PEACE RIVER REGIONAL DISTRICT

Electoral Area Directors Committee Meeting
Agenda

February 13, 2025, 10:00 a.m.
1981 Alaska Avenue, Dawson Creek, BC

			Pages
1.	**CALL TO ORDER**		
2.	**ADOPTION OF AGENDA**		
3.	**GALLERY COMMENTS OR QUESTIONS**		
4.	**ADOPTION OF MINUTES**		
	4.1	Electoral Area Directors Committee Draft Meeting of January 24, 2025	3
5.	**BUSINESS ARISING FROM THE MINUTES**		
6.	**DELEGATIONS**		
	6.1	Peace River Forage Association Re: Expanding Crop Horizons Nadia Mori - Coordinator, PRFA Harris Ford - Manager, South Peace Grain Cleaning	7
7.	**CORRESPONDENCE**		
8.	**REPORTS**		
	8.1	Rose Prairie Water Well Drilling Program Update, ENV-EADC-041 *That the Electoral Area Directors Committee defer the report titled "Rose Prairie Water Well Drilling Program Update, ENV-EADC–041" to the next EADC meeting and forward all relevant information on the Rose Prairie Water Well Drilling Program to Alternate Director Graham.*	18
9.	**NEW BUSINESS**		
10.	**DIARY**		
	10.1	EADC Diary	220
11.	**CONSENT CALENDAR**		
	11.1	EADC Terms of Reference	221
12.	**NOTICE OF MOTION**		
13.	**RECESS TO CLOSED SESSION**		

13.1 Notice of Closed EADC Session – February 13, 2025, ADM-EADC-061 222

14. ADJOURNMENT

PEACE RIVER REGIONAL DISTRICT

ELECTORAL AREA DIRECTORS COMMITTEE
MINUTES

January 24, 2025, 1:00 p.m.
1981 Alaska Avenue, Dawson Creek, BC

Directors Present:	Chair Rose, Electoral Area E (via Zoom) Vice-Chair Sperling, Electoral Area C (Chaired the meeting) Director Hiebert, Electoral Area D Reid Graham, Alternate Director Electoral Area B (via Zoom)
Staff Present:	Shawn Dahlen, Chief Administrative Officer Tyra Henderson, Corporate Officer Roxanne Shepherd, Chief Financial Officer Joanne Caldecott, Deputy Corporate Officer Kari Bondaroff, General Manager of Environmental Services Kevin Clarkson, General Manager of Community Services Daris Gillis, Environmental Services Manager Gerritt Lacey, Solid Waste Services Manager Trevor Ouellette, IT Manager Katherine Lovino, Administrative Clerk/Recorder

---

1. CALL TO ORDER

Vice-Chair Sperling called the meeting to order at 1:00 p.m.

2. ADOPTION OF AGENDA

MOVED Director Hiebert
SECONDED Chair Rose

That the Electoral Area Directors Committee agenda for January 24, 2025, be adopted:

1. CALL TO ORDER
2. ADOPTION OF AGENDA
3. GALLERY COMMENTS OR QUESTIONS
4. ADOPTION OF MINUTES
4.1 Electoral Area Directors Committee Draft Meeting Minutes of December 12, 2024
5. BUSINESS ARISING FROM THE MINUTES
6. DELEGATIONS
7. CORRESPONDENCE
8. REPORTS
8.1 Rose Prairie Water Well Drilling Program Update, ENV-EADC-041
8.2 PRRD NDIT Grant Application – Grant Writing Services, ADM-EADC-059
9. NEW BUSINESS
10. DIARY
10.1 Diary Updates, ADM-EADC-060
10.2 EADC Diary

(Cont'd on next page)

11. CONSENT CALENDAR
11.1 EADC Terms of Reference
12. NOTICE OF MOTION
13. ADJOURNMENT

CARRIED

3. GALLERY COMMENTS OR QUESTIONS

4. ADOPTION OF MINUTES

4.1 Electoral Area Directors Committee Draft Meeting Minutes of December 12, 2024

MOVED Director Hiebert
SECONDED Alternate Director Graham
That the Electoral Area Directors Committee Meeting Minutes of December 12, 2024 be adopted.

CARRIED

5. BUSINESS ARISING FROM THE MINUTES

6. DELEGATIONS

7. CORRESPONDENCE

8. REPORTS

8.1 Rose Prairie Water Well Drilling Program Update, ENV-EADC-041

MOVED Alternate Director Graham
SECONDED Director Hiebert
That the Electoral Area Directors Committee receive the report titled "Rose Prairie Water Well Drilling Program Update, ENV-EADC-041" for discussion.

CARRIED

Alternate Director Graham noted the close proximity of the proposed drilling for the fourth well being 50m away from the drilling site of the third well which had not been successful. He questioned incurring further expense when the chances of a successful outcome did not seem strong and indicated hesitance in approving the recommendation in light of the past outcomes for well drilling and ahead of the Area B by-election.

Staff provided background information on the Rose Prairie Water Well Drilling Program which included the following points:

- There was absolutely no guarantee that drilling the fourth well would be successful.
- During drilling of the third well, there were complications and the well collapsed on itself.
- During drilling of the third well, the samples obtained did not have any traces of H2S and/or methane, however the samples had traces of arsenic. Staff does not know whether the current water treatment facility will be able to remove arsenic.
- The well in existence can be used for observation in the future.

- The Engineering company recommended that the next well should be drilled within 50m of the third well to allow for accurate observation; the hope being to hit the same seam of water as the third well, however results are uncertain without full testing.
- No probability or level of confidence has been provided by the drilling company for the fourth well.
- The definition for an observation well is required by the ground water regulations.
- The station was originally equipped with a pilot granular activated carbon filtration system that needed to be upgraded however the cost of upgrading to a fully activated carbon treatment facility with aeration had risen to between $2.8 and $4.5 million resulting in the decision to seek an alternative water source.
- A survey was done to determine acceptable locations and the North Peace Regional Park well was chosen as the preferred site. Testing was done at the site however the water was deemed unsuitable, and Board direction was to move the station and drill three additional wells in the vicinity of the new location in the hopes of finding an alternative source of water. The first two wells did not have adequate flow rates, and water from the third well could not be treated due to the elements present.
- Costs of drilling to date total $275,509 and the cost to drill the fourth well was estimated at $60,000.
- Funding has been earmarked for this work and would be made available if necessary.

Staff noted that at the community meeting held with Rose Prairie residents and the former Electoral Area B Director, the desire for a water source in the area was made very clear. If the project was turned down, the next alternative would be to look for another water source; the existing site would have to be decommissioned with landowners given back access to piped water. However, financial considerations at the site must be considered. The Committee agreed that Alternate Director Graham would benefit from reviewing the past documentation on the program to help inform his decision.

MOVED Alternate Director Graham
SECONDED Director Hiebert
That the Electoral Area Directors Committee defer the report titled "Rose Prairie Water Well Drilling Program Update, ENV-EADC–041" to the next EADC meeting and forward all relevant information on the Rose Prairie Water Well Drilling Program to Alternate Director Graham. **CARRIED**

8.2 PRRD NDIT Grant Application – Grant Writing Services, ADM-EADC-059

MOVED Director Hiebert
SECONDED Chair Rose
That the Electoral Area Directors Committee recommend that the Regional Board authorize the submission of a grant application to Northern Development Initiative Trust - Grant Writing Support for a grant of up to $8,000 to be used for rural Grant Writing Services; further, that the Peace River Regional District commit to providing financial resources to fund grant writing services in excess of the grant amount and to cover expenses not eligible under the grant program; and finally, that funding for rural Grant Writing Services be included in the 2025 Financial Plan under Function 120 - Legislative Electoral Area. **CARRIED**

9. NEW BUSINESS

10. DIARY

Directors discussed the report titled "Diary Updates – ADM-EADC-060" requesting that the Agriculture Advisory Committee be removed from the Electoral Area Directors Committee Diary. Staff noted that the Committee had comprehensively explored the issue as requested and, given that the requested information had been reported in November 2024 with no further direction to pursue a committee, removal of the item was recommended since the associated work had been completed. However, Director Hiebert requested that the item remain on the Diary until the new Electoral Area B Director has been elected.

MOVED Director Hiebert
SECONDED Alternate Director Graham
That the Electoral Area Directors Committee receive the January 24, 2024 Diary for information.

CARRIED
Opposed: Chair Rose

11. CONSENT CALENDAR

11.1 EADC Terms of Reference

12. NOTICE OF MOTION

13. ADJOURNMENT

The Chair adjourned the meeting at 1:26 p.m.

CERTIFIED a true and correct copy of the Minutes of the Peace River Regional District's Electoral Area Directors Committee meeting held on January 24, 2025 in the PRRD Board Room, 1981 Alaska Avenue, Dawson Creek, BC.

Brad Sperling, Chair

Katherine Lovino, Administrative Clerk/Recorder

Peace River Forage Association of British Columbia

Expanding Crop Horizons

Supporting agricultural adaptation in the Peace

PRRD Electoral Area Director's Meeting
Feb 13, 2025

Peace River Forage Association of British Columbia

About PRFA

A non-profit, producer-led organization dedicated to advancing sustainable and profitable agricultural systems through applied research, demonstration projects, and knowledge transfer.

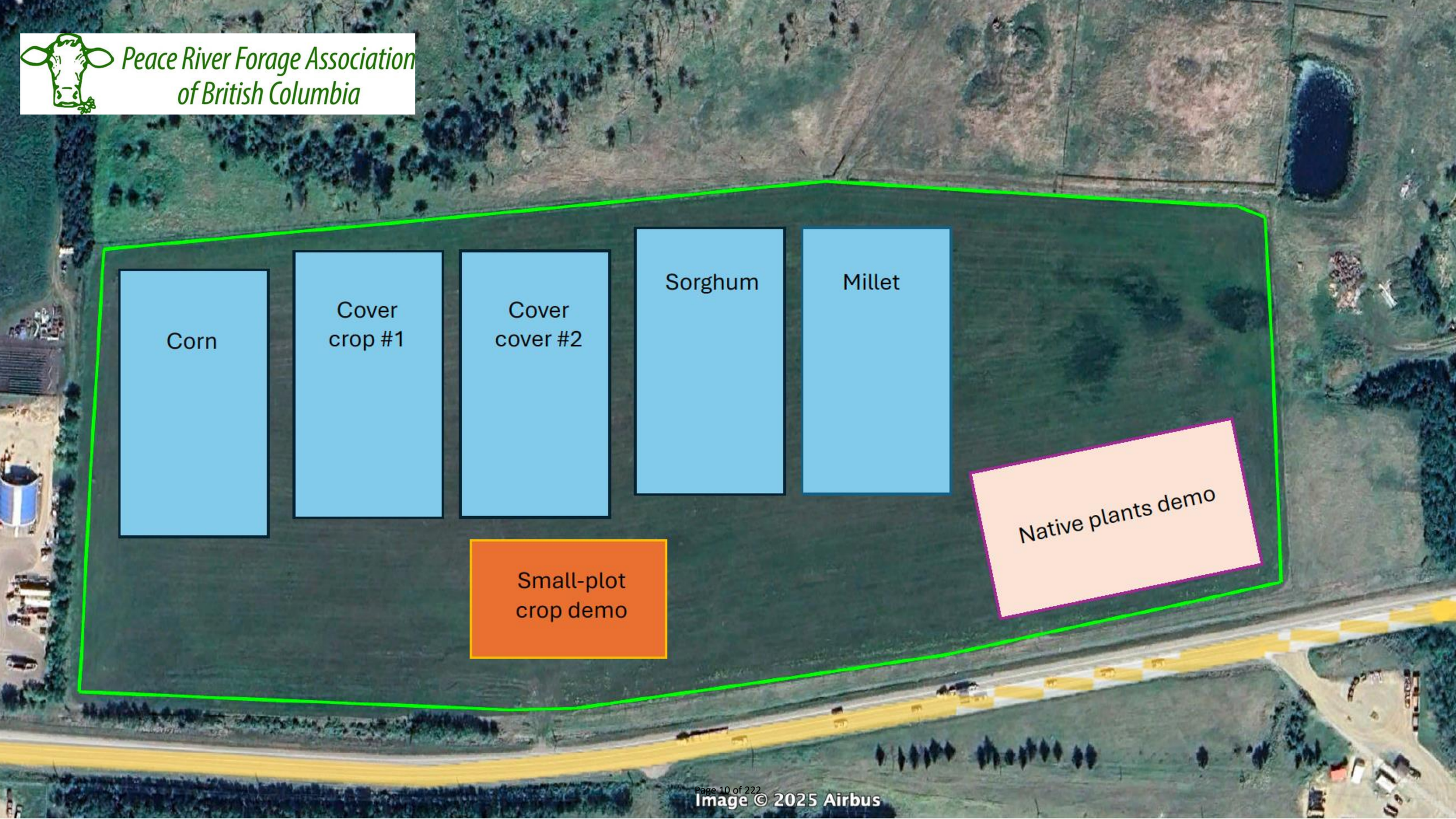
Bringing over 30 years of experience

- Published over 100 Factsheets
- Over 160 Members and growing
- Experienced in Project Management

Peace River Forage Association of British Columbia

What we are Proposing

- The Northern Lights College in Dawson Creek currently has an under utilized plot of prime land located along Hwy 49 when exiting DC on the east end.
- PRFA of BC is proposing to take a lead on implementing crop demonstration plots to test feasibility and adaptability of diverse crop options in the Peace Region.
- This will be the first year of a multi-year project.


Peace River Forage Association of British Columbia
Corn
Cover crop #1
Cover cover #2
Sorghum
Millet
Native plants demo
Small-plot crop demo
Image © 2025 Airbus

A Collaborative Community Approach

Peace River Forage Association of British Columbia

Why Plot work is important

Regionally relevant information

- Historically, small plot programs provided producers with critical data on crop adaptation and performance under region specific conditions
- Discontinuation of these programs has left a major gap in availability of such information, forcing producers to seek guidance from out of region
- Reliance on external data increases uncertainty and limits informed decision making

Peace River Forage Association of British Columbia

Benefits to the Region

- Tangible support for agricultural producers
- Cross-commodity collaboration opportunities
- Broad range of knowledge sharing opportunities
- Hands-on learning opportunities for NLC students
- Indigenous Collaborations on native seed demo
- Promotional opportunities for local companies
- High visibility of project location

Peace River Forage Association of British Columbia

Project Budget

Project Costs

Project Fees	$	15,780.00
Materials & Supplies	$	13,793.00
Personnel	$	22,980.00
Travel	$	4,390.00
Knowledge Transfer	$	22,500.00
Total Project Cost	**$**	**79,443.00**

PRFA Admin & Overhead 8.5%

Project Funding

Youth Emloyment and Skills Program	$	10,000.00
Grain Industry Development Council Grant	$	56,333.00
In-Kind Contributions	$	5,110.00
Sutotal	**$**	**71,443.00**
PRRD Funding Request	**$**	**8,000.00**

Peace River Forage Association of British Columbia

Questions

Thank you for the opportunity
to share our exciting project

Harris Ford
sales@spgrain.ca

Nadia Mori MSc, PAg
coordinator@peaceforage.bc.ca

PEACE RIVER REGIONAL DISTRICT

REPORT

To: Electoral Area Directors Committee Report Number: ENV-EADC-041

From: Environmental Services Date: January 24, 2025

Subject: Rose Prairie Water Well Drilling Program Update

RECOMMENDATION:

That the Electoral Area Directors Committee recommend that the Regional Board proceed with amending the Rose Prairie Drilling Authorization Agreement with the landowner, approve drilling a fourth well within 50m of the third drilling location, and continue with the testing and sampling program to determine suitability of the water for treatment at the existing Rose Prairie Water Station to be funded through Electoral Area B Peace River Agreement Funds committed on December 14, 2023 from Spending Item # 1 – Potable Water and Feasibility Studies.

BACKGROUND/RATIONALE:

The Rose Prairie Bulk Potable Water Station was constructed in 2018 along with four other water stations in Electoral Area B. The Rose Prairie Water Station has never opened to the public. The water station has experienced many obstacles to opening since construction as outlined below:

2018 – 2019

- Rose Prairie Water Station was constructed and commissioned.
- Post commissioning treated water samples showed higher turbidity levels in the produced water than permitted by the Canadian Drinking Water Quality Guidelines (CDWQG) and by Northern Health standards. Proven reduction of turbidity was necessary before obtaining operating permits and licensing.
- The PRRD contracted Urban Systems to conduct a Granulated Activated Carbon (GAC) Pilot to assess turbidity reduction through GAC filtration to meet permitted levels. The pilot revealed that the selected filters were not viable in the long term due to high operational costs.
- The PRRD conducted a Phase 2 GAC Pilot with a modified filtration type to decrease turbidity and optimize operational costs. The outcomes demonstrate that the revised filtration type in Phase 2 successfully achieved the required turbidity levels in the produced water.

2021

- February 11/12 – The PRRD received a Water License and Northern Health Operating Permit based on the Phase 2 GAC pilot results.
- February 22 – The Rose Prairie Water Station was scheduled to open to the public.
- February 21 - Unsafe levels of explosive gases were detected at the Rose Prairie Water Station during routine inspections by facility operators. The station remained closed for further investigation.
- March 11 – The Regional Board officially closed the Rose Prairie Water Station and approved the investigation of an alternative water source and improved treatment options for the existing water source.

- June – TetraTech was awarded the "RFP#28-2021 – Feasibility Study Water Source Area B"" to identify alternative water sources and examine potential treatment options to remove dissolved gases from the Rose Prairie water source.
- September – Results of the alternative water source study was presented to EADC and deferred until testing of the Rose Prairie water and well was completed.
- October – TetraTech completed testing of the dissolved gases in the Rose Prairie water. Results indicated levels of methane and hydrogen sulfide dissolved in the water.
- December – TetraTech proceeds with designing conceptual treatment options for gases and turbidity.

2022

- February 17 – A report outlining **conceptual** treatment options for the dissolved gases and turbidity issues including a Class D cost estimate of $1,350,000 including a 40% contingency was provided to the EADC. Decisions to move forward were deferred until a public meeting could be held with the Rose Prairie residents to discuss costs and measure their support for necessary upgrades.
- March 31 – A meeting was held with Rose Prairie residents outlining alternative sources, and estimated costs for treatment of the upgrades at the existing station. A survey was conducted at the same time for residents to state their level of support of alternative options and offer additional feedback. Results of the survey and the meeting indicate many residents are in support of the upgrades and the costs of the Rose Prairie Water Station.
- December - Funds were allocated to the Area B Potable Water Budget to cover engineering and construction for the water treatment upgrades at the Rose Prairie Water Station.

2023

- April 27 - Electoral Area Directors Committee recommends that construction design commences, and staff can procure a construction firm.
- July – TetraTech inspects the Rose Prairie Water Station to collect details of the existing components of the station and systems.
- September - Based on the information gathered during a site inspection and required changes to the conceptual design, TetraTech's estimate to complete the necessary safety and treatment upgrades is reported to cost from $2.9 - $4.5 million with a +/- 40% contingency.

2024

- January 26 – The Electoral Area Directors Committee recommends pursual of options for exploring a new well in the vicinity of the existing well to find aa better source of water using the existing pre-approved Rose Prairie Water Station PRA Allocation.
- February – Staff work with TetraTech Canada to conduct a hydrogeological assessment to determine potential drilling locations in proximity to the existing Rose Prairie Water Station and develop a drilling and testing program.
- July – Staff procure Carbon Mountain Drilling to conduct the drilling and testing program for potential new well locations.
- August – November – Drilling and gas and water testing program occurs.
- December – TetraTech analyzes drilling and sampling results and compiled the 2024 Field Program Summary – Alternate Water Source Viability Testing for the Rose Prairie Area.

The drilling and testing program had minimum requirements for a new water well to meet the treatment design of the existing Rose Prairie Water Station. A new well must have a minimum of 20

gallons per minute flow rate and be free of any gases or substances that the existing treatment system could not remove.

