25087
EM	Sam Blanchard
Air Temperature Low (°C)	6
Air Temperature High (°C)	10
Conditions	Clear
Ground Condition	Damp
Timestart	9:23:46
Flow Volume (visual)	moderate
Notes	N/A
Odour Detected	No
Odour	N/A
Colour Detected	No
Colour	N/A
Unusual Observations Detected	No
Unusual Observation	N/A
Sheen Detected	No
Sheen	N/A

SAMPLES COLLECTED	
Total Metals Mercury	Yes
Dissolved Metals Mercury	Yes
TSS	Yes
TDS	Yes
Nutrients	Yes
DOC	Yes
General Parameters Alkalinity	Yes
Total Sulfide Unionized Sulfide	Yes
Anions	Yes
Other Sample	
Logger Maintenance Peformed	Yes
Logger Maintenance Comment	Set up of upstream logger.

Upstream Photos

Upstream Photos