Based on the drilling and testing program results, drilling locations one and two do not meet the minimum requirements and are not suitable for treatment with the existing Rose Prairie Water Station design. As drilling location three was not fully developed and tested as per the drilling and testing program plan, it is recommended to be used as an observation well for an additional fourth test well.

Based on the location three sampling results, the water contains elements that exceed the drinking water standards and may be treatable using the existing treatment system. Further, there is an additional risk that with further well development flow rates may reduce below the minimum 20 gal/min or elemental elements may be present in the new location. This may result in necessary treatment testing and capital upgrades, including the need for additional water storage.

ALTERNATIVE OPTIONS:

1. That the Electoral Area Directors Committee recommend that the Regional Board proceed with decommissioning and reclamation of the existing Rose Prairie Water Station and affiliated assets, to be funded through Electoral Area B Peace River Agreement Funds committed on December 14, 2023, from Spending Item # 1 – Potable Water and Feasibility Studies.
2. That the Electoral Area Directors Committee provide further direction.

STRATEGIC PLAN RELEVANCE:

☒ Asset and Infrastructure Management

FINANCIAL CONSIDERATION(S):

The available capital budget for the Rose Prairie Water project is $651,831. Previously committed Electoral Area B Peace River Agreement Funds and Electoral Area B Gas Tax Funds are funding the capital project.

Table 1: Project Expenses

Project Expense	Expenses to Date
Drilling	$ 97,370.00
Sampling	$ 63,423.00
Engineering	$ 114,716.00
Total Project Expenses	**$ 275,509.00**

Table 2: Project Funding Commitments

Grant Source	Original Funding Commitment	Spend To Date	Remaining Commitment
Electoral Area B Peace River Agreement	$ 409,470.00	$ 275,509.00	$ 133,961.00
Electoral Area B Gas Tax	$ 407,000.00	$ 0.00	$ 407,000.00
Total Project Funding	**$ 816,470.00**	**$ 275,509.00**	**$ 540,961.00**

COMMUNICATIONS CONSIDERATION(S):

Staff will work to develop a communications strategy to inform the public of the final Regional Board decision.

OTHER CONSIDERATION(S):

Staff will modify contracts in alignment with the PRRD Purchasing Policy to allow for a contract extension and an increase to the sampling contract, as well as a contract extension for the drilling program.

Attachments:
1. 2024 Field Program Summary – Alternate Water Source Viability Testing for the Rose Prairie Area

TETRA TECH

January 15, 2025

ISSUED FOR USE
704-ENW.GENV03704-02
Via Email: Daris.Gillis@prrd.bc.ca

Peace River Regional District
Box 810, 1981 Alaska Highway Avenue
Dawson Creek, BC V1G 4H8

Attention: Daris Gillis, Environmental Services Manager

Subject: 2024 Field Program Summary
Alternate Water Source Viability Testing
Rose Prairie Area

1.0 INTRODUCTION

The Peace River Regional District (PRRD) retained Tetra Tech Canada Inc. (Tetra Tech) for the provision of environmental consulting services. These services entail conducting a desktop hydrogeological assessment (Phase 1), and drilling exploratory boreholes, installing water source and observation wells, and conducting aquifer testing to support a groundwater licence application (Phase 2) at the properties listed below and shown on Figure 1 (herein referred to as 'the site').

- The Northwest Quadrant, Section 22, Township 86, Range 18, West of the 6th Meridian, Peace River District.
- The Southwest Quadrant, Section 22, Township 86, Range 18, West of the 6th Meridian, Peace River District.
- The Northwest Quadrant, Section 15, Township 86, Range 18, West of the 6th Meridian, Peace River District.

A technical memorandum (memo) presenting the results of the Phase 1 hydrogeological desktop assessment, proposed options for Phase 2 including exploratory drilling and well testing, and associated cost estimate was submitted to PRRD on April 20, 2024 (Tetra Tech 2024a).

During Phase 2 fieldwork, Tetra Tech oversaw the exploratory drilling of the three proposed drilling locations as shown on Figure 1. A prolific water bearing zone was observed at Location 3 and the core pipe was left in-place to allow for a future installation of a monitoring well if the Regional Board approves the drilling and installation of another well in the vicinity of Location 3. Locations 1 and 2 were deemed capable of producing insufficient quantity of water and are planned to be reclaimed.

This report provides methods and results of the Phase 2 fieldwork conducted until December 2024, including a summary of the exploratory drilling at Location 1 to Location 3, and core pipe installation, development, and groundwater and gas sampling at Location 3.

1.1 Objective

The objectives of the project were to:

- Conduct an exploratory drilling program to assess if an aquifer capable of producing a minimum of 20 US gallons per minute (USgpm) is present below the site; and
- Construct a water well and conduct an aquifer testing program to support a groundwater diversion licence application.

Tetra Tech Canada Inc.
Suite 110, 140 Quarry Park Blvd SE
Calgary, AB T2C 3G3 CANADA
Tel 403.203.3355 Fax 403.203.3301

It is understood that the groundwater extracted needs to be free from hydrocarbons or dissolved explosive gases, and be suitable for treatment by the existing Rose Prairie Water Station.

2.0 SCOPE OF WORK

To achieve the project objective, the following scope of work was proposed:

1. Exploratory Borehole Drilling
2. Well Installation
3. Well Development
4. Groundwater and Gas Sampling
5. Aquifer Testing

Aquifer Testing was not completed as the water source well at Location 3 has not been installed. The details of the methods and results for the completed scope of work are provided in Sections 3.0 and 4.0, respectively. Conclusions and recommendations are provided in Sections 5.0 and 6.0, respectively.

3.0 METHODS

3.1 Exploratory Borehole Drilling

During the site visit and underground utility survey on August 12, 2024, Tetra Tech confirmed the proposed drilling locations with PRRD. From August 12 to 19, 2024 and September 6 to 7, 2024, Tetra Tech supervised the exploratory drilling of the three proposed locations (Location 1 to Location 3) as shown on Figure 1. Carbon Mountain Drilling (Carbon Drilling), based out of Fort St. John, BC, drilled at these locations using an air rotary drill rig. A 152 mm (6-inch) diameter exploratory borehole was advanced, and lithology was observed and logged at each location. During drilling, Tetra Tech personnel logged the drill cuttings to record the observed lithologies. Any other notable observations were also recorded, along with the associated depths.

A prolific water bearing zone was observed at Location 3 from about 140 to 159 m below grade. Locations 1 and 2 were deemed capable of producing insufficient quantity of water. The core pipe was installed at Location 3 to facilitate the collection of representative gas and groundwater samples.

The boreholes drilled at Locations 1 and 2 will need to be abandoned and backfilled with bentonite chips and/or drill cuttings following the regulatory requirements as per Part 3 – Well Construction, of the British Columbia Water Sustainability Act, Groundwater Protection Regulation B.C. Reg. 39/2016 (Government of B.C. 2022).

3.2 Initial Sampling from Borehole and Well Installation

Prior to installation of the the core pipe, gas and groundwater samples were collected from the open borehole at Location 3 on September 9, 2024. The collected gas samples were analyzed for methane (CH_4), and sulphur compounds including hydrogen sulphide (H_2S). The collected groundwater samples were analyzed for the following:

- Dissolved gases (CH_4, H_2S)
- Routine (Turbidity, Electrical Conductivity (EC), Total Dissolved Solids (TDS), Color, total Hardness, pH, total Alkalinity)

- Anions (chloride, Sulfate, Fluoride, Nitrate, Nitrite, Sulphide as S, Sulphide as H_2S, hydroxide, carbonate, bicarbonate)
- Physical test (UV absorbance 254 mm, UV transmittance)
- H_2S
- Dissolved metals
- Total metals (including mercury and cyanide)
- Dissolved Organic Carbon / Total Organic Carbon

The purpose of collecting and analyzing these samples was to confirm the presence or absence of gases or hydrocarbons. Table 1 and Table 2 summarize groundwater and gas sample results, respectively, and the laboratory reports are included in Appendix B. These results did not show detection of dissolved gases or soil vapour gases, and therefore, the core pipe was installed in the borehole at Location 3 to facilitate collection of groundwater and gas samples after the well development and to further confirm presence or absence of hydrocarbons and gases prior to drilling and installing a water source well.

Carbon Drilling completed the core pipe installation. Tetra Tech provided the well design and technical support during the installation. An initial well diagram based on the meeting held between Carbon Drilling, PRRD, and Tetra Tech on November 5, 2024, and the field observations made during the drilling of Location 3 was provided to Carbon Drilling on November 12, 2024 (Tetra Tech 2024b). A monitoring well was planned due to sloughing in the open borehole which restricted the open diameter, making it unable to install a pumping well.

3.3 Well Development

Following the core pipe installation at Location 3, Carbon Drilling developed the well thoroughly using a gas compressor and jetting tool. Tetra Tech provided technical support during the well development. The well development activities were completed to remove fines from the area immediately around the well screen, ensuring hydraulic connection to the aquifer, and that representative groundwater samples are collected, and aquifer properties are obtained during future testing.

The well development started at the top of the screen, working downwards in 6-inch depth increments. Development continued until produced water had less than 5 mL of fines (silt) in a 20 L pail.

The unsuccessful boreholes at Locations 1 and 2 were not developed.

3.4 Groundwater and Gas Sampling

Based on PRRD's request, a groundwater and gas sample were collected from the open borehole at Location 2 on August 20, 2024.

Following well development at Location 3 as described above, and further purging of the well for approximately three wellbore volumes, Carbon Drilling collected another set of groundwater and gas samples on November 20, 2024. Results of the groundwater and gas sample analytical results are summarized in Tables 1 and 2, respectively. The laboratory reports for the analytical results are available in Appendix B.

During sampling, nitrile gloves were worn to prevent cross-contamination during sample collection. Combustible headspace vapour/hydrogen sulfide readings were measured using an RKI Eagle at the surface casing immediately after opening the well and before sample collection.

The collected gas and groundwater samples were analyzed for the same analytical suite as presented in Section 3.2. Groundwater samples for dissolved metals and dissolved organic carbon were field filtered and preserved as per laboratory instructions. Samples were collected in laboratory supplied containers and stored in coolers. The collected samples were stored on ice and were submitted to ALS Laboratory of Fort St. John under standard chain-of-custody (CoC) procedures.

An ambient gas sample was collected by Carbon Drilling at the well head at time of groundwater sampling. The gas sample cannister was positioned at the opening of the well head, the valve was opened for 4 minutes and then closed and submitted for methane and hydrogen sulfide gas analysis to ALS Laboratory of Fort St. John under standard CoC procedures (completion of CoC).

4.0 RESULTS

Three exploratory borehole locations were advanced to total depths ranging from 152.4 m below grade (mbg) to 170.7 mbg. The observed lithology consisted of clay or silt units to depth ranging between approximately 45.5 mbg and 83.0 mbg overlying sandstone, shale or siltstone bedrock units to the maximum drilling depth. The borehole logs for the exploratory boreholes drilled at Locations 1 to 3 are included in Appendix A. Flow testing was recorded at Location 3 to range from 10 gpm at 122 mbg to 27 gpm at 152 mbg.

The core pipe was left in-place to allow for a future installation of a monitoring well if the Regional Board approves the drilling and installation of another well in the vicinity of Location 3. Based on the gas and groundwater sampling results for Location 3, there is no indication as to the presence of H_2S CH_4 gases at this location (Tables 1 and 2), hence this location may be viable for installation and testing of a 152 mm (6-inch) diameter pumping well within a 50 m vicinity of the existing location as per the regulations.

5.0 CONCLUSIONS

The following conclusions can be made based on the collected data from the 2024 Field Program:

- Locations 1 and 2 were deemed capable of producing insufficient quantity and water quality of groundwater and are planned to be abandoned following the regulatory requirements.
- Preliminary estimated flow rates support a productive water well only at Location 3.
- Gas and groundwater samples were collected from the Location 3 borehole and no hydrocarbon and gases were observed.
- The core pipe was left in ground at Location 3 and developed to facilitate the collection of representative gas and groundwater samples and to further confirm presence or absence of hydrocarbons and gases.
- Water quality at Location 3 following well development reported no dissolved H_2S in the groundwater sample. Additionally, there were no sulphur compounds, including H_2S, or methane detected in the soil vapour sample collected. There were a few parameters, which exceeded the Contaminated Sites Regulation drinking water standards (CSR-DW) including dissolved antimony, dissolved lithium and dissolved sodium, and a few total metals. Total and dissolved antimony and total arsenic also exceeded the Guidelines for Canadian Drinking Water Quality (GCDWQ) maximum allowable concentrations, and total aluminum, dissolved and total iron, dissolved and total manganese, and dissolved and total sodium exceeded the aesthetic objectives or operational guidance values of the GCDWQ.

6.0 RECOMMENDATIONS

The analytical results of the gas and groundwater samples did not show presence of gases or hydrocarbons at Location 3. However, it can not be guaranteed that the gases or hydrocarbons will not be observed during long-term pumping at this location.

Based on the findings to date, if PRRD decides to install a water source well at Location 3, Tetra Tech, as described in the Phase 2 plan, recommends aquifer testing in the form of a pumping test to estimate hydraulic parameters of the aquifer. It is recommended that the water source well be drilled within about 50 m of the planned monitoring well borehole and the aquifer testing be comprised of a step rate test, a 72-hour constant-rate pumping test, and testing for groundwater quality. A monitoring well is recommended to be installed in the current borehole with core pipe left in ground.

The water quality should be tested again near the end of the 72-hour constant rate pumping test. The identified exceedances of the water sample collected after well development on November 20, 2024, indicate that the well water would have to be treated at minimum for arsenic and antimony which both exceeded the maximum allowable concentrations of the GCDWQ. Additional water treatment may be required for the parameters that exceeded the aesthetic objectives or operational guidance values of the GCDWQ and CSR-DW standards.

Tetra Tech also recommends abandoning the boreholes drilled at Locations 1 and 2 by backfilling with bentonite chips and/or drill cuttings following the regulatory requirements.

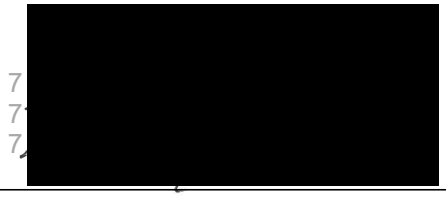
7.0 LIMITATIONS OF REPORT

This report and its contents are intended for the sole use of Peace River Regional District and their agents. Tetra Tech Canada Inc. (Tetra Tech) does not accept any responsibility for the accuracy of any of the data, the analysis, or the recommendations contained or referenced in the report when the report is used or relied upon by any Party other than Peace River Regional District, or for any Project other than the proposed development at the subject site. Any such unauthorized use of this report is at the sole risk of the user. Use of this document is subject to the Limitations on the Use of this Document attached in Appendix C or Contractual Terms and Conditions executed by both parties.

8.0 CLOSURE

We trust this report meets your present requirements. If you have any questions or comments, please contact the undersigned.

Respectfully submitted,
Tetra Tech Canada Inc.



Prepared by:
Thom Kolb, B.Sc., P.Geo.
Hydrogeologist
Environment & Water Practice
Direct Line: 236.983.0195
Thom.Kolb@tetratech.com

Reviewed by:
Aziz Shaikh, M.Sc., P.Eng.
Principal Hydrogeologist
Environment & Water Practice
Direct Line: 403.899.7064
Aziz.Shaikh@tetratech.com

/jmt

Attachments: Tables (2)
Figure (1)
Appendix A – Borehole Logs
Appendix B – Laboratory Reports
Appendix C – Tetra Tech's Limitations on the Use of this Document

PERMIT TO PRACTICE
TETRA TECH CANADA INC.
PERMIT NUMBER: 1001972

REFERENCES

Government of British Columbia (Government of B.C.) 2022, Water Sustainability Act, Groundwater Protection Regulation, B.C. Reg 39/2016. Deposited and effective February 29, 2016. Last amended December 1, 2022 by B.C. Reg 253/2022. Consolidation current to Many 23, 2023.

Tetra Tech Canada Inc (Tetra Tech) 2024a. Hydrogeological Desktop Assessment. Submitted to Peace River Regional District April 30, 2024.

Tetra Tech Canada Inc (Tetra Tech) 2024b. 2024 Well Completion Work Plan. Submitted to Peace River Regional District November 12, 2024.

TABLES

Table 1 Groundwater Analytical Results
Table 2 Soil Vapor Analytical Results

Table 1: Groundwater Analytical Results

				Location Code	Location 2	Location 3	
				Field ID	Location 2	Location 3	Location 3
				Date	20 Aug 2024	09 Sep 2024	20 Nov 2024
				Lab Report Number	FJ2402491	FJ2402712	FJ2403536
				Sample Code	FJ2402491-001	FJ2402712-001	FJ2403536-001
Parameter	**Unit**	**GCDWQ**		**CSR - DW**			
		MAC	**OV**				
Physical Parameters							
pH	pH Units	-	7 - 10.5	-	7.99	8.39	8.34
Electrical Conductivity (EC)	µS/cm	-	-	-	975	1,800	1,890
Total Dissolved Solids (TDS)	µg/L	-	500,000	-	**906,000**	**1,340,000**	**1,230,000**
Turbidity	NTU	-	1	-	**>4,000**	**316**	**26**
Hardness as $CaCO_3$	µg/L	-	-	-	227,000	350,000	251,000
Hardness as $CaCO_3$ (filtered)	µg/L	-	-	-	41,200	353,000	238,000
Alkalinity (total as $CaCO_3$)	µg/L	-	-	-	534,000	882,000	946,000
Alkalinity (pp as $CaCO_3$)	µg/L	-	-	-	<1,000	10,400	6,700
Alkalinity (Bicarbonate as $CaCO_3$)	µg/L	-	-	-	534,000	861,000	933,000
Alkalinity (Carbonate as $CaCO_3$)	µg/L	-	-	-	<1,000	20,800	13,300
Alkalinity (Hydroxide) as $CaCO_3$	µg/L	-	-	-	<1,000	<1,000	<1,000
Bromide	µg/L	-	-	-	<250	<500	<500
Chloride	µg/L	-	250,000	250,000	19,000	38,800	38,600
Fluoride	µg/L	1,500	-	1,500	478	<200	629
Sulphate	µg/L	-	500,000	500,000	12,700	136,000	120,000
Sulphide	µg/L	-	-	-	350	<10	<10
Sulphide (as H_2S)	µg/L	-	50	50	**372**	<11	<11
Colour, True	Col. Unit	-	15	-	5.8	<5.0	<5.0
UV Absorbance @ 254nm	AU/cm	-	-	-	0.141	0.062	0.083
Transmittance, UV (@ 254nm)	% T/cm	-	-	-	72.3	86.7	82.6
Carbon							
Dissolved Organic Carbon (DOC)	µg/L	-	-	-	27,500	3,370	4,000
Total Organic Carbon (TOC)	µg/L	4,000	-	-	**101,000**	**7,250**	3,740
Cyanide							
Cyanide Total	µg/L	200	-	200	<5.0	<5.0	<5.0
Gases							
Methane	µg/L	-	-	-	10.5	<5.0	-
Methane	ppmv	-	-	-	43,600	-	-
Nutrients							
Nitrate (as N)	µg/L	10,000	-	10,000	41.2	<50.0	<50.0
Nitrite (as N)	ug/L	1,000	-	1,000	<5.0	<10.0	<10.0
Dissolved Metals							
Aluminum	µg/L	2,900	100	9,500	**136**	7.8	2.7
Antimony	µg/L	6	-	6	2.06	0.91	**6.71**
Arsenic	µg/L	10	-	10	1.14	0.9	6.23
Barium	µg/L	2,000	-	1,000	352	48.3	418
Beryllium	µg/L	-	-	8	<0.100	<0.100	<0.100
Bismuth	µg/L	-	-	-	<0.050	<0.050	<0.100
Boron	µg/L	5,000	-	5,000	240	371	329
Cadmium	µg/L	7	-	5	0.0186	0.0304	0.0734
Calcium	µg/L	-	-	-	7,600	62,600	38,900
Chromium	µg/L	50	-	50	<0.50	<0.50	<1.00
Cesium	µg/L	-	-	-	0.057	0.053	0.078
Cobalt	µg/L	-	-	1	0.42	0.48	1.74
Copper	µg/L	2,000	1,000	1,500	0.53	<0.20	0.55
Iron	µg/L	-	300	6,500	174	178	787
Lead	µg/L	5	-	10	0.073	<0.050	<0.100
Lithium	µg/L	-	-	8	6.8	20.6	14.1
Magnesium	µg/L	-	-	-	5,390	47,700	34,200
Manganese	µg/L	120	20	1,500	**141**	**110**	**112**
Mercury	µg/L	1	-	1	<0.0050	<0.0050	<0.0050
Molybdenum	µg/L	-	-	250	19.2	3.92	30.4
Nickel	µg/L	-	-	80	3.47	1.52	11.1
Phosphorus	µg/L	-	-	-	<50	<50	<100
Potassium	µg/L	-	-	-	5,180	4,400	3,390
Rubidium	µg/L	-	-	-	1.88	2.4	2.38
Selenium	µg/L	50	-	10	0.941	1.76	3.01
Silicon	µg/L	-	-	-	2,040	4,860	4,070
Silver	µg/L	-	-	20	<0.010	<0.010	<0.020
Sodium	µg/L	-	200,000	200,000	**244,000**	**360,000**	**401,000**
Strontium	µg/L	7,000	-	2,500	150	994	598
Sulphur	µg/L	-	-	-	11,000	51,000	42,800
Tellurium	µg/L	-	-	-	<0.20	<0.20	<0.40
Thallium	µg/L	-	-	-	<0.010	<0.010	0.023
Thorium	µg/L	-	-	-	<0.10	<0.10	<0.20
Tin	µg/L	-	-	2,500	<0.10	<0.10	<0.20
Titanium	µg/L	-	-	-	5.27	<0.30	<0.60
Tungsten	µg/L	-	-	3	<0.10	<0.10	0.3
Uranium	µg/L	20	-	20	2.63	1.41	6.24
Vanadium	µg/L	-	-	20	0.59	<0.50	<1.00
Zinc	µg/L	-	5,000	3,000	2	2.2	4.3
Zirconium	µg/L	-	-	-	<0.20	0.35	0.41
Total Metals							
Aluminum	µg/L	2,900	100	9,500	**72,300**	**3,140**	**165**
Antimony	µg/L	6	-	6	1.68	0.99	**6.96**
Arsenic	µg/L	10	-	10	**32.5**	3.62	**21.4**
Barium	µg/L	2,000	-	1,000	**9,270**	206	467
Beryllium	µg/L	-	-	8	5.83	0.213	<0.100
Bismuth	µg/L	-	-	-	1.36	<0.100	<0.100
Boron	µg/L	5,000	-	5,000	284	319	352
Cadmium	µg/L	7	-	5	**14.7**	0.318	0.116
Calcium	µg/L	-	-	-	32,500	55,300	41,000
Chromium	µg/L	50	-	50	**194**	8.17	<1.00

Table 1: Groundwater Analytical Results

				Location Code	Location 2	Location 3	
				Field ID	Location 2	Location 3	Location 3
				Date	20 Aug 2024	09 Sep 2024	20 Nov 2024
				Lab Report Number	FJ2402491	FJ2402712	FJ2403536
				Sample Code	FJ2402491-001	FJ2402712-001	FJ2403536-001
Parameter	**Unit**	**GCDWQ**		**CSR - DW**			
		MAC	**OV**				
Cesium	µg/L	-	-	-	16.1	1.53	0.125
Cobalt	µg/L	-	-	1	89.1	3.41	1.9
Copper	µg/L	2,000	1,000	1,500	295	13.4	2.64
Iron	µg/L	-	300	6,500	**274000**	**18,800**	**3,170**
Lead	µg/L	5	-	10	**102**	**5.62**	0.556
Lithium	µg/L	-	-	8	119	22.8	15.4
Magnesium	µg/L	-	-	-	35,500	51,400	36,200
Manganese	µg/L	120	20	1,500	**4,590**	**251**	**115**
Mercury	µg/L	1	-	1	**1.43**	0.0608	<0.0050
Molybdenum	µg/L	-	-	250	9.22	3.97	33.5
Nickel	µg/L	-	-	80	328	12	11.9
Phosphorus	µg/L	-	-	-	4,070	140	<100
Potassium	µg/L	-	-	-	14,400	4,600	3,390
Rubidium	µg/L	-	-	-	97.2	9.91	2.7
Selenium	µg/L	50	-	10	4.38	1.9	3.15
Silicon	µg/L	-	-	-	87,200	10,000	4,680
Silver	µg/L	-	-	20	3.59	0.122	<0.020
Sodium	µg/L	-	200,000	200,000	**232,000**	**362,000**	**395,000**
Strontium	µg/L	7,000	-	2,500	528	1,040	665
Sulphur	µg/L	-	-	-	14,000	57,800	48,800
Tellurium	µg/L	-	-	-	<1.00	<0.40	<0.40
Thallium	µg/L	-	-	-	1.35	0.088	0.028
Thorium	µg/L	-	-	-	34.8	1.5	<0.20
Tin	µg/L	-	-	2,500	<0.50	<0.20	<0.20
Titanium	µg/L	-	-	-	107	18.7	5.54
Tungsten	µg/L	-	-	3	<0.50	<0.20	0.33
Uranium	µg/L	20	-	20	10.7	1.79	6.95
Vanadium	µg/L	-	-	20	233	11.8	1.27
Zinc	µg/L	-	5,000	3,000	1,030	76.7	9.2
Zirconium	µg/L	-	-	-	<1.00	<0.40	0.64
BTEXS & MTBE							
Benzene	µg/L	5	-	5	-	<0.50	-
Toluene	µg/L	60	24	60	-	<0.50	-
Ethylbenzene	µg/L	140	1.6	140	-	<0.50	-
Xylenes (m & p)	µg/L	-	-	-	-	<0.40	-
Xylene (o)	µg/L	-	-	-	-	<0.30	-
Xylenes Total	µg/L	90	20	90	-	<0.50	-
Styrene	µg/L	-	-	800	-	<0.50	-
Methyl t-butyl ether (MTBE)	µg/L	-	15	95	-	<0.50	-
Hydrocarbons							
F1 (C_6-C_{10})	µg/L	-	-	-	-	<100	-
F1 (C_6-C_{10}) less BTEX	µg/L	-	-	-	-	<100	-
Volatile Hydrocarbons							
VHs (C_6-C_{10})	ug/L	-	-	-	-	<100	-
VPHw	µg/L	-	-	-	-	<100	-

Notes:

CSR	Environmental Management Act (EMA). 2023. Contaminated Sites Regulation (CSR), B.C. Reg. 375/96, deposited 1996/12/16, O.C. 1480/96, effective 1997/04/01 (including amendments up to B.C. Reg. 133/2022, effective March 1, 2023). Schedule 3.2
DW	Drinking Water Standards
GCDWQ	Health Canada. 2022. Guidelines for Canadian Drinking Water Quality Summary Table.
MAC	Maximum Allowable Concentration.
OV	Other Value refers to the aesthetic objectives of operational guidance values according to the GCDWQ criteria.
Bold Underlined	Bold underlined indicates an exceedance of one or more GCDWQ standards.
Shaded	Shaded indicates an exceedance of the applicable CSR DW standards.

Table 2: Soil Vapour Analytical Results

		Location Code	Location 2	Location 3	
		Field ID	Location 2	Location 3	Location 3
		Date	23 Aug 2024	09 Sep 2024	20 Nov 2024
		Lab Report Number	FJ2402552	FJ2402713	FJ2403535
		Sample Code	FJ2402552-001	FJ2402713-001	FJ2403535-001
Parameter	**Unit**	**CSR - RL**			
Physical Parameters					
Pressure on receipt	Inches Hg	-	-8.17	-2.05	-6.13
Gases					
Methane	%	-	<0.050	<0.050	<0.050
Sulfur Compounds/Volatile Organic Compounds (VOCs)					
1-Butyl mercaptan	ppbv	-	<4.0	<4.0	<4.0
	µg/m3	-	<15	<15	<15
Carbon disulfide	ppbv	-	45.7	<2.0	<2.0
	µg/m3	700	142	<6.2	<6.2
Carbonyl Sulphide	ppbv	-	247	9.6	<4.0
	µg/m3	-	607	24	<10
Diethyl Disulfide	ug/m3	-	<10	<10	<10
	ppbv	-	<2.0	<2.0	<2.0
Diethyl sulphide	ppbv	-	<4.0	<4.0	<4.0
	µg/m3	-	<15	<15	<15
Dimethyl Disulphide	ppbv	-	<2.0	<2.0	<2.0
	mg/m3	-	<0.0077	<0.0077	<0.0077
Dimethyl Sulfide	ppbv	-	<4.0	<4.0	<4.0
	µg/m3	-	<10	<10	<10
Dimethylthiophene, 2,5-	ppbv	-	<4.0	<4.0	<4.0
	ug/m3	-	<18	<18	<18
Ethyl Mercaptan	ppbv	-	<4.0	<4.0	<4.0
	µg/m3	-	<10	<10	<10
Ethyl Methyl Sulfide	ug/m3	-	<12	<12	<12
	ppbv	-	<4.0	<4.0	<4.0
Ethylthiophene, 2-	ppbv	-	<4.0	<4.0	<4.0
	ug/m3	-	<18	<18	<18
Hydrogen sulfide	ppbv	-	13.5	<4.0	<4.0
	µg/m3	-	18.8	<5.6	<5.6
iso-Butyl mercaptan	ppbv	-	<4.0	<12	<4.0
	ug/m3	-	<15	<4.0	<15
Isopropyl Mercaptan	ug/m3	-	<12	<4.0	<12
	ppbv	-	<4.0	<15	<4.0
Methyl Mercaptan	ppbv	-	<4.0	<4.0	<4.0
	µg/m3	2	<7.9	<7.9	<7.9
1-Propanethiol	ppbv	-	<4.0	<4.0	<4.0
	µg/m3	-	<12	<12	<12
Methylthiophene, 2-	ppbv	-	<4.0	<4.0	<4.0
	ug/m3	-	<16	<16	<16
Methylthiophene, 3-	ppbv	-	<4.0	<4.0	<4.0
	ug/m3	-	<16	<16	<16
sec-Butyl Mercaptan + Thiophene	ppbv	-	<6.0	<6.0	<6.0
	ug/m3	-	<21	<21	<21
Sulfur, total reduced (as H2S), 10 compounds	ug/m3	-	427	<16	<16
Sulfur, total reduced (as H2S), 22 compounds	ug/m3	-	427	<25	<25
Sulfur, total reduced (as H2S), NPRI 6	ug/m3	-	427	13	<12
Sulfur, total reduced (as H2S), Ontario 4	ug/m3	-	19	<11	<11
t-Butyl mercaptan	ppbv	-	<4.0	<4.0	<4.0
	ug/m3	-	<15	<15	<15
tetrahydrothiophene	ppbv	-	<4.0	<4.0	<4.0
	µg/m3	-	<14	<14	<14

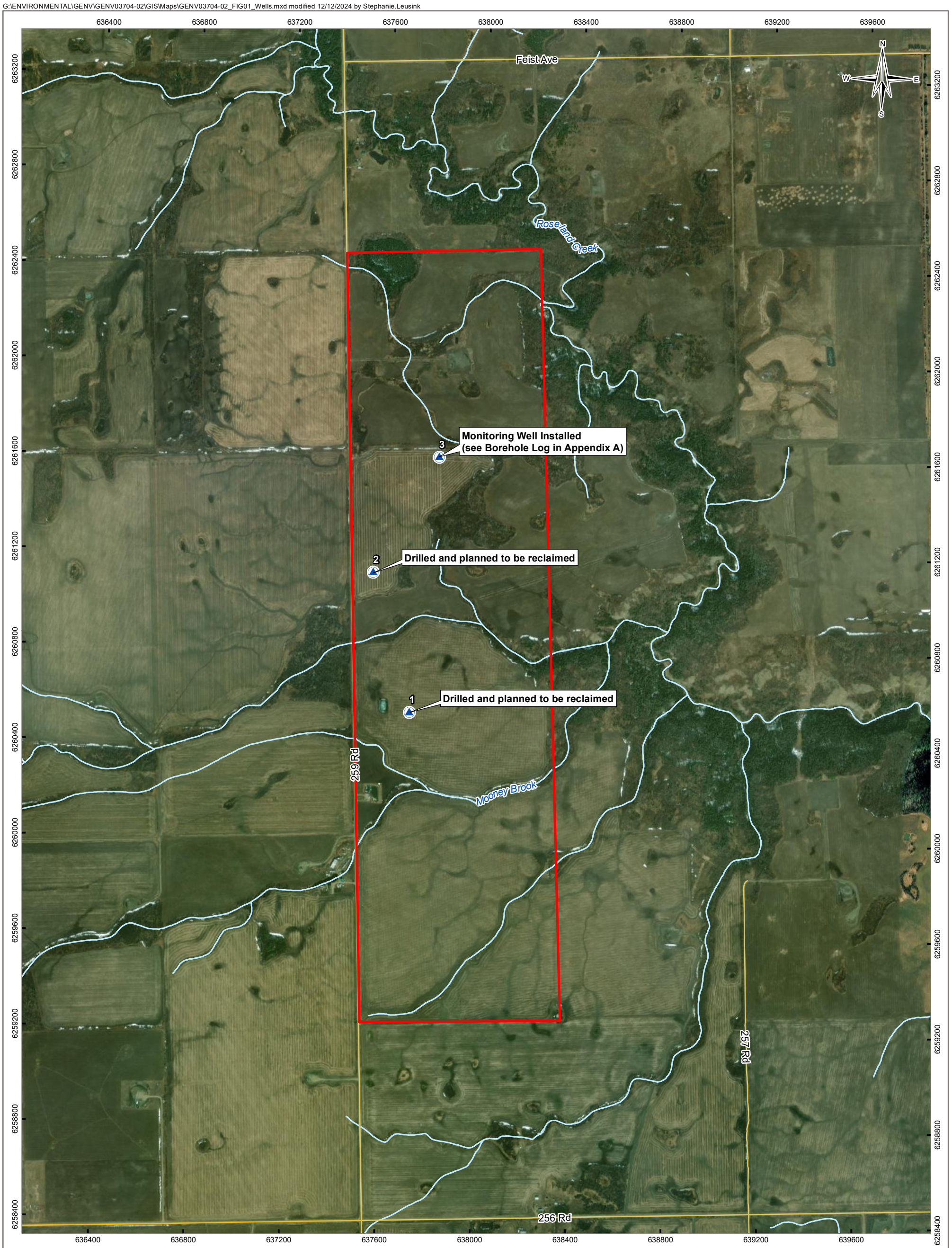
Notes:

CSR	Environmental Management Act (EMA). 2023. Contaminated Sites Regulation (CSR), B.C. Reg. 375/96, deposited 1996/12/16, O.C. 1480/96, effective 1997/04/01 (including amendments up to B.C. Reg. 133/2022, effective March 1, 2023). Schedule 3.3
RL	Residential Land Use
Shaded	Shaded indicates an exceedance of the CSR Schedule standards prior to applying applicable attenuation factors.

FIGURES

Figure 1 Water Well Drilling Locations & Order of Preference

G:\ENVIRONMENTAL\GENV\GENV03704-02\GIS\Maps\GENV03704-02_FIG01_Wells.mxd modified 12/12/2024 by Stephanie.Leusink



LEGEND

- Water Well Drilling Location (labelled with order of preference)
- Permitted Drilling Area

Base Data

- Main Road
- Local Road
- Watercourse

NOTES
Imagery: ESRI, Maxar (2023)

STATUS
ISSUED FOR USE

PRRD HYDROGEOLOGICAL ASSESSMENT PHASE 2

Water Well Drilling Locations & Order of Preference

PROJECTION UTM Zone 10			**DATUM** NAD83	**CLIENT** Peace River Regional District
Scale: 1:15,000 — 300 150 0 300 — Metres				TETRA TECH
FILE NO. GENV03704-02_FIG01_Wells.mxd				
OFFICE Tt-VANC	**DWN** SL	**CKD** BB	**APVD** AM	**REV** 0
DATE December 12, 2024	**PROJECT NO.** ENW.GENV03704-02			**Figure 1**

APPENDIX A

BOREHOLE LOGS

Peace River Regional District

Borehole No: **Location 1**

Project: Rose Prairie Water Well Drilling & Pump Test	Project No: ENW.GENV03704-02
Location:	
Rose Prairie, British Columbia	

Depth (m)	Method	Soil Description	Notes and Comments	Depth (ft)
0				0
	Air rotary	CLAY - massive, dry, firm, low plastic, dark grey, some iron oxidation		
5				10
				20
10		- trace gravel, angular gravel to 5 mm diameter		30
				40
15		SILT - clayey, trace to some gravel, angular gravel to 5 mm diameter, massive, sticky, dry, firm, low plastic, grey, trace iron oxides		50
		CLAY - trace gravel, angular gravel to 10 mm diameter, massive, very sticky, moist, medium plastic, grey, 2 mm thick brownish yellow clay lenses		60
20				70
				80
25		- some gravel, sticky, firm		90
				100
30		- trace gravel		110
35				120
		- dry, low plastic, dark grey		130
40				140
		- homogeneous, gravel to 5 mm diameter, dense		150
45				160
		SANDSTONE (BEDROCK) - coarse grained sandstone, dark grey		
50				

TETRA TECH

Contractor: Carbon Mountain Drilling	Completion Depth: 170.7 m
Equipment Type: Truck mounted RC	Start Date: 2024 August 12
Logged By: FN	Completion Date: 2024 August 19
Reviewed By:	Page 1 of 4

Peace River Regional District

Borehole No: **Location 1**

Project: Rose Prairie Water Well Drilling & Pump Test	Project No: ENW.GENV03704-02
Location:	
Rose Prairie, British Columbia	

Depth (m)	Method	Soil Description	Notes and Comments	Depth (ft)
50				170
		SHALE (BEDROCK) - brittle, hard, black, interbedded yellowish brown sand		
55				180
				190
60				200
		- softer, dark greyish brown, no visible inclusions		210
65				
		SANDSTONE (BEDROCK) - soft, brownish yellow, intermixed with clay - sticky, low plastic, grey		220
70				230
	Air rotary	SHALE (BEDROCK) - trace sand, coarse grained white sand, brittle, black, intermixed with siltstone - firm, hard, grey, intermixed with sandstone - loose, yellowish brown		240
75				250
		SILTSTONE (BEDROCK) - firm to hard, dense, dark grey, intermixed with clay - sticky, soft		260
80				270
		SHALE (BEDROCK) - brittle, hard, dark grey, intermixed with sticky clay		280
85				290
90				300
		SANDSTONE (BEDROCK) - soft, light brown, intermixed with shale - brittle, platy, firm to hard, dark greyish black		310
95				
		- fine grained sandstone, very hard, grey, no visible intermix		320
100				

TETRA TECH

Contractor: Carbon Mountain Drilling	Completion Depth: 170.7 m
Equipment Type: Truck mounted RC	Start Date: 2024 August 12
Logged By: FN	Completion Date: 2024 August 19
Reviewed By:	Page 2 of 4

Peace River Regional District

Borehole No: **Location 1**

Project: Rose Prairie Water Well Drilling & Pump Test	Project No: ENW.GENV03704-02
Location:	
Rose Prairie, British Columbia	

Depth (m)	Method	Soil Description	Notes and Comments	Depth (ft)
100				330
105	Air rotary	- dark grey		340
				350
110		SAND - trace gravel, coarse grained sand, subangular gravel to 10 mm diameter, dry, loose, grey		360
				370
115		SHALE (BEDROCK) - brittle, firm, dark grey		380
		SANDSTONE (BEDROCK) - stiff, compacted, dark grey		390
120				400
		SHALE (BEDROCK) - brittle, platy, firm, dark greyish black		410
125		SANDSTONE (BEDROCK) - broken to subrounded chunks to 10 mm diameter, very stiff to hard, dark grey		420
130				430
				440
135				450
		SHALE (BEDROCK) - brittle, platy, sticky, firm, dark greyish black		460
140		- compact, very hard		470
				480
145		SANDSTONE (BEDROCK) - coarse grained sandstone, extremely hard, light grey, salt and pepper (white, grey and black)		490
150				

TETRA TECH

Contractor: Carbon Mountain Drilling	Completion Depth: 170.7 m
Equipment Type: Truck mounted RC	Start Date: 2024 August 12
Logged By: FN	Completion Date: 2024 August 19
Reviewed By:	Page 3 of 4

Peace River Regional District

Borehole No: **Location 1**

Project: Rose Prairie Water Well Drilling & Pump Test	Project No: ENW.GENV03704-02
Location:	
Rose Prairie, British Columbia	

Depth (m)	Method	Soil Description	Notes and Comments	Depth (ft)
150				
	Air rotary	- fine grained sandstone, dark grey		
		SHALE (BEDROCK) - brittle, platy, soft, dark grey		
155				500
				510
				520
160		SHALE AND SANDSTONE (BEDROCK) - intermixed, harder		530
		SANDSTONE - trace soft shale, fine grained sandstone, gritty, soft, light grey		
165				540
		- hard, limited recovery		550
170				
		END OF BOREHOLE (170.7 metres)		560
				570
175				580
				590
180				600
				610
185				620
				630
190				640
				650
195				
200				

TETRA TECH

Contractor: Carbon Mountain Drilling	Completion Depth: 170.7 m
Equipment Type: Truck mounted RC	Start Date: 2024 August 12
Logged By: FN	Completion Date: 2024 August 19
Reviewed By:	Page 4 of 4

Peace River Regional District

Borehole No: **Location 2**

Project: Rose Prairie Water Well Drilling & Pump Test	Project No: ENW.GENV03704-02
Location:	
Rose Prairie, British Columbia	

Depth (m)	Method	Soil Description	Notes and Comments	Depth (ft)
0				0
	Air rotary	CLAY - massive, dry, stiff, low plastic, dark grey, iron oxides, trace white fine grained material		
5				10
				20
10				30
		- angular gravel to 10 mm diameter, sticky		40
15		- hard boulder approximately 300 mm thick, gravel to 50 mm diameter		50
		- some gravel, angular gravel to 10 mm dimeter, moist, firm, intermixed with dark brown sand lenses		60
20				70
		- gravel to 5 mm diameter, medium plastic		80
25				90
		- sandy, low plastic, dark brown sand		100
30				110
		- trace sand, soft		120
35				130
		- silty, sandy, medium plastic		140
40				150
		SAND - coarse grained sand, wet, loose, intermixed with clay - trace gravel, low plastic		160
45				
		CLAY - trace gravel, moist, dense, low plastic, dark grey, intermixed with silt and fine grained sand		
50				

TETRA TECH

Contractor: Carbon Mountain Drilling	Completion Depth: 152.4 m
Equipment Type: Truck mounted RC	Start Date: 2024 August 15
Logged By: FN	Completion Date: 2024 August 17
Reviewed By:	Page 1 of 4

Peace River Regional District

Borehole No: **Location 2**

Project: Rose Prairie Water Well Drilling & Pump Test	Project No: ENW.GENV03704-02
Location:	
Rose Prairie, British Columbia	

Depth (m)	Method	Soil Description	Notes and Comments	Depth (ft)
50				170
55	Air rotary	SHALE (BEDROCK) - fissile, soft, low plastic, dark grey to black, dark brown sand layers		180
				190
60		- dry, very dense, dark grey, no visible sand, silt or gravel		200
65				210
				220
70		- angular gravel to 20 mm diameter for 300 mm - trace sand, trace gravel, coarse grained sand, gravel to 5 mm diameter, sticky, dark grey to black		230
				240
75				250
				260
80				270
85				280
				290
90				300
		SANDSTONE (BEDROCK) - angular gravel to 7 mm diameter, hard, dark grey SHALE (BEDROCK) - angular gravel to 7 mm diameter, fissile, dry, very dense, dark grey		
95		SANDSTONE (BEDROCK) - coarse grained sandstone, very hard, dark grey		310
		SHALE (BEDROCK) - fissile, dry, very dense, low plastic, dark grey to black, intermixed with fine grained brown sand		320
100				

TETRA TECH

Contractor: Carbon Mountain Drilling	Completion Depth: 152.4 m
Equipment Type: Truck mounted RC	Start Date: 2024 August 15
Logged By: FN	Completion Date: 2024 August 17
Reviewed By:	Page 2 of 4

Peace River Regional District

Borehole No: **Location 2**

Project: Rose Prairie Water Well Drilling & Pump Test	Project No: ENW.GENV03704-02
Location:	
Rose Prairie, British Columbia	

Depth (m)	Method	Soil Description	Notes and Comments	Depth (ft)
100				
		SANDSTONE (BEDROCK) - well graded, hard, grey		330
		SHALE (BEDROCK) - sticky, hard, low plastic, dark grey to dark brown, intermixed with dark brown sand		340
105				350
		SANDSTONE (BEDROCK) - hard, dark brown		360
110				370
115				380
			Note: Circulation lost, stratigraphy estimated based of Driller interpretation	390
120				400
125	Air rotary			410
				420
130		- non sticky, soft		430
				440
135		- harder		450
				460
140				470
145				480
150				490

TETRA TECH

Contractor: Carbon Mountain Drilling	Completion Depth: 152.4 m
Equipment Type: Truck mounted RC	Start Date: 2024 August 15
Logged By: FN	Completion Date: 2024 August 17
Reviewed By:	Page 3 of 4

Peace River Regional District

Borehole No: **Location 2**

Project: Rose Prairie Water Well Drilling & Pump Test	Project No: ENW.GENV03704-02
Location:	
Rose Prairie, British Columbia	

Depth (m)	Method	Soil Description	Notes and Comments	Depth (ft)
150				500
		END OF BOREHOLE (152.4 metres)		
155				510
160				520
165				530
170				540
175				550
180				560
185				570
190				580
195				590
200				600
				610
				620
				630
				640
				650

TETRA TECH

Contractor: Carbon Mountain Drilling	Completion Depth: 152.4 m
Equipment Type: Truck mounted RC	Start Date: 2024 August 15
Logged By: FN	Completion Date: 2024 August 17
Reviewed By:	Page 4 of 4

Peace River Regional District

Borehole No: **Location 3**

Project: Rose Prairie Water Well Drilling & Pump Test	Project No: ENW.GENV03704-02
Location:	
Rose Prairie, British Columbia	

Depth (m)	Method	Soil Description	Sample Type	VOC / H2S	Notes and Comments	Monitoring well	Depth (ft)
0				VOC 5 10 15 20; H2S 1 2 3 4			0
	Air rotary	CLAY - trace organics, trace gravel, homogeneous, subangular gravel to 20 mm diameter, moist, firm, medium plastic, light brown			51 mm diameter PVC pipe	1.0 m stickup	
5		- boulder					10
10							20
							30
							40
15		- no visible organics, soft to firm, grey					50
							60
20		- fine to coarse grained gravel					70
							80
25		- firm					90
							100
30		- trace to some gravel, trace silt, high plastic					110
35							120
							130
40						168 mm steel drill casing	
		- increased silt, medium plastic					140
45							150
							160
50							

TETRA TECH

Contractor: Carbon Mountain Drilling	Completion Depth: 158.5 m
Equipment Type: Truck mounted RC	Start Date: 2024 September 4
Logged By: TK	Completion Date: 2024 September 7
Reviewed By:	Page 1 of 4

Peace River Regional District

Borehole No: **Location 3**

Project: Rose Prairie Water Well Drilling & Pump Test	Project No: ENW.GENV03704-02
Location:	
Rose Prairie, British Columbia	

Depth (m)	Method	Soil Description	Sample Type	VOC / H2S	Notes and Comments	Monitoring well	Depth (ft)
50				VOC 5 10 15 20; H2S 1 2 3 4			170
55		- no visible gravel					180
60							190
65							200
70		- stiff					210
75	Air rotary						220
80							230
		SANDSTONE (BEDROCK) - fine to medium grained sandstone					240
85		SHALE (BEDROCK) - weak, brown				84.4 m, bottom of steel drill casing	250
90							260
							270
95		SANDSTONE AND SHALE (BEDROCK) - interlayered, fine to medium grained sandstone					280
100							290
							300
							310
							320

TETRA TECH

Contractor: Carbon Mountain Drilling	Completion Depth: 158.5 m
Equipment Type: Truck mounted RC	Start Date: 2024 September 4
Logged By: TK	Completion Date: 2024 September 7
Reviewed By:	Page 2 of 4

Peace River Regional District

Borehole No: **Location 3**

Project: Rose Prairie Water Well Drilling & Pump Test	Project No: ENW.GENV03704-02
Location:	
Rose Prairie, British Columbia	

Depth (m)	Method	Soil Description	Sample Type	VOC / H2S	Notes and Comments	Monitoring well	Depth (ft)
100				VOC 5 10 15 20; H2S 1 2 3 4			330
		- weak, brownish grey					340
105							350
110							360
							370
115		SANDSTONE (BEDROCK) - greyish black, some shale lenses					380
							390
120		- some shale, weathered, weak, H2S odour observed from 121.92 metres on					400
125	Air rotary						410
		SHALE (BEDROCK) - weak, grey				128.0 m, shale trap	420
130							430
		SANDSTONE (BEDROCK) - medium to coarse grained sandstone					440
135		- harder				Filter pack 0.020" slot size (20 slot)	450
		SHALE (BEDROCK) - weak, dark grey, intermixed fine grained sandstone					460
140							470
							480
145		- some fine grained sandstone, dense				146.3 m, shale trap	
150							490

TETRA TECH

Contractor: Carbon Mountain Drilling	Completion Depth: 158.5 m
Equipment Type: Truck mounted RC	Start Date: 2024 September 4
Logged By: TK	Completion Date: 2024 September 7
Reviewed By:	Page 3 of 4

Peace River Regional District

Borehole No: **Location 3**

Project: Rose Prairie Water Well Drilling & Pump Test	Project No: ENW.GENV03704-02
Location:	
Rose Prairie, British Columbia	

Depth (m)	Method	Soil Description	Sample Type	VOC / H2S	Notes and Comments	Monitoring well	Depth (ft)
150				VOC: 5 10 15 20; H2S: 1 2 3 4			
155	Air rotary					Pea gravel	500 510
158.5		END OF BOREHOLE (158.5 metres) Monitoring well installed to 146.3 metres				158.5 m	520
160							530
165							540
170							550 560
175							570
180							580 590
185							600
190							610 620
195							630 640
200							650

TETRA TECH

Contractor: Carbon Mountain Drilling	Completion Depth: 158.5 m
Equipment Type: Truck mounted RC	Start Date: 2024 September 4
Logged By: TK	Completion Date: 2024 September 7
Reviewed By:	Page 4 of 4

ENV-DETAILED WELL ENW-GENV03704-02.GPJ EBA.GDT 24-12-12

APPENDIX B

LABORATORY REPORTS

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2402491**	Page	: 1 of 7
Client	: **Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Fort St. John
Contact	: Andrea McMillan	Account Manager	: Wendy Sears
Address	: 110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: ----	Telephone	: +1 250 261 5517
Project	: 704.ENV.GENV 03704-02	Date Samples Received	: 21-Aug-2024 09:00
PO	: ----	Date Analysis Commenced	: 22-Aug-2024
C-O-C number	: 20-964332	Issue Date	: 26-Aug-2024 18:23
Sampler	: Fahim Nazari		
Site	: ----		
Quote number	: VA24-EBAE100-013		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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*
Andrea Armstrong	Department Manager - Air Quality and Volatiles	Air Quality, Waterloo, Ontario
Angela Ren	Team Leader - Metals	Metals, Burnaby, British Columbia
Ilnaz Badbezanchi	Supervisor - Metals Prep & Mercury	Metals, Burnaby, British Columbia
Kate Dimitrova	Supervisor - Inorganic	Inorganics, Burnaby, British Columbia
Manpreet Cheema	Lab Assistant	Metals, Burnaby, British Columbia
Maya Urquhart	Lab Analyst	Metals, Burnaby, British Columbia
Owen Cheng		Metals, Burnaby, British Columbia

General Comments

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

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

Where the LOR of a reported result differs from standard LOR, this may be due to high moisture content, insufficient sample (reduced weight employed) or matrix interference.
Please refer to Quality Control Interpretive report (QCI) for information regarding Holding Time compliance.

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

Unit	*Description*
-	no units
% T/cm	% transmittance per centimetre
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre
AU/cm	absorbance units per centimetre
CU	colour units (1 cu = 1 mg/l pt)
mg/L	milligrams per litre
NTU	nephelometric turbidity units
pH units	pH units
ppmv	parts per million (volume/volume)

<: 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.

Qualifiers

Qualifier	*Description*
DLA	*Detection Limit adjusted for required dilution.*
DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*
DTMF	*Dissolved concentration exceeds total for field-filtered metals sample. Metallic contaminants may have been introduced to dissolved sample during field filtration.*

Analytical Results

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

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: Location 2	----	----	----	----
					Client sampling date / time: 20-Aug-2024 17:00	----	----	----	----
					FJ2402491-001	--------	--------	--------	--------
					Result	----	----	----	----
Physical Tests									
Absorbance, UV (@ 254nm)	----	E404/VA	0.0050	AU/cm	0.141	----	----	----	----
Alkalinity, bicarbonate (as CaCO3)	----	E290/VA	1.0	mg/L	534	----	----	----	----
Alkalinity, carbonate (as CaCO3)	----	E290/VA	1.0	mg/L	<1.0	----	----	----	----
Alkalinity, hydroxide (as CaCO3)	----	E290/VA	1.0	mg/L	<1.0	----	----	----	----
Alkalinity, phenolphthalein (as CaCO3)	----	E290/VA	1.0	mg/L	<1.0	----	----	----	----
Alkalinity, total (as CaCO3)	----	E290/VA	1.0	mg/L	534	----	----	----	----
Colour, true	----	E329/VA	5.0	CU	5.8	----	----	----	----
Conductivity	----	E100/VA	2.0	µS/cm	975	----	----	----	----
Hardness (as CaCO3), dissolved	----	EC100/VA	0.60	mg/L	41.2	----	----	----	----
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/VA	0.60	mg/L	227	----	----	----	----
pH	----	E108/VA	0.10	pH units	7.99	----	----	----	----
Solids, total dissolved [TDS]	----	E162/VA	10	mg/L	906	----	----	----	----
Turbidity	----	E121/VA	0.10	NTU	>4000	----	----	----	----
Transmittance, UV (@ 254nm)	----	E404/VA	1.0	% T/cm	72.3	----	----	----	----
Anions and Nutrients									
Bromide	24959-67-9	E235.Br-L/VA	0.050	mg/L	<0.250 DLDS	----	----	----	----
Chloride	16887-00-6	E235.Cl/VA	0.50	mg/L	19.0	----	----	----	----
Fluoride	16984-48-8	E235.F/VA	0.020	mg/L	0.478	----	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	0.0050	mg/L	0.0412	----	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	0.0010	mg/L	<0.0050 DLDS	----	----	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/VA	0.30	mg/L	12.7	----	----	----	----
Cyanides									
Cyanide, strong acid dissociable (Total)	----	E333/VA	0.0050	mg/L	<0.0050	----	----	----	----
Organic / Inorganic Carbon									
Carbon, dissolved organic [DOC]	----	E358-L/VA	0.50	mg/L	27.5	----	----	----	----
Carbon, total organic [TOC]	----	E355-L/VA	0.50	mg/L	101	----	----	----	----
Total Sulfides									
Sulfide, total (as H2S)	7783-06-4	E395-H/VA	0.011	mg/L	0.372	----	----	----	----

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	Location 2	----	----	----	----
					Client sampling date / time	20-Aug-2024 17:00	----	----	----	----
						FJ2402491-001	--------	--------	--------	--------
						Result	----	----	----	----
Total Sulfides										
Sulfide, total (as S)	18496-25-8	E395-H/VA	0.010	mg/L		0.350	----	----	----	----
Total Metals										
Aluminum, total	7429-90-5	E420/VA	0.0030	mg/L		72.3	----	----	----	----
Antimony, total	7440-36-0	E420/VA	0.00010	mg/L		0.00168	----	----	----	----
Arsenic, total	7440-38-2	E420/VA	0.00010	mg/L		0.0325	----	----	----	----
Barium, total	7440-39-3	E420/VA	0.00010	mg/L		9.27	----	----	----	----
Beryllium, total	7440-41-7	E420/VA	0.000100	mg/L		0.00583	----	----	----	----
Bismuth, total	7440-69-9	E420/VA	0.000050	mg/L		0.00136	----	----	----	----
Boron, total	7440-42-8	E420/VA	0.010	mg/L		0.284	----	----	----	----
Cadmium, total	7440-43-9	E420/VA	0.0000050	mg/L		0.0147	----	----	----	----
Calcium, total	7440-70-2	E420/VA	0.050	mg/L		32.5	----	----	----	----
Cesium, total	7440-46-2	E420/VA	0.000010	mg/L		0.0161	----	----	----	----
Chromium, total	7440-47-3	E420/VA	0.00050	mg/L		0.194	----	----	----	----
Cobalt, total	7440-48-4	E420/VA	0.00010	mg/L		0.0891	----	----	----	----
Copper, total	7440-50-8	E420/VA	0.00050	mg/L		0.295	----	----	----	----
Iron, total	7439-89-6	E420/VA	0.010	mg/L		274	----	----	----	----
Lead, total	7439-92-1	E420/VA	0.000050	mg/L		0.102	----	----	----	----
Lithium, total	7439-93-2	E420/VA	0.0010	mg/L		0.119	----	----	----	----
Magnesium, total	7439-95-4	E420/VA	0.0050	mg/L		35.5	----	----	----	----
Manganese, total	7439-96-5	E420/VA	0.00010	mg/L		4.59	----	----	----	----
Mercury, total	7439-97-6	E508/VA	0.0000050	mg/L		0.00143	----	----	----	----
Molybdenum, total	7439-98-7	E420/VA	0.000050	mg/L		0.00922	----	----	----	----
Nickel, total	7440-02-0	E420/VA	0.00050	mg/L		0.328	----	----	----	----
Phosphorus, total	7723-14-0	E420/VA	0.050	mg/L		4.07	----	----	----	----
Potassium, total	7440-09-7	E420/VA	0.050	mg/L		14.4	----	----	----	----
Rubidium, total	7440-17-7	E420/VA	0.00020	mg/L		0.0972	----	----	----	----
Selenium, total	7782-49-2	E420/VA	0.000050	mg/L		0.00438	----	----	----	----
Silicon, total	7440-21-3	E420/VA	0.10	mg/L		87.2	----	----	----	----
Silver, total	7440-22-4	E420/VA	0.000010	mg/L		0.00359	----	----	----	----
Sodium, total	7440-23-5	E420/VA	0.050	mg/L		232	----	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Location 2	----	----	----	----
					Client sampling date / time	20-Aug-2024 17:00	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		FJ2402491-001	--------	--------	--------	--------
						Result	----	----	----	----
Total Metals										
Strontium, total	7440-24-6	E420/VA	0.00020	mg/L		0.528	----	----	----	----
Sulfur, total	7704-34-9	E420/VA	0.50	mg/L		14.0	----	----	----	----
Tellurium, total	13494-80-9	E420/VA	0.00020	mg/L		<0.00100 DLA	----	----	----	----
Thallium, total	7440-28-0	E420/VA	0.000010	mg/L		0.00135	----	----	----	----
Thorium, total	7440-29-1	E420/VA	0.00010	mg/L		0.0348	----	----	----	----
Tin, total	7440-31-5	E420/VA	0.00010	mg/L		<0.00050 DLA	----	----	----	----
Titanium, total	7440-32-6	E420/VA	0.00030	mg/L		0.107	----	----	----	----
Tungsten, total	7440-33-7	E420/VA	0.00010	mg/L		<0.00050 DLA	----	----	----	----
Uranium, total	7440-61-1	E420/VA	0.000010	mg/L		0.0107	----	----	----	----
Vanadium, total	7440-62-2	E420/VA	0.00050	mg/L		0.233	----	----	----	----
Zinc, total	7440-66-6	E420/VA	0.0030	mg/L		1.03	----	----	----	----
Zirconium, total	7440-67-7	E420/VA	0.00020	mg/L		<0.00100 DLA	----	----	----	----
Dissolved Metals										
Aluminum, dissolved	7429-90-5	E421/VA	0.0010	mg/L		0.136	----	----	----	----
Antimony, dissolved	7440-36-0	E421/VA	0.00010	mg/L		0.00206	----	----	----	----
Arsenic, dissolved	7440-38-2	E421/VA	0.00010	mg/L		0.00114	----	----	----	----
Barium, dissolved	7440-39-3	E421/VA	0.00010	mg/L		0.352	----	----	----	----
Beryllium, dissolved	7440-41-7	E421/VA	0.000100	mg/L		<0.000100	----	----	----	----
Bismuth, dissolved	7440-69-9	E421/VA	0.000050	mg/L		<0.000050	----	----	----	----
Boron, dissolved	7440-42-8	E421/VA	0.010	mg/L		0.240	----	----	----	----
Cadmium, dissolved	7440-43-9	E421/VA	0.0000050	mg/L		0.0000186	----	----	----	----
Calcium, dissolved	7440-70-2	E421/VA	0.050	mg/L		7.60	----	----	----	----
Cesium, dissolved	7440-46-2	E421/VA	0.000010	mg/L		0.000057	----	----	----	----
Chromium, dissolved	7440-47-3	E421/VA	0.00050	mg/L		<0.00050	----	----	----	----
Cobalt, dissolved	7440-48-4	E421/VA	0.00010	mg/L		0.00042	----	----	----	----
Copper, dissolved	7440-50-8	E421/VA	0.00020	mg/L		0.00053	----	----	----	----
Iron, dissolved	7439-89-6	E421/VA	0.010	mg/L		0.174	----	----	----	----
Lead, dissolved	7439-92-1	E421/VA	0.000050	mg/L		0.000073	----	----	----	----
Lithium, dissolved	7439-93-2	E421/VA	0.0010	mg/L		0.0068	----	----	----	----
Magnesium, dissolved	7439-95-4	E421/VA	0.0050	mg/L		5.39	----	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Location 2	----	----	----	----
					Client sampling date / time	20-Aug-2024 17:00	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		FJ2402491-001	--------	--------	--------	--------
						Result	----	----	----	----
Dissolved Metals										
Manganese, dissolved	7439-96-5	E421/VA	0.00010	mg/L		0.141	----	----	----	----
Mercury, dissolved	7439-97-6	E509/VA	0.0000050	mg/L		<0.0000050	----	----	----	----
Molybdenum, dissolved	7439-98-7	E421/VA	0.000050	mg/L		0.0192 DTMF	----	----	----	----
Nickel, dissolved	7440-02-0	E421/VA	0.00050	mg/L		0.00347	----	----	----	----
Phosphorus, dissolved	7723-14-0	E421/VA	0.050	mg/L		<0.050	----	----	----	----
Potassium, dissolved	7440-09-7	E421/VA	0.050	mg/L		5.18	----	----	----	----
Rubidium, dissolved	7440-17-7	E421/VA	0.00020	mg/L		0.00188	----	----	----	----
Selenium, dissolved	7782-49-2	E421/VA	0.000050	mg/L		0.000941	----	----	----	----
Silicon, dissolved	7440-21-3	E421/VA	0.050	mg/L		2.04	----	----	----	----
Silver, dissolved	7440-22-4	E421/VA	0.000010	mg/L		<0.000010	----	----	----	----
Sodium, dissolved	7440-23-5	E421/VA	0.050	mg/L		244	----	----	----	----
Strontium, dissolved	7440-24-6	E421/VA	0.00020	mg/L		0.150	----	----	----	----
Sulfur, dissolved	7704-34-9	E421/VA	0.50	mg/L		11.0	----	----	----	----
Tellurium, dissolved	13494-80-9	E421/VA	0.00020	mg/L		<0.00020	----	----	----	----
Thallium, dissolved	7440-28-0	E421/VA	0.000010	mg/L		<0.000010	----	----	----	----
Thorium, dissolved	7440-29-1	E421/VA	0.00010	mg/L		<0.00010	----	----	----	----
Tin, dissolved	7440-31-5	E421/VA	0.00010	mg/L		<0.00010	----	----	----	----
Titanium, dissolved	7440-32-6	E421/VA	0.00030	mg/L		0.00527	----	----	----	----
Tungsten, dissolved	7440-33-7	E421/VA	0.00010	mg/L		<0.00010	----	----	----	----
Uranium, dissolved	7440-61-1	E421/VA	0.000010	mg/L		0.00263	----	----	----	----
Vanadium, dissolved	7440-62-2	E421/VA	0.00050	mg/L		0.00059	----	----	----	----
Zinc, dissolved	7440-66-6	E421/VA	0.0010	mg/L		0.0020	----	----	----	----
Zirconium, dissolved	7440-67-7	E421/VA	0.00020	mg/L		<0.00020	----	----	----	----
Dissolved mercury filtration location	----	EP509/VA	-	-		Field	----	----	----	----
Dissolved metals filtration location	----	EP421/VA	-	-		Field	----	----	----	----
Dissolved Gases										
Methane	74-82-8	EC614B/WT	5.0	µg/L		10.5	----	----	----	----
Methane	74-82-8	E614B/WT	20.8	ppmv		43.6	----	----	----	----

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

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

ALS Canada Ltd.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2402491**	Page	: 1 of 12
Client	: **Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Fort St. John
Contact	: Andrea McMillan	Account Manager	: Wendy Sears
Address	: 110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: ----	Telephone	: +1 250 261 5517
Project	: 704.ENV.GENV 03704-02	Date Samples Received	: 21-Aug-2024 09:00
PO	: ----	Issue Date	: 26-Aug-2024 18:23
C-O-C number	: 20-964332		
Sampler	: Fahim Nazari		
Site	: ----		
Quote number	: VA24-EBAE100-013		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

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

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE Location 2	E235.Br-L	20-Aug-2024	22-Aug-2024	28 days	2 days	✓	22-Aug-2024	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Location 2	E235.Cl	20-Aug-2024	22-Aug-2024	28 days	2 days	✓	22-Aug-2024	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE Location 2	E235.F	20-Aug-2024	22-Aug-2024	28 days	2 days	✓	22-Aug-2024	28 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE Location 2	E235.NO3-L	20-Aug-2024	22-Aug-2024	3 days	2 days	✓	22-Aug-2024	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE Location 2	E235.NO2-L	20-Aug-2024	22-Aug-2024	3 days	2 days	✓	22-Aug-2024	3 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE Location 2	E235.SO4	20-Aug-2024	22-Aug-2024	28 days	2 days	✓	22-Aug-2024	28 days	2 days	✓
Cyanides : Total Cyanide										
UV-inhibited HDPE - total (sodium hydroxide) Location 2	E333	20-Aug-2024	22-Aug-2024	14 days	2 days	✓	22-Aug-2024	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
Dissolved Gases : Methane, Ethane, & Ethene by Headspace GC-FID										
Glass vial (sodium bisulfate) Location 2	E614B	20-Aug-2024	----	----	----		26-Aug-2024	14 days	6 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid) Location 2	E509	20-Aug-2024	22-Aug-2024	28 days	2 days	✓	22-Aug-2024	28 days	2 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid) Location 2	E421	20-Aug-2024	22-Aug-2024	180 days	2 days	✓	22-Aug-2024	180 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid) Location 2	E358-L	20-Aug-2024	22-Aug-2024	28 days	2 days	✓	22-Aug-2024	28 days	2 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid) Location 2	E355-L	20-Aug-2024	22-Aug-2024	28 days	2 days	✓	22-Aug-2024	28 days	2 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE Location 2	E290	20-Aug-2024	22-Aug-2024	14 days	2 days	✓	22-Aug-2024	14 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE Location 2	E329	20-Aug-2024	22-Aug-2024	3 days	2 days	✓	22-Aug-2024	3 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE Location 2	E100	20-Aug-2024	22-Aug-2024	28 days	2 days	✓	22-Aug-2024	28 days	2 days	✓
Physical Tests : pH by Meter										
HDPE Location 2	E108	20-Aug-2024	22-Aug-2024	0.25 hrs	42 hrs	× EHTR-FM	22-Aug-2024	0.25 hrs	43 hrs	× EHTR-FM

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 Location 2	E162	20-Aug-2024	----	----	----		22-Aug-2024	7 days	2 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE Location 2	E121	20-Aug-2024	----	----	----		23-Aug-2024	3 days	3 days	✓
Physical Tests : UV Absorbance and Transmittance by Spectrometry										
HDPE Location 2	E404	20-Aug-2024	----	----	----		22-Aug-2024	3 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) Location 2	E508	20-Aug-2024	23-Aug-2024	28 days	2 days	✓	23-Aug-2024	28 days	2 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) Location 2	E420	20-Aug-2024	22-Aug-2024	180 days	2 days	✓	23-Aug-2024	180 days	3 days	✓
Total Sulfides : Total Sulfide by Colourimetry (Automated Flow)										
HDPE total (zinc acetate+sodium hydroxide) Location 2	E395-H	20-Aug-2024	----	----	----		22-Aug-2024	7 days	2 days	✓

Legend & Qualifier Definitions

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

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

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	1610252	1	6	16.6	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	1610256	1	1	100.0	5.0	✓
Chloride in Water by IC	E235.Cl	1610255	1	1	100.0	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	1610265	1	1	100.0	5.0	✓
Conductivity in Water	E100	1610253	1	6	16.6	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1610588	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1609547	1	11	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1610145	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	1610254	1	1	100.0	5.0	✓
Methane, Ethane, & Ethene by Headspace GC-FID	E614B	1615772	1	16	6.2	4.5	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1610257	1	1	100.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1610258	1	6	16.6	5.0	✓
pH by Meter	E108	1610251	1	6	16.6	5.0	✓
Sulfate in Water by IC	E235.SO4	1610259	1	1	100.0	5.0	✓
TDS by Gravimetry	E162	1610230	1	20	5.0	5.0	✓
Total Cyanide	E333	1610563	1	1	100.0	5.0	✓
Total Mercury in Water by CVAAS	E508	1611944	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1609548	1	17	5.8	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1610140	1	20	5.0	5.0	✓
Total Sulfide by Colourimetry (Automated Flow)	E395-H	1611320	1	19	5.2	5.0	✓
Turbidity by Nephelometry	E121	1612240	1	20	5.0	5.0	✓
UV Absorbance and Transmittance by Spectrometry	E404	1609793	1	4	25.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	1610252	1	6	16.6	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	1610256	1	1	100.0	5.0	✓
Chloride in Water by IC	E235.Cl	1610255	1	1	100.0	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	1610265	1	1	100.0	5.0	✓
Conductivity in Water	E100	1610253	1	6	16.6	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1610588	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1609547	1	11	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1610145	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	1610254	1	1	100.0	5.0	✓
Methane, Ethane, & Ethene by Headspace GC-FID	E614B	1615772	1	16	6.2	4.5	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1610257	1	1	100.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1610258	1	6	16.6	5.0	✓
pH by Meter	E108	1610251	1	6	16.6	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							
Sulfate in Water by IC	E235.SO4	1610259	1	1	100.0	5.0	✓
TDS by Gravimetry	E162	1610230	1	20	5.0	5.0	✓
Total Cyanide	E333	1610563	1	1	100.0	5.0	✓
Total Mercury in Water by CVAAS	E508	1611944	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1609548	1	17	5.8	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1610140	1	20	5.0	5.0	✓
Total Sulfide by Colourimetry (Automated Flow)	E395-H	1611320	1	19	5.2	5.0	✓
Turbidity by Nephelometry	E121	1612240	1	20	5.0	5.0	✓
UV Absorbance and Transmittance by Spectrometry	E404	1609793	1	4	25.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	1610252	1	6	16.6	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	1610256	1	1	100.0	5.0	✓
Chloride in Water by IC	E235.Cl	1610255	1	1	100.0	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	1610265	1	1	100.0	5.0	✓
Conductivity in Water	E100	1610253	1	6	16.6	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1610588	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1609547	1	11	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1610145	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	1610254	1	1	100.0	5.0	✓
Methane, Ethane, & Ethene by Headspace GC-FID	E614B	1615772	1	16	6.2	4.5	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1610257	1	1	100.0	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1610258	1	6	16.6	5.0	✓
Sulfate in Water by IC	E235.SO4	1610259	1	1	100.0	5.0	✓
TDS by Gravimetry	E162	1610230	1	20	5.0	5.0	✓
Total Cyanide	E333	1610563	1	1	100.0	5.0	✓
Total Mercury in Water by CVAAS	E508	1611944	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1609548	1	17	5.8	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1610140	1	20	5.0	5.0	✓
Total Sulfide by Colourimetry (Automated Flow)	E395-H	1611320	1	19	5.2	5.0	✓
Turbidity by Nephelometry	E121	1612240	1	20	5.0	5.0	✓
UV Absorbance and Transmittance by Spectrometry	E404	1609793	1	4	25.0	5.0	✓
Matrix Spikes (MS)							
Bromide in Water by IC (Low Level)	E235.Br-L	1610256	0	1	0.0	5.0	✗
Chloride in Water by IC	E235.Cl	1610255	0	1	0.0	5.0	✗
Dissolved Mercury in Water by CVAAS	E509	1610588	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1609547	1	11	9.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1610145	1	13	7.6	5.0	✓
Fluoride in Water by IC	E235.F	1610254	0	1	0.0	5.0	✗
Nitrate in Water by IC (Low Level)	E235.NO3-L	1610257	0	1	0.0	5.0	✗

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Matrix Spikes (MS) - Continued							
Nitrite in Water by IC (Low Level)	E235.NO2-L	1610258	1	6	16.6	5.0	✓
Sulfate in Water by IC	E235.SO4	1610259	0	1	0.0	5.0	×
Total Cyanide	E333	1610563	0	1	0.0	5.0	×
Total Mercury in Water by CVAAS	E508	1611944	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1609548	1	17	5.8	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1610140	1	20	5.0	5.0	✓
Total Sulfide by Colourimetry (Automated Flow)	E395-H	1611320	1	19	5.2	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
Conductivity in Water	E100 ALS Environmental - Vancouver	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 ALS Environmental - Vancouver	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 ALS Environmental - Vancouver	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
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.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
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.
Colour (True) by Spectrometer (5 CU)	E329 ALS Environmental - Vancouver	Water	APHA 2120 C (mod)	Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment.
Total Cyanide	E333 ALS Environmental - Vancouver	Water	ISO 14403 (mod)	Total or Strong Acid Dissociable (SAD) Cyanide is determined by Continuous Flow Analyzer (CFA) with in-line UV digestion followed by colourmetric analysis. Method Limitation: High levels of thiocyanate (SCN) may cause positive interference (up to 0.5% of SCN concentration).
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L ALS Environmental - Vancouver	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L ALS Environmental - Vancouver	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Sulfide by Colourimetry (Automated Flow)	E395-H ALS Environmental - Vancouver	Water	APHA 4500 -S E-Auto-Colorimetry	Sulfide is determined using the gas dialysis automated methlyene blue colourimetric method. Results expressed "as H_2S" if reported represent the maximum possible H_2S concentration based on the total sulfide concentration in the sample. The H_2S calculation converts Total Sulphide as (S2-) and reports it as Total Sulphide as (H_2S)
UV Absorbance and Transmittance by Spectrometry	E404 ALS Environmental - Vancouver	Water	APHA 5910 B (mod)	UV Absorbance is determined by first filtering a sample through a 0.45 micron filter, followed by UV absorbance measurement in a quartz cell at 254 nm. The analysis is carried out without pH adjustment.
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.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
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
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.
Methane, Ethane, & Ethene by Headspace GC-FID	E614B ALS Environmental - Waterloo	Water	EPA REGION 1, NATATTEN.WPD, REV. 1	Volatile hydrocarbons are analyzed by static headspace GC/FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing the analyte(s) to partition between the aqueous phase and the headspace in accordance with Henry's law.
Dissolved Hardness (Calculated)	EC100 ALS Environmental - Vancouver	Water	APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Hardness (Calculated) from Total Ca/Mg	EC100A ALS Environmental - Vancouver	Water	APHA 2340B	"Hardness (as CaCO3), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.
Methane, Ethane, & Ethene by Headspace GC-FID	EC614B ALS Environmental - Waterloo	Water	Unit Conversion	Convert ppmV to ug/L

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Total Organic Carbon by Combustion	EP355 ALS Environmental - Vancouver	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 ALS Environmental - Vancouver	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
Dissolved Metals Water Filtration	EP421	Water	APHA 3030B	Water samples are filtered (0.45 um), and preserved with HNO3.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
	ALS Environmental - Vancouver			
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	: **FJ2402491**	Page	: 1 of 17
Client	: Tetra Tech Canada Inc.	Laboratory	: ALS Environmental - Fort St. John
Contact	: Andrea McMillan	Account Manager	: Wendy Sears
Address	: 110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: ----	Telephone	: +1 250 261 5517
Project	: 704.ENV.GENV 03704-02	Date Samples Received	: 21-Aug-2024 09:00
PO	: ----	Date Analysis Commenced	: 22-Aug-2024
C-O-C number	: 20-964332	Issue Date	: 26-Aug-2024 18:23
Sampler	: Fahim Nazari		
Site	: ----		
Quote number	: VA24-EBAE100-013		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Andrea Armstrong	Department Manager - Air Quality and Volatiles	Waterloo Air Quality, Waterloo, Ontario
Angela Ren	Team Leader - Metals	Vancouver Metals, Burnaby, British Columbia
Ilnaz Badbezanchi	Supervisor - Metals Prep & Mercury	Vancouver Metals, Burnaby, British Columbia
Kate Dimitrova	Supervisor - Inorganic	Vancouver Inorganics, Burnaby, British Columbia
Manpreet Cheema	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Maya Urquhart	Lab Analyst	Vancouver Metals, Burnaby, British Columbia
Owen Cheng		Vancouver Metals, Burnaby, British Columbia

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

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

Workorder Comments

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Physical Tests (QC Lot: 1609793)											
FJ2402491-001	Location 2	Absorbance, UV (@ 254nm)	----	E404	0.0050	AU/cm	0.141	0.141	0.00%	20%	----
Physical Tests (QC Lot: 1610230)											
KS2403260-001	Anonymous	Solids, total dissolved [TDS]	----	E162	13	mg/L	56	55	1	Diff <2x LOR	----
Physical Tests (QC Lot: 1610251)											
VA24C1137-003	Anonymous	pH	----	E108	0.10	pH units	5.53	5.48	0.908%	4%	----
Physical Tests (QC Lot: 1610252)											
VA24C1137-003	Anonymous	Alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0.00%	200%	----
		Alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0.00%	200%	----
		Alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0.00%	200%	----
		Alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0	Diff <2x LOR	----
		Alkalinity, total (as CaCO3)	----	E290	2.0	mg/L	<2.0	<2.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 1610253)											
VA24C1137-003	Anonymous	Conductivity	----	E100	1.0	µS/cm	1.0	<1.0	0.05	Diff <2x LOR	----
Physical Tests (QC Lot: 1610265)											
FJ2402491-001	Location 2	Colour, true	----	E329	5.0	CU	5.8	5.9	0.1	Diff <2x LOR	----
Physical Tests (QC Lot: 1612240)											
KS2403379-001	Anonymous	Turbidity	----	E121	0.10	NTU	0.90	1.01	0.11	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1610254)											
FJ2402491-001	Location 2	Fluoride	16984-48-8	E235.F	0.100	mg/L	0.478	0.475	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1610255)											
FJ2402491-001	Location 2	Chloride	16887-00-6	E235.Cl	2.50	mg/L	19.0	19.0	0.06	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1610256)											
FJ2402491-001	Location 2	Bromide	24959-67-9	E235.Br-L	0.250	mg/L	<0.250	<0.250	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1610257)											
FJ2402491-001	Location 2	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	0.0412	0.0415	0.0003	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1610258)											
FJ2402491-001	Location 2	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1610259)											
FJ2402491-001	Location 2	Sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	12.7	12.5	0.16	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*
Cyanides (QC Lot: 1610563)											
FJ2402491-001	Location 2	Cyanide, strong acid dissociable (Total)	----	E333	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 1610140)											
FJ2402449-003	Anonymous	Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	2.61	2.74	0.13	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 1610145)											
FJ2402450-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	2.84	2.99	0.15	Diff <2x LOR	----
Total Sulfides (QC Lot: 1611320)											
FJ2402451-001	Anonymous	Sulfide, total (as S)	18496-25-8	E395-H	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Total Metals (QC Lot: 1609548)											
FJ2402491-001	Location 2	Aluminum, total	7429-90-5	E420	0.0150	mg/L	72.3	74.5	3.08%	20%	----
		Antimony, total	7440-36-0	E420	0.00050	mg/L	0.00168	0.00176	0.00007	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00050	mg/L	0.0325	0.0354	8.46%	20%	----
		Barium, total	7440-39-3	E420	0.00050	mg/L	9.27	9.52	2.71%	20%	----
		Beryllium, total	7440-41-7	E420	0.000100	mg/L	0.00583	0.00606	3.80%	20%	----
		Bismuth, total	7440-69-9	E420	0.000250	mg/L	0.00136	0.00137	0.000016	Diff <2x LOR	----
		Boron, total	7440-42-8	E420	0.050	mg/L	0.284	0.294	0.010	Diff <2x LOR	----
		Cadmium, total	7440-43-9	E420	0.0000250	mg/L	0.0147	0.0147	0.0129%	20%	----
		Calcium, total	7440-70-2	E420	0.250	mg/L	32.5	33.2	2.17%	20%	----
		Cesium, total	7440-46-2	E420	0.000050	mg/L	0.0161	0.0158	1.33%	20%	----
		Chromium, total	7440-47-3	E420	0.00250	mg/L	0.194	0.198	2.37%	20%	----
		Cobalt, total	7440-48-4	E420	0.00050	mg/L	0.0891	0.0909	1.96%	20%	----
		Copper, total	7440-50-8	E420	0.00250	mg/L	0.295	0.299	1.33%	20%	----
		Iron, total	7439-89-6	E420	0.050	mg/L	274	287	4.42%	20%	----
		Lead, total	7439-92-1	E420	0.000250	mg/L	0.102	0.100	1.13%	20%	----
		Lithium, total	7439-93-2	E420	0.0050	mg/L	0.119	0.127	6.33%	20%	----
		Magnesium, total	7439-95-4	E420	0.0250	mg/L	35.5	35.7	0.636%	20%	----
		Manganese, total	7439-96-5	E420	0.00050	mg/L	4.59	4.70	2.39%	20%	----
		Molybdenum, total	7439-98-7	E420	0.000250	mg/L	0.00922	0.0106	13.9%	20%	----
		Nickel, total	7440-02-0	E420	0.00250	mg/L	0.328	0.332	1.07%	20%	----
		Phosphorus, total	7723-14-0	E420	0.250	mg/L	4.07	3.86	5.44%	20%	----
		Potassium, total	7440-09-7	E420	0.250	mg/L	14.4	14.7	1.90%	20%	----
		Rubidium, total	7440-17-7	E420	0.00100	mg/L	0.0972	0.0986	1.42%	20%	----
		Selenium, total	7782-49-2	E420	0.000250	mg/L	0.00438	0.00529	18.9%	20%	----
		Silicon, total	7440-21-3	E420	0.50	mg/L	87.2	92.8	6.19%	20%	----
		Silver, total	7440-22-4	E420	0.000050	mg/L	0.00359	0.00347	3.58%	20%	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Laboratory Duplicate (DUP) Report						
					LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Total Metals (QC Lot: 1609548) - continued											
FJ2402491-001	Location 2	Sodium, total	7440-23-5	E420	0.250	mg/L	232	233	0.703%	20%	----
		Strontium, total	7440-24-6	E420	0.00100	mg/L	0.528	0.505	4.33%	20%	----
		Sulfur, total	7704-34-9	E420	2.50	mg/L	14.0	13.7	0.29	Diff <2x LOR	----
		Tellurium, total	13494-80-9	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Thallium, total	7440-28-0	E420	0.000050	mg/L	0.00135	0.00133	1.57%	20%	----
		Thorium, total	7440-29-1	E420	0.00050	mg/L	0.0348	0.0353	1.24%	20%	----
		Tin, total	7440-31-5	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Titanium, total	7440-32-6	E420	0.00150	mg/L	0.107	0.115	6.95%	20%	----
		Tungsten, total	7440-33-7	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Uranium, total	7440-61-1	E420	0.000050	mg/L	0.0107	0.0106	1.09%	20%	----
		Vanadium, total	7440-62-2	E420	0.00250	mg/L	0.233	0.242	3.68%	20%	----
		Zinc, total	7440-66-6	E420	0.0150	mg/L	1.03	1.04	0.726%	20%	----
		Zirconium, total	7440-67-7	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
Total Metals (QC Lot: 1611944)											
FJ2402413-003	Anonymous	Mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 1609547)											
FJ2402491-001	Location 2	Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.136	0.145	6.22%	20%	----
		Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00206	0.00208	1.08%	20%	----
		Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00114	0.00114	0.258%	20%	----
		Barium, dissolved	7440-39-3	E421	0.00010	mg/L	0.352	0.370	4.89%	20%	----
		Beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Bismuth, dissolved	7440-69-9	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Boron, dissolved	7440-42-8	E421	0.010	mg/L	0.240	0.234	2.50%	20%	----
		Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	0.0000186	0.0000186	0.00000001	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.050	mg/L	7.60	7.49	1.52%	20%	----
		Cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000057	0.000062	0.000005	Diff <2x LOR	----
		Chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00042	0.00042	0.000003	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00020	mg/L	0.00053	0.00052	0.000009	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.010	mg/L	0.174	0.173	0.954%	20%	----
		Lead, dissolved	7439-92-1	E421	0.000050	mg/L	0.000073	0.000074	0.0000005	Diff <2x LOR	----
		Lithium, dissolved	7439-93-2	E421	0.0010	mg/L	0.0068	0.0068	0.00003	Diff <2x LOR	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	5.39	5.19	3.78%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.141	0.139	1.58%	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: 1609547) - continued											
FJ2402491-001	Location 2	Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.0192	0.0197	2.72%	20%	----
		Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00347	0.00354	0.00006	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	5.18	5.29	2.23%	20%	----
		Rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00188	0.00195	0.00007	Diff <2x LOR	----
		Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	0.000941	0.000890	5.60%	20%	----
		Silicon, dissolved	7440-21-3	E421	0.050	mg/L	2.04	1.95	4.65%	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	244	239	1.80%	20%	----
		Strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.150	0.149	0.394%	20%	----
		Sulfur, dissolved	7704-34-9	E421	0.50	mg/L	11.0	10.6	3.68%	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	0.00527	0.00468	11.7%	20%	----
		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	0.00263	0.00264	0.380%	20%	----
		Vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	0.00059	0.00058	0.00001	Diff <2x LOR	----
		Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0020	0.0018	0.0001	Diff <2x LOR	----
		Zirconium, dissolved	7440-67-7	E421	0.00020	mg/L	<0.00020	0.00032	0.00012	Diff <2x LOR	----
Dissolved Metals (QC Lot: 1610588)											
FJ2402491-001	Location 2	Mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Gases (QC Lot: 1615772)											
FJ2402491-001	Location 2	Methane	74-82-8	E614B	20.8	ppmv	43.6	43.6	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: 1609793)						
Absorbance, UV (@ 254nm)	----	E404	0.005	AU/cm	<0.0050	----
Physical Tests (QCLot: 1610230)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 1610252)						
Alkalinity, bicarbonate (as CaCO3)	----	E290	1	mg/L	<1.0	----
Alkalinity, carbonate (as CaCO3)	----	E290	1	mg/L	<1.0	----
Alkalinity, hydroxide (as CaCO3)	----	E290	1	mg/L	<1.0	----
Alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	<1.0	----
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 1610253)						
Conductivity	----	E100	1	µS/cm	1.1	----
Physical Tests (QCLot: 1610265)						
Colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 1612240)						
Turbidity	----	E121	0.1	NTU	<0.10	----
Anions and Nutrients (QCLot: 1610254)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1610255)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 1610256)						
Bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 1610257)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1610258)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 1610259)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Cyanides (QCLot: 1610563)						
Cyanide, strong acid dissociable (Total)	----	E333	0.002	mg/L	<0.0020	----
Organic / Inorganic Carbon (QCLot: 1610140)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 1610145)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Organic / Inorganic Carbon (QCLot: 1610145) - continued						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Total Sulfides (QCLot: 1611320)						
Sulfide, total (as S)	18496-25-8	E395-H	0.01	mg/L	<0.010	----
Total Metals (QCLot: 1609548)						
Aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
Barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
Boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
Calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
Copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
Iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
Lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
Lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
Potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
Silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
Silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
Sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 1609548) - continued						
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	----
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: 1611944)						
Mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 1609547)						
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	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 1609547) - continued						
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	----
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: 1610588)						
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Dissolved Gases (QCLot: 1615772)						
Methane	74-82-8	E614B	20.77	ppmv	<20.8	----

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	Target Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1609793)									
Absorbance, UV (@ 254nm)	----	E404	0.005	AU/cm	0.693 AU/cm	93.9	85.0	115	----
Transmittance, UV (@ 254nm)	----	E404	----	% T/cm	20.3 % T/cm	110	85.0	115	----
Physical Tests (QCLot: 1610230)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	102	85.0	115	----
Physical Tests (QCLot: 1610251)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 1610252)									
Alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	94.9	75.0	125	----
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	104	85.0	115	----
Physical Tests (QCLot: 1610253)									
Conductivity	----	E100	1	µS/cm	147 µS/cm	97.6	90.0	110	----
Physical Tests (QCLot: 1610265)									
Colour, true	----	E329	5	CU	100 CU	105	85.0	115	----
Physical Tests (QCLot: 1612240)									
Turbidity	----	E121	0.1	NTU	200 NTU	96.5	85.0	115	----
Anions and Nutrients (QCLot: 1610254)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 1610255)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 1610256)									
Bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	103	85.0	115	----
Anions and Nutrients (QCLot: 1610257)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 1610258)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	102	90.0	110	----
Anions and Nutrients (QCLot: 1610259)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	103	90.0	110	----
Cyanides (QCLot: 1610563)									
Cyanide, strong acid dissociable (Total)	----	E333	0.002	mg/L	0.25 mg/L	96.7	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Target Concentration	LCS	Low	High	Qualifier
Organic / Inorganic Carbon (QCLot: 1610140)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	99.6	80.0	120	----
Organic / Inorganic Carbon (QCLot: 1610145)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	96.2	80.0	120	----
Total Sulfides (QCLot: 1611320)									
Sulfide, total (as H2S)	7783-06-4	E395-H	----	mg/L	0.085 mg/L	106	80.0	120	----
Sulfide, total (as S)	18496-25-8	E395-H	0.01	mg/L	0.08 mg/L	107	80.0	120	----
Total Metals (QCLot: 1609548)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	99.2	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	107	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	108	80.0	120	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	98.9	80.0	120	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	97.9	80.0	120	----
Boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	94.4	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	99.8	80.0	120	----
Calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	99.1	80.0	120	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	99.5	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	99.6	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	98.7	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	97.4	80.0	120	----
Iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	95.6	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	97.0	80.0	120	----
Lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	95.0	80.0	120	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	96.3	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	100	80.0	120	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	106	80.0	120	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	99.0	80.0	120	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	102	80.0	120	----
Potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	100	80.0	120	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	99.7	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	105	80.0	120	----
Silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	115	80.0	120	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	95.4	80.0	120	----
Sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	106	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Target Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 1609548) - continued									
Strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	107	80.0	120	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	92.1	80.0	120	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	99.8	80.0	120	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	92.6	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	100	80.0	120	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	93.4	80.0	120	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	97.0	80.0	120	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	91.8	80.0	120	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	101	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	99.4	80.0	120	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	102	80.0	120	----
Total Metals (QCLot: 1611944)									
Mercury, total	7439-97-6	E508	0.000005	mg/L	0 mg/L	99.3	80.0	120	----
Dissolved Metals (QCLot: 1609547)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	95.4	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	98.3	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	102	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	105	80.0	120	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	96.3	80.0	120	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	95.1	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	91.7	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	98.0	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	100	80.0	120	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	95.8	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	98.8	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	95.3	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	95.4	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	88.9	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	97.8	80.0	120	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	92.2	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	94.6	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	97.4	80.0	120	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	104	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	98.4	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 1609547) - continued									
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	98.2	80.0	120	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	100	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	96.7	80.0	120	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	104	80.0	120	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	93.6	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	98.9	80.0	120	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	106	80.0	120	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	97.4	80.0	120	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	99.7	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	100	80.0	120	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	94.5	80.0	120	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	97.6	80.0	120	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	92.5	80.0	120	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	99.5	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	92.9	80.0	120	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	99.5	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	93.1	80.0	120	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	97.9	80.0	120	----
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0 mg/L	96.9	80.0	120	----
Dissolved Gases (QCLot: 1615772)									
Methane	74-82-8	E614B	20.77	ppmv	432 ppmv	95.2	80.0	120	----

Matrix Spike (MS) Report

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

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 1610258)										
VA24C1137-002	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.510 mg/L	0.5 mg/L	102	75.0	125	----
Organic / Inorganic Carbon (QCLot: 1610140)										
FJ2402449-004	Anonymous	Carbon, total organic [TOC]	----	E355-L	4.74 mg/L	5 mg/L	94.8	70.0	130	----
Organic / Inorganic Carbon (QCLot: 1610145)										
FJ2402450-002	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	4.66 mg/L	5 mg/L	93.2	70.0	130	----
Total Sulfides (QCLot: 1611320)										
FJ2402451-002	Anonymous	Sulfide, total (as S)	18496-25-8	E395-H	0.956 mg/L	1 mg/L	95.6	75.0	125	----
Total Metals (QCLot: 1609548)										
VA24C0978-001	Anonymous	Aluminum, total	7429-90-5	E420	0.186 mg/L	0.2 mg/L	92.8	70.0	130	----
		Antimony, total	7440-36-0	E420	0.0192 mg/L	0.02 mg/L	96.2	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.0194 mg/L	0.02 mg/L	96.9	70.0	130	----
		Barium, total	7440-39-3	E420	ND mg/L	----	ND	70.0	130	----
		Beryllium, total	7440-41-7	E420	0.0390 mg/L	0.04 mg/L	97.6	70.0	130	----
		Bismuth, total	7440-69-9	E420	0.00927 mg/L	0.01 mg/L	92.7	70.0	130	----
		Boron, total	7440-42-8	E420	0.093 mg/L	0.1 mg/L	93.4	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.00385 mg/L	0.004 mg/L	96.2	70.0	130	----
		Calcium, total	7440-70-2	E420	ND mg/L	----	ND	70.0	130	----
		Cesium, total	7440-46-2	E420	0.00990 mg/L	0.01 mg/L	99.0	70.0	130	----
		Chromium, total	7440-47-3	E420	0.0381 mg/L	0.04 mg/L	95.3	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.0186 mg/L	0.02 mg/L	92.8	70.0	130	----
		Copper, total	7440-50-8	E420	0.0188 mg/L	0.02 mg/L	93.9	70.0	130	----
		Iron, total	7439-89-6	E420	1.89 mg/L	2 mg/L	94.6	70.0	130	----
		Lead, total	7439-92-1	E420	0.0189 mg/L	0.02 mg/L	94.5	70.0	130	----
		Lithium, total	7439-93-2	E420	0.0919 mg/L	0.1 mg/L	91.9	70.0	130	----
		Magnesium, total	7439-95-4	E420	ND mg/L	----	ND	70.0	130	----
		Manganese, total	7439-96-5	E420	ND mg/L	----	ND	70.0	130	----
		Molybdenum, total	7439-98-7	E420	0.0209 mg/L	0.02 mg/L	104	70.0	130	----
		Nickel, total	7440-02-0	E420	0.0375 mg/L	0.04 mg/L	93.8	70.0	130	----
		Phosphorus, total	7723-14-0	E420	9.37 mg/L	10 mg/L	93.7	70.0	130	----
		Potassium, total	7440-09-7	E420	3.65 mg/L	4 mg/L	91.2	70.0	130	----
		Rubidium, total	7440-17-7	E420	0.0188 mg/L	0.02 mg/L	94.1	70.0	130	----
		Selenium, total	7782-49-2	E420	0.0417 mg/L	0.04 mg/L	104	70.0	130	----
		Silicon, total	7440-21-3	E420	9.12 mg/L	10 mg/L	91.2	70.0	130	----
		Silver, total	7440-22-4	E420	0.00416 mg/L	0.004 mg/L	104	70.0	130	----
		Sodium, total	7440-23-5	E420	ND mg/L	----	ND	70.0	130	----
		Strontium, total	7440-24-6	E420	ND mg/L	----	ND	70.0	130	----
		Sulfur, total	7704-34-9	E420	ND mg/L	----	ND	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Total Metals (QCLot: 1609548) - continued										
VA24C0978-001	Anonymous	Tellurium, total	13494-80-9	E420	0.0415 mg/L	0.04 mg/L	104	70.0	130	----
		Thallium, total	7440-28-0	E420	0.00378 mg/L	0.004 mg/L	94.5	70.0	130	----
		Thorium, total	7440-29-1	E420	0.0155 mg/L	0.02 mg/L	77.3	70.0	130	----
		Tin, total	7440-31-5	E420	0.0193 mg/L	0.02 mg/L	96.4	70.0	130	----
		Titanium, total	7440-32-6	E420	0.0345 mg/L	0.04 mg/L	86.2	70.0	130	----
		Tungsten, total	7440-33-7	E420	0.0197 mg/L	0.02 mg/L	98.6	70.0	130	----
		Uranium, total	7440-61-1	E420	0.00376 mg/L	0.004 mg/L	93.9	70.0	130	----
		Vanadium, total	7440-62-2	E420	0.0962 mg/L	0.1 mg/L	96.2	70.0	130	----
		Zinc, total	7440-66-6	E420	0.361 mg/L	0.4 mg/L	90.3	70.0	130	----
		Zirconium, total	7440-67-7	E420	0.0426 mg/L	0.04 mg/L	106	70.0	130	----
Total Metals (QCLot: 1611944)										
FJ2402413-004	Anonymous	Mercury, total	7439-97-6	E508	0.000101 mg/L	0 mg/L	101	70.0	130	----
Dissolved Metals (QCLot: 1609547)										
VA24C1257-001	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.192 mg/L	0.2 mg/L	95.8	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.0194 mg/L	0.02 mg/L	97.2	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.0201 mg/L	0.02 mg/L	100	70.0	130	----
		Barium, dissolved	7440-39-3	E421	ND mg/L	----	ND	70.0	130	----
		Beryllium, dissolved	7440-41-7	E421	0.0384 mg/L	0.04 mg/L	96.1	70.0	130	----
		Bismuth, dissolved	7440-69-9	E421	0.00891 mg/L	0.01 mg/L	89.1	70.0	130	----
		Boron, dissolved	7440-42-8	E421	0.099 mg/L	0.1 mg/L	99.4	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.00389 mg/L	0.004 mg/L	97.2	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	----	ND	70.0	130	----
		Cesium, dissolved	7440-46-2	E421	0.0100 mg/L	0.01 mg/L	100	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.0381 mg/L	0.04 mg/L	95.3	70.0	130	----
		Cobalt, dissolved	7440-48-4	E421	0.0181 mg/L	0.02 mg/L	90.6	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.0180 mg/L	0.02 mg/L	89.9	70.0	130	----
		Iron, dissolved	7439-89-6	E421	1.91 mg/L	2 mg/L	95.4	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.0182 mg/L	0.02 mg/L	91.1	70.0	130	----
		Lithium, dissolved	7439-93-2	E421	0.0925 mg/L	0.1 mg/L	92.5	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	----	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	0.0188 mg/L	0.02 mg/L	93.9	70.0	130	----
		Molybdenum, dissolved	7439-98-7	E421	0.0209 mg/L	0.02 mg/L	105	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.0371 mg/L	0.04 mg/L	92.7	70.0	130	----
		Phosphorus, dissolved	7723-14-0	E421	9.64 mg/L	10 mg/L	96.4	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	4.00 mg/L	4 mg/L	100	70.0	130	----
		Rubidium, dissolved	7440-17-7	E421	0.0189 mg/L	0.02 mg/L	94.7	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.0408 mg/L	0.04 mg/L	102	70.0	130	----
		Silicon, dissolved	7440-21-3	E421	ND mg/L	----	ND	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.00402 mg/L	0.004 mg/L	100	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	ND mg/L	----	ND	70.0	130	----
		Strontium, dissolved	7440-24-6	E421	ND mg/L	----	ND	70.0	130	----
		Sulfur, dissolved	7704-34-9	E421	ND mg/L	----	ND	70.0	130	----
		Tellurium, dissolved	13494-80-9	E421	0.0413 mg/L	0.04 mg/L	103	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: 1609547) - continued										
VA24C1257-001	Anonymous	Thallium, dissolved	7440-28-0	E421	0.00364 mg/L	0.004 mg/L	91.0	70.0	130	----
		Thorium, dissolved	7440-29-1	E421	0.0168 mg/L	0.02 mg/L	83.9	70.0	130	----
		Tin, dissolved	7440-31-5	E421	0.0195 mg/L	0.02 mg/L	97.4	70.0	130	----
		Titanium, dissolved	7440-32-6	E421	0.0358 mg/L	0.04 mg/L	89.6	70.0	130	----
		Tungsten, dissolved	7440-33-7	E421	0.0191 mg/L	0.02 mg/L	95.5	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	0.00352 mg/L	0.004 mg/L	88.0	70.0	130	----
		Vanadium, dissolved	7440-62-2	E421	0.0964 mg/L	0.1 mg/L	96.4	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	0.365 mg/L	0.4 mg/L	91.2	70.0	130	----
		Zirconium, dissolved	7440-67-7	E421	0.0411 mg/L	0.04 mg/L	103	70.0	130	----
Dissolved Metals (QCLot: 1610588)										
KS2403294-001	Anonymous	Mercury, dissolved	7439-97-6	E509	0.0000974 mg/L	0 mg/L	97.4	70.0	130	----

Chain of Custody (COC) / Analytical Request Form

COC Number: 20 - 964332

Page 1 of 1

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

Environmental Division
Fort St. John
Work Order Reference
FJ2402491

Telephone : +1 250 261 5517

Report To	Contact and company name below will appear on the final report
Company:	Tetra Tech
Contact:	Andrea McMillan
Phone:	403-203-3355
	Company address below will appear on the final report
Street:	140 Quarry Park Blvd
City/Province:	Calgary AB
Postal Code:	T2C 3G3
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	
Contact:	

Reports / Recipients	
Select Report Format:	☑ PDF ☑ EXCEL ☐ EDD (DIGITAL)
Merge QC/QCI Reports with COA	☐ YES ☐ NO ☐ N/A
☐ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☐ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	Andrea.McMillan@TetraTech.com
Email 2	Eba.labdata@TetraTech.com
Email 3	Aziz.Shaikh@TetraTech.com
Invoice Recipients	
Select Invoice Distribution:	☐ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	
Email 2	

Turnaround Time (TAT) Requested
☐ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minim
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minim
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minim
☑ 1 day [E] if received by 3pm M-F - 100% rush surcharge minim
☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Ad may apply to rush requests on weekends, statutory holidays and non-
Date and Time Required for all E&P TATs:
For all tests with rush TATs requested, please

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:		AFE/Cost Center:	PO#:
Job #:	704-ENW.GenW 03704-02	Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (ALS use only):		ALS Contact:	Sampler:

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Analysis Request: Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P)											SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
						Dissolved gas (Ethy, H2S)	Routine	Anions	physical test	H2S	Dissolved metals	Total metals+Hg	Cyanide	DOC	Total organic Carbon				
	Location 2	20-Aug-24	16:00	GW	12	F/P	✓	✓	✓	✓	✓	F/P	✓	✓	✓				

Rush Samples

Drinking Water (DW) Samples[1] (client use)	Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)
Are samples taken from a Regulated DW System? ☐ YES ☐ NO	- Confirm Analysis with Andrea McMillan
Are samples for human consumption/ use? ☐ YES ☐ NO	- EQUAT format

SAMPLE RECEIPT DETAILS (ALS use only)

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

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

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

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
13.4							

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released: [redacted]	Date: Aug-20-2024	Time: 17:45	[redacted]	Date: Aug 21/24	Time: 8:00	Received by:	Date:	Time:

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

ALS 2020 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.

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2402552**	Page	: 1 of 4
Client	: **Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Fort St. John
Contact	: Andrea McMillan	Account Manager	: Brent Mack
Address	: 110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: ----	Telephone	: 778-370-3279
Project	: 704-ENW.GENV03704-02	Date Samples Received	: 23-Aug-2024 13:00
PO	: ----	Date Analysis Commenced	: 03-Sep-2024
C-O-C number	: ----	Issue Date	: 05-Sep-2024 09:46
Sampler	: Fahim Nazari		
Site	: ----		
Quote number	: VA24-EBAE100-013		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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*
David Tremblett	VOC Section Supervisor	Air Quality, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	Air Quality, Waterloo, Ontario

General Comments

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

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

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

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

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	no units
%	percent
µg/m³	micrograms per cubic metre
Inches Hg	inches of mercury
ppbv	parts per billion (volume/volume)

<: 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.

Qualifiers

Qualifier	*Description*
HTA	*Analytical holding time was exceeded.*

Analytical Results

Sub-Matrix: Canister (Matrix: Air)				Client sample ID	LOCATION 2 AIR	----	----	----	----
				Client sampling date / time	23-Aug-2024 11:48	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	FJ2402552-001	--------	--------	--------	--------
					Result	----	----	----	----
Field Tests									
ID, batch proof	----	EF001/WT	-	-	240702.225	----	----	----	----
ID, canister	----	EF001/WT	-	-	01400-0339	----	----	----	----
ID, regulator	----	EF001/WT	-	-	G165	----	----	----	----
Pressure on receipt	----	EF001/WT	0.10	Inches Hg	-8.17	----	----	----	----
Sulfur Compounds									
Carbon disulfide	75-15-0	EC630/WT	6.2	µg/m³	142	----	----	----	----
Carbon disulfide	75-15-0	E630/WT	2.0	ppbv	45.7 HTA	----	----	----	----
Carbonyl sulfide	463-58-1	EC630/WT	10	µg/m³	607	----	----	----	----
Carbonyl sulfide	463-58-1	E630/WT	4.0	ppbv	247 HTA	----	----	----	----
Diethyl disulfide	110-81-6	EC630/WT	10	µg/m³	<10	----	----	----	----
Diethyl disulfide	110-81-6	E630/WT	2.0	ppbv	<2.0 HTA	----	----	----	----
Diethyl sulfide	352-93-2	EC630/WT	15	µg/m³	<15	----	----	----	----
Diethyl sulfide	352-93-2	E630/WT	4.0	ppbv	<4.0 HTA	----	----	----	----
Dimethyl disulfide	624-92-0	EC630/WT	7.7	µg/m³	<7.7	----	----	----	----
Dimethyl disulfide	624-92-0	E630/WT	2.0	ppbv	<2.0 HTA	----	----	----	----
Dimethyl sulfide	75-18-3	EC630/WT	10	µg/m³	<10	----	----	----	----
Dimethyl sulfide	75-18-3	E630/WT	4.0	ppbv	<4.0 HTA	----	----	----	----
Dimethylthiophene, 2,5-	638-02-8	EC630/WT	18	µg/m³	<18	----	----	----	----
Dimethylthiophene, 2,5-	638-02-8	E630/WT	4.0	ppbv	<4.0 HTA	----	----	----	----
Ethyl mercaptan	75-08-1	EC630/WT	10	µg/m³	<10	----	----	----	----
Ethyl mercaptan	75-08-1	E630/WT	4.0	ppbv	<4.0 HTA	----	----	----	----
Ethyl methyl sulfide	624-89-5	EC630/WT	12	µg/m³	<12	----	----	----	----
Ethyl methyl sulfide	624-89-5	E630/WT	4.0	ppbv	<4.0 HTA	----	----	----	----
Ethylthiophene, 2-	872-55-9	EC630/WT	18	µg/m³	<18	----	----	----	----
Ethylthiophene, 2-	872-55-9	E630/WT	4.0	ppbv	<4.0 HTA	----	----	----	----
Hydrogen sulfide	7783-06-4	EC630/WT	5.6	µg/m³	18.8	----	----	----	----
Hydrogen sulfide	7783-06-4	E630/WT	4.0	ppbv	13.5 HTA	----	----	----	----
Isobutyl mercaptan	513-44-0	EC630/WT	15	µg/m³	<15	----	----	----	----
Isobutyl mercaptan	513-44-0	E630/WT	4.0	ppbv	<4.0 HTA	----	----	----	----

Analytical Results

Sub-Matrix: Canister (Matrix: Air)					Client sample ID	LOCATION 2 AIR	----	----	----	----
					Client sampling date / time	23-Aug-2024 11:48	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		FJ2402552-001	--------	--------	--------	--------
						Result	----	----	----	----
Sulfur Compounds										
Isopropyl mercaptan	75-33-2	EC630/WT	12	µg/m³		<12	----	----	----	----
Isopropyl mercaptan	75-33-2	E630/WT	4.0	ppbv		<4.0 HTA	----	----	----	----
Methyl mercaptan	74-93-1	EC630/WT	7.9	µg/m³		<7.9	----	----	----	----
Methyl mercaptan	74-93-1	E630/WT	4.0	ppbv		<4.0 HTA	----	----	----	----
Methylthiophene, 2-	554-14-3	EC630/WT	16	µg/m³		<16	----	----	----	----
Methylthiophene, 2-	554-14-3	E630/WT	4.0	ppbv		<4.0 HTA	----	----	----	----
Methylthiophene, 3-	616-44-4	EC630/WT	16	µg/m³		<16	----	----	----	----
Methylthiophene, 3-	616-44-4	E630/WT	4.0	ppbv		<4.0 HTA	----	----	----	----
n-Butyl mercaptan	109-79-5	EC630/WT	15	µg/m³		<15	----	----	----	----
n-Butyl mercaptan	109-79-5	E630/WT	4.0	ppbv		<4.0 HTA	----	----	----	----
Propyl mercaptan	107-03-9	EC630/WT	12	µg/m³		<12	----	----	----	----
Propyl mercaptan	107-03-9	E630/WT	4.0	ppbv		<4.0 HTA	----	----	----	----
sec-butyl mercaptan + thiophene	----	EC630/WT	14	µg/m³		<21	----	----	----	----
sec-butyl mercaptan + thiophene	----	E630/WT	6.0	ppbv		<6.0 HTA	----	----	----	----
t-Butyl mercaptan	75-66-1	EC630/WT	15	µg/m³		<15	----	----	----	----
t-Butyl mercaptan	75-66-1	E630/WT	4.0	ppbv		<4.0 HTA	----	----	----	----
Tetrahydrothiophene	110-01-0	EC630/WT	14	µg/m³		<14	----	----	----	----
Tetrahydrothiophene	110-01-0	E630/WT	4.0	ppbv		<4.0 HTA	----	----	----	----
Sulfur, total reduced (as H2S), 10 compounds	----	EC630/WT	16	µg/m³		427	----	----	----	----
Sulfur, total reduced (as H2S), 22 compounds	----	EC630/WT	25	µg/m³		427	----	----	----	----
Sulfur, total reduced (as H2S), NPRI 6	----	EC630/WT	12	µg/m³		427	----	----	----	----
Sulfur, total reduced (as H2S), Ontario 4	----	EC630/WT	11	µg/m³		19	----	----	----	----
Permanent Gases										
Methane	74-82-8	E629B-H/WT	0.050	%		<0.050	----	----	----	----

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

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

ALS Canada Ltd.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2402552**	Page	: 1 of 5
Client	: **Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Fort St. John
Contact	: Andrea McMillan	Account Manager	: Brent Mack
Address	: 110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: ----	Telephone	: 778-370-3279
Project	: 704-ENW.GENV03704-02	Date Samples Received	: 23-Aug-2024 13:00
PO	: ----	Issue Date	: 05-Sep-2024 09:46
C-O-C number	: ----		
Sampler	: Fahim Nazari		
Site	: ----		
Quote number	: VA24-EBAE100-013		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Air**

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
Field Tests : Air Canister Information										
Canister LOCATION 2 AIR	EF001	23-Aug-2024	----	----	----		03-Sep-2024	----	11 days	
Permanent Gases : Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)										
Canister LOCATION 2 AIR	E629B-H	23-Aug-2024	----	----	----		04-Sep-2024	30 days	12 days	✓
Sulfur Compounds : Reduced Sulfur Compounds in Passivated Canisters by GC-SCD (All List) (ppbV)										
Canister LOCATION 2 AIR	E630	23-Aug-2024	----	----	----		04-Sep-2024	7 days	11 days	× EHT

Legend & Qualifier Definitions

EHT: Exceeded ALS recommended hold time prior to analysis.

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: **Air**

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)							
Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)	E629B-H	1631955	1	1	100.0	5.0	✓
Reduced Sulfur Compounds in Passivated Canisters by GC-SCD (All List) (ppbV)	E630	1631263	1	1	100.0	5.0	✓
Laboratory Control Samples (LCS)							
Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)	E629B-H	1631955	1	1	100.0	5.0	✓
Reduced Sulfur Compounds in Passivated Canisters by GC-SCD (All List) (ppbV)	E630	1631263	1	1	100.0	5.0	✓
Method Blanks (MB)							
Air Canister Information	EF001	1629916	1	9	11.1	5.0	✓
Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)	E629B-H	1631955	1	1	100.0	5.0	✓
Reduced Sulfur Compounds in Passivated Canisters by GC-SCD (All List) (ppbV)	E630	1631263	1	1	100.0	5.0	✓

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)	E629B-H ALS Environmental - Waterloo	Air	EPA Method 3C & ASTM D1946	This analysis is performed using procedures adapted from EPA Method 3C & ASTM D1946. Air samples are collected into cleaned evacuated canisters. A volume of air is removed from the canister and injected by means of a gas-sampling/backflush valve onto a series of packed GC columns and measured using a thermal conductivity detector (TCD). Oxygen is not separated from Argon. Canister samples will be retained for 7 calendar days after final report. If you require a longer canister storage time, please contact your account manager.
Reduced Sulfur Compounds in Passivated Canisters by GC-SCD (All List) (ppbV)	E630 ALS Environmental - Waterloo	Air	ASTM D5504	This analysis is performed using procedures adapted from ASTM D5504. Air samples are collected into cleaned evacuated silica-coated canisters. By means of a loop system, a volume of air is transferred from the canister and cryofocused before determining the sulfur compounds by GC-SCD. Silica coated passivated canisters may allow for reliable sample analysis after 24 hours. In such cases, analysis is recommended within 7 days of collection. Canister samples will be retained for 7 calendar days after final report. If you require a longer canister storage time, please contact your Project Manager.
Reduced Sulfur Compounds in Passivated Canisters by GC-SCD (All List) (ug/m3)	EC630 ALS Environmental - Waterloo	Air	ASTM D5504	convert ppbv to ug/m3
Air Canister Information	EF001 ALS Environmental - Waterloo	Air	In-house	Air canister information provided by client and recorded on ALS report may affect the validity of results.

QUALITY CONTROL REPORT

Work Order	: **FJ2402552**	Page	: 1 of 5
Client	: Tetra Tech Canada Inc.	Laboratory	: ALS Environmental - Fort St. John
Contact	: Andrea McMillan	Account Manager	: Brent Mack
Address	: 110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: ----	Telephone	: 778-370-3279
Project	: 704-ENW.GENV03704-02	Date Samples Received	: 23-Aug-2024 13:00
PO	: ----	Date Analysis Commenced	: 03-Sep-2024
C-O-C number	: ----	Issue Date	: 05-Sep-2024 09:46
Sampler	: Fahim Nazari		
Site	: ----		
Quote number	: VA24-EBAE100-013		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- 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*
David Tremblett	VOC Section Supervisor	Waterloo Air Quality, Waterloo, Ontario
Sarah Birch	VOC Section Supervisor	Waterloo Air Quality, Waterloo, Ontario

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: **Air**

					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
Sulfur Compounds (QC Lot: 1631263)											
FJ2402552-001	LOCATION 2 AIR	Carbon disulfide	75-15-0	E630	2.0	ppbv	45.7	45.9	0.389%	30%	----
		Carbonyl sulfide	463-58-1	E630	4.0	ppbv	247	248	0.451%	30%	----
		Diethyl disulfide	110-81-6	E630	2.0	ppbv	<2.0	<2.0	0	Diff <2x LOR	----
		Diethyl sulfide	352-93-2	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Dimethyl disulfide	624-92-0	E630	2.0	ppbv	<2.0	<2.0	0	Diff <2x LOR	----
		Dimethyl sulfide	75-18-3	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Dimethylthiophene, 2,5-	638-02-8	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Ethyl mercaptan	75-08-1	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Ethyl methyl sulfide	624-89-5	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Ethylthiophene, 2-	872-55-9	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Hydrogen sulfide	7783-06-4	E630	4.0	ppbv	13.5	12.3	1.2	Diff <2x LOR	----
		Isobutyl mercaptan	513-44-0	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Isopropyl mercaptan	75-33-2	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Methyl mercaptan	74-93-1	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Methylthiophene, 2-	554-14-3	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Methylthiophene, 3-	616-44-4	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		n-Butyl mercaptan	109-79-5	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Propyl mercaptan	107-03-9	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		sec-butyl mercaptan + thiophene	----	E630	6.0	ppbv	<6.0	<6.0	0	Diff <2x LOR	----
		t-Butyl mercaptan	75-66-1	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Tetrahydrothiophene	110-01-0	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
Permanent Gases (QC Lot: 1631955)											
FJ2402552-001	LOCATION 2 AIR	Methane	74-82-8	E629B-H	0.050	%	<0.050	<0.050	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: **Air**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Field Tests (QCLot: 1629916)						
Pressure on receipt	----	EF001	0.1	Inches Hg	-30.0	----
Sulfur Compounds (QCLot: 1631263)						
Carbon disulfide	75-15-0	E630	2	ppbv	<2.0	----
Carbonyl sulfide	463-58-1	E630	4	ppbv	<4.0	----
Diethyl disulfide	110-81-6	E630	2	ppbv	<2.0	----
Diethyl sulfide	352-93-2	E630	4	ppbv	<4.0	----
Dimethyl disulfide	624-92-0	E630	2	ppbv	<2.0	----
Dimethyl sulfide	75-18-3	E630	4	ppbv	<4.0	----
Dimethylthiophene, 2,5-	638-02-8	E630	4	ppbv	<4.0	----
Ethyl mercaptan	75-08-1	E630	4	ppbv	<4.0	----
Ethyl methyl sulfide	624-89-5	E630	4	ppbv	<4.0	----
Ethylthiophene, 2-	872-55-9	E630	4	ppbv	<4.0	----
Hydrogen sulfide	7783-06-4	E630	4	ppbv	<4.0	----
Isobutyl mercaptan	513-44-0	E630	4	ppbv	<4.0	----
Isopropyl mercaptan	75-33-2	E630	4	ppbv	<4.0	----
Methyl mercaptan	74-93-1	E630	4	ppbv	<4.0	----
Methylthiophene, 2-	554-14-3	E630	4	ppbv	<4.0	----
Methylthiophene, 3-	616-44-4	E630	4	ppbv	<4.0	----
n-Butyl mercaptan	109-79-5	E630	4	ppbv	<4.0	----
Propyl mercaptan	107-03-9	E630	4	ppbv	<4.0	----
sec-butyl mercaptan + thiophene	----	E630	6	ppbv	<6.0	----
t-Butyl mercaptan	75-66-1	E630	4	ppbv	<4.0	----
Tetrahydrothiophene	110-01-0	E630	4	ppbv	<4.0	----
Permanent Gases (QCLot: 1631955)						
Methane	74-82-8	E629B-H	0.05	%	<0.050	----

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: **Air**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Sulfur Compounds (QCLot: 1631263)									
Carbonyl sulfide	463-58-1	E630	4	ppbv	104 ppbv	110	60.0	140	----
Hydrogen sulfide	7783-06-4	E630	4	ppbv	112 ppbv	77.9	60.0	140	----
Methyl mercaptan	74-93-1	E630	4	ppbv	101 ppbv	103	60.0	140	----
Permanent Gases (QCLot: 1631955)									
Methane	74-82-8	E629B-H	0.05	%	15 %	104	70.0	130	----

60 NORTHLAND ROAD, UNIT 1
WATERLOO, ON N2V 2B8
Phone: (519) 886-6910
Fax: (519) 886-9047
Toll Free: 1-800-668-9878

ALS Environmental

AIR QUALITY CHAIN OF CUSTODY FORM - Canister/Tube/Gas Bag

Note: All TAT Quoted is in business days which exclude statutory holidays and weekends. TAT of samples received past 3:00 pm or Saturday / Sunday begin the next day.

DATE REQUIRED

SERVICE REQUESTED
- 10 day (regular) ☐
- Rush 5 day (50%) ☐
- Rush 3 day (100%) ☐
- Rush 2 day (200%) ☐
- Rush 1 day (300%) - Enquire ☐

All rush work requires lab approval before sample submission

COMPANY NAME	Tetra Tech
OFFICE	140 Quarry Park Blvd, Calgary
PROJECT MANAGER	Andrea McMillan
PROJECT #	704-ENW.Genv03704-02
PHONE 403-203-3355	FAX
ACCOUNT #	
QUOTATION #	PO # 704-ENW.Genv 03704-02

REGULATION
CRITERIA
OTHER INFORMATION

REPORT FORMAT/DISTRIBUTION

EMAIL ✓ FAX ____ BOTH ____
SELECT: PDF ____ DIGITAL ____ BOTH ____
EMAIL 1 ____
EMAIL 2 ____

SUBMISSION #
ENTERED BY:
DATE/TIME ENTERED:
BIN #:

SAMPLING INFORMATION

ANALYSIS REQUEST

Sample Date/Time: Date (dd-mmm-yy)	Time (24hr) (hh:mm)	Canister or Tube ID# (e.g. 060000-XXXX or G0XXXXXXSVI)	Regulator Serial # CS1200-XXXX or GXX	Matrix Type	SAMPLE DESCRIPTION TO APPEAR ON REPORT	TUBE AIR VOLUME - L ☐ or m³ ☐	Undissolved methane	Undissolved H2S				STARTING PRESSURE - Pre-Sampling ("Hg)	ENDING PRESSURE - Post Sampling ("Hg)	COLLECTION TIME (HRS)	Field Conditions (Rain/Wind/Dust/Odour) Field PID Reading	LAB ID
23-Aug-24	10:48	01400-0339	277	Air	Location 2 Air	*	✓	✓				28	7	4min	normal	

FJAE Shipping & Receiving
___ Call Out ___ Expedite
✓ Priority
1 # of Coolers ___ Air
___ # of Carboys ___ Ground

Environmental Division
Fort St. John
Work Order Reference
FJ2402552

Telephone : +1 250 261 5617

SPECIAL INSTRUCTIONS/COMMENTS

* -> filled to 7Hg pressure
Start Pressure 28 Hg
-> Filled for 4 min.

This Chain of Custody Form is only to be used for Air Quality Samples

Matrix Type
Soil Gas Vapour = SG
Ambient Air = AA
Indoor Air = IA
Industrial Hygiene = IH

COLD ☐
COOLING INITIATED ☐
AMBIENT ☐

SAMPLED BY: Fahim Nazar	DATE & TIME Aug-23-2024	RECEIVED BY:	DATE & TIME	OBSERVATIONS Yes ☐ No ☐ If yes add SIF
RELINQUISHED BY: [redacted]	DATE & TIME	RECEIVED AT LAB BY:	DATE & TIME	INIT

Notes

1. Quote number must be pro[redacted]

2. TAT may vary dependent on complexity of analysis and lab workload at time of submission. Please contact the lab to confirm TATs.

3. Any known or suspected hazards relating to a sample must be noted on the chain of custody in comments section.

REV6-2015

22°C [redacted] Aug 23/24 - 12:00pm.

60 NORTHLAND ROAD, UNIT 1
WATERLOO, ON N2V 2B8
Phone: (519) 886-6910
Fax: (519) 886-9047
Toll Free: 1-800-668-9878

ALS Environmental

AIR QUALITY CHAIN OF CUSTODY FORM - Canister/Tube/Gas Bag

Note: All TAT Quoted is in **business days** which exclude statutory holidays and weekends. TAT of samples received past 3:00 pm or Saturday / Sunday begin the next day.

DATE REQUIRED

SERVICE REQUESTED
- 10 day (regular) ☐
- Rush 5 day (50%) ☐
- Rush 3 day (100%) ☐
- Rush 2 day (200%) ☐
- Rush 1 day (300%) - Enquire ☐

All rush work requires lab approval before sample submission

COMPANY NAME	Tetra Tech
OFFICE	140 Quarry Park Blvd, Calgary
PROJECT MANAGER	Andrea McMillan
PROJECT #	704-ENW.GenV03704-02
PHONE	403-203-3355
FAX	
ACCOUNT #	
QUOTATION #	
PO #	704-ENW.GenV03704-02

REGULATION
CRITERIA
OTHER INFORMATION

REPORT FORMAT/DISTRIBUTION

EMAIL ✓ FAX ____ BOTH ____
SELECT: PDF ____ DIGITAL ____ BOTH ____
EMAIL 1 ____
EMAIL 2 ____

SUBMISSION #:
ENTERED BY:
DATE/TIME ENTERED:
BIN #:

ANALYSIS REQUEST

SAMPLING INFORMATION

Sample Date/Time: Date (dd-mmm-yy)	Time (24hr) (hh:mm)	Canister or Tube ID# (e.g. 060000-XXXX or G0XXXXXXSVI)	Regulator Serial # CS1200-XXXX or GXX	Matrix Type	SAMPLE DESCRIPTION TO APPEAR ON REPORT	TUBE AIR VOLUME - L ☐ or m³ ☐	Undissolved methane	Undissolved H2S	STARTING PRESSURE - Pre-Sampling ("Hg)	ENDING PRESSURE - Post Sampling ("Hg)	COLLECTION TIME (HRS)	Field Conditions (Rain/Wind/Dust/Odour) Field PID Reading	LAB ID
23-Aug-24	10:48	01400-0339	277	Air	Location 2 Air	*	✓	✓	28	7	4 min	normal	

Environmental Division
Fort St. John
Work Order Reference
FJ2402552

Telephone : +1 250 261 5617

FJAE Shipping & Receiving
___ Call Out ___ Expedite
✓ Priority
___ # of Coolers ___ Air
___ # of Carboys ___ Ground

SPECIAL INSTRUCTIONS/COMMENTS

* → filled to 7 Hg pressure
Start Pressure 28 Hg
→ Filled for 4 min.

This Chain of Custody Form is only to be used for Air Quality Samples

Matrix Type
Soil Gas Vapour = SG
Ambient Air = AA
Indoor Air = IA
Industrial Hygiene = IH

COLD ☐
COOLING INITIATED ☐
AMBIENT ☐

SAMPLED BY:	Fahim Nazari	DATE & TIME	Aug-23-2024	
RELINQUISHED BY:	[redacted]	DATE & TIME		
RECEIVED BY:		DATE & TIME		
RECEIVED AT LAB BY:		DATE & TIME		

OBSERVATIONS Yes ☐ No ☐ If yes add SIF
INIT

Notes

1. Quote number must be provided to [redacted]

2. TAT may vary dependent on complexity of analysis and lab workload at time of submission. Please contact the lab to confirm TATs.

3. Any known or suspected hazards relating to a sample must be noted on the chain of custody in comments section.

REV6-2015

22 °C [redacted] Aug 23/24 - 12:00pm.

ALS Environmental
60 Northland Drive, Unit 1
Waterloo, ON
N2V 2B8

AIR SAMPLING MEDIA REQUEST FORM

COMPLETE Blue sections. Grey sections are for INTERNAL USE ONLY
Form MUST be reviewed & initialled by an ALS Account Manager prior to submission to NAWTR AIRMEDIA REQUEST (nawtr.airmediarequest@alsglobal.com)

SHIPPING INFO: pls ship PUROLATOR EXPRESS TODAY 21AUG for delivery 23AUG to ALS FSJ

CLIENT:	TetraTech	ORDER TAKEN BY:	Wendy Sears
CLIENT CONTACT:	Andrea McMillan	ORDER DATE:	21-Aug-24
CLIENT PROJECT/PO:	Gas and GW sampling	AM REVIEWER:	DSTASTNY
QUOTE #: (mandatory)	TetraTech MSA	CLIENT EXPECT DATE:	23-Aug-24
DELIVERY TO:	ALS Fort St John BC, 11007 Alaska Road, Fort St John , BC, V1J 6P3 for client P/U	ORDER FILLED BY:	YB
TELEPHONE NUMBER:	587-830-1121	PEER REVIEWER:	
SHIP TO (include email):	andrea.mcmillan@tetratech.com	DATE COMPLETED:	21-Aug-24

Shipping Method: (Select one)
- [x] o Regular (ALS will cover shipping cost)
- [ ] o RUSH(Client will be billed for shipping costs, please confirm with Account Manager)
- [ ] o External Courier
- [ ] o Pickup at ALS
- [ ] • Location:
- [ ] o ALS Drivers

Shipping Company:
- ( ) o FedEx
- (•) o Purolator
- ( ) o DHL
- ( ) o UPS
- ( ) o Other
- ( ) o N/A

Tracking Number:

Completion of all Sections is Mandatory

1. What type of air is being sampled? ***Check all appropriate types in the Additional Information Box below***
2. Please provide a list of compounds and reporting limits that are required. ***Include regulation & target list (attach to email)***
3. What is your planned canister sampling time? ***Options listed under Regulator Times***
4. Trip blanks will be shipped **pre-filled** unless specifically requested below

Note: If analysis required is DIFFERENT than what is LISTED on this form, email nawtr.airmediarequest@alsglobal.com ASAP to confirm the media was adequately proofed.

Canister Size/Tube		Regulator Times	Regulator Quantity	Parameters/ Product Codes	Canister/Tube Identification #	Initial Pressure/Flow (mmHg/mL per min)	Controller Identification #
6L Canister		24 hr					
		12 hr					
		8 hr					
		4 hr					
		1 hr					
		0.5 hr					
Number of Canisters		Trip Blank					
1.4L Canister		60 mins		Methane, S629M, Full Sulfur Scan S630	01400-0339	-28.7	G165
		20 mins					
		10 mins					
		4 mins	1				
		No Restrictor					
Number of Canisters	1	Trip Blank					
Bottle Vacs		40 mins					
		14 mins					
		7 mins					
		3 mins					
		No Restrictor					
Number of Canisters		Trip Blank					
Passive CarboPak X Tubes							
Diffusive Caps							
Active SVI Tubes							
Calibration Tube for SVI (yes/no)							

Other Sampling Supplies	Quantity	ID #
Pressure Gauge	1	PG28
Caplok Tool		
Canister Stands		
Valve Adaptor for Soil Vapour		

Chargeable Supplies		Quantity
Duplicate Sampler - $45 canister		
Valve Adaptor for Soil Vapour $5		
Teflon Tubing - $3 per foot	-Total length (ft)	
	-Length per section (ft)	
Nut & Ferrule Sets - $8 per set		
Tedlar Bags (contact the lab before SUBMITTING)	-$28 unpurged	
	-$45 purged	
Siloxane Kit - $100 each (Kit: $50, TD tube prep/rental: $50)		
Rush Order Prep Charge (<48 hour notice, not including shipping)		$50
Include sampling supplies from other ALS location (yes/no) SEE COMMENTS		

Additional Information & Special Instructions or Requests

Check all that apply:
- [ ] Indoor Air
- [ ] Sub-Slab
- [ ] Industrial
- [x] Ambient Air
- [ ] Landfill
- [ ] Commercial
- [ ] Probe/Well
- [ ] Crawlspace
- [ ] Residential
- [ ] Other (specify):

COMMENTS:
Methane :$100, Sulfurs $242, Canister 2WEEK rental $105

RENTAL COSTS: Canister Rental is 2 WEEKS only. After this time additional rental fees apply.

MEDIA REPLACEMENT COSTS: *(Media lost or damaged will be charged to the client)*

1) TD SORBENT TUBE & CAPS - $180.00 2) TD DIFFUSION CAP - $30.00 3) CAPLOK TOOL SET - $85.00 4) VACUUM GAUGE - $240.00 5) BOTTLEVAC CANISTER - $135.00
6) PROTECTIVE CAP- $35.00 7) CANISTER - 6L: $850.00; 1.4L: $450.00 8) CONTROLLER - TWA: $1000.00 GRAB: $850.00 9) CANISTER STAND - $75.00 10) DUPLICATE SAMPLER - $550.00

ALS Canada Ltd.

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2402712**	Page	: 1 of 9
Client	: **Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Fort St. John
Contact	: Andrea McMillan	Account Manager	: Brent Mack
Address	: 110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: ----	Telephone	: 778-370-3279
Project	: 704-ENW.GENV03704-02- Rose Prairie	Date Samples Received	: 09-Sep-2024 13:10
PO	: ----	Date Analysis Commenced	: 11-Sep-2024
C-O-C number	: ----	Issue Date	: 17-Sep-2024 16:02
Sampler	: Thomas Kolb		
Site	: ----		
Quote number	: VA24-EBAE100-013		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results
- Surrogate Control Limits

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Daniel Shabestani	Lab Assistant	Metals, Burnaby, British Columbia
David Tremblett	VOC Section Supervisor	Air Quality, Waterloo, Ontario
Elke Tabora	Lab Analyst	Inorganics, Calgary, Alberta
Janice Leung	Supervisor - Organics Instrumentation	Organics, Burnaby, British Columbia
Kate Dimitrova	Supervisor - Inorganic	Inorganics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Metals, 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
Maya Urquhart	Lab Analyst	Metals, Burnaby, British Columbia
Monica Ko	Lab Assistant	Inorganics, Burnaby, British Columbia
Owen Cheng		Metals, Burnaby, British Columbia
Walt Kippenhuck	Supervisor - Inorganic	Inorganics, Waterloo, Ontario

General Comments

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

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

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

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

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	no units
% T/cm	% transmittance per centimetre
µg/L	micrograms per litre
µS/cm	microsiemens per centimetre
AU/cm	absorbance units per centimetre
CU	colour units (1 cu = 1 mg/l pt)
mg/L	milligrams per litre
NTU	nephelometric turbidity units
pH units	pH units
ppmv	parts per million (volume/volume)

<: 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.

Workorder Comments

No container received for F2 analysis, but requested on Chain of Custody / analytical request form; subsample cannot be obtained from other containers to meet request. The requested analysis cannot be performed.

Qualifiers

Qualifier	*Description*
DLA	*Detection Limit adjusted for required dilution.*

DLDS	*Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.*

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	LOCATION 3	----	----	----	----
					Client sampling date / time	09-Sep-2024 11:07	----	----	----	----
					FJ2402712-001	--------	--------	--------	--------	
					Result	----	----	----	----	
Physical Tests										
Absorbance, UV (@ 254nm)	----	E404/VA	0.0050	AU/cm		0.0620	----	----	----	----
Alkalinity, bicarbonate (as CaCO3)	----	E290/VA	1.0	mg/L		861	----	----	----	----
Alkalinity, carbonate (as CaCO3)	----	E290/VA	1.0	mg/L		20.8	----	----	----	----
Alkalinity, hydroxide (as CaCO3)	----	E290/VA	1.0	mg/L		<1.0	----	----	----	----
Alkalinity, phenolphthalein (as CaCO3)	----	E290/VA	1.0	mg/L		10.4	----	----	----	----
Alkalinity, total (as CaCO3)	----	E290/VA	1.0	mg/L		882	----	----	----	----
Colour, true	----	E329/VA	5.0	CU		<5.0	----	----	----	----
Conductivity	----	E100/VA	2.0	µS/cm		1800	----	----	----	----
Hardness (as CaCO3), dissolved	----	EC100/VA	0.60	mg/L		353	----	----	----	----
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/VA	0.60	mg/L		350	----	----	----	----
pH	----	E108/VA	0.10	pH units		8.39	----	----	----	----
Solids, total dissolved [TDS]	----	E162/VA	10	mg/L		1340	----	----	----	----
Turbidity	----	E121/VA	0.10	NTU		316	----	----	----	----
Transmittance, UV (@ 254nm)	----	E404/VA	1.0	% T/cm		86.7	----	----	----	----
Anions and Nutrients										
Bromide	24959-67-9	E235.Br-L/VA	0.050	mg/L		<0.500 DLDS	----	----	----	----
Chloride	16887-00-6	E235.Cl/VA	0.50	mg/L		38.8	----	----	----	----
Fluoride	16984-48-8	E235.F/VA	0.020	mg/L		<0.200 DLDS	----	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	0.0050	mg/L		<0.0500 DLDS	----	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	0.0010	mg/L		<0.0100 DLDS	----	----	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/VA	0.30	mg/L		136	----	----	----	----
Cyanides										
Cyanide, strong acid dissociable (Total)	----	E333/WT	0.0050	mg/L		<0.0050	----	----	----	----
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/CG	0.50	mg/L		3.37	----	----	----	----
Carbon, total organic [TOC]	----	E355-L/CG	0.50	mg/L		7.25	----	----	----	----
Total Sulfides										
Sulfide, total (as H2S)	7783-06-4	E395-H/VA	0.011	mg/L		<0.011	----	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	LOCATION 3	----	----	----	----
					Client sampling date / time	09-Sep-2024 11:07	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		FJ2402712-001	--------	--------	--------	--------
						Result	----	----	----	----
Total Sulfides										
Sulfide, total (as S)	18496-25-8	E395-H/VA	0.010	mg/L		<0.010	----	----	----	----
Total Metals										
Aluminum, total	7429-90-5	E420/VA	0.0030	mg/L		3.14	----	----	----	----
Antimony, total	7440-36-0	E420/VA	0.00010	mg/L		0.00099	----	----	----	----
Arsenic, total	7440-38-2	E420/VA	0.00010	mg/L		0.00362	----	----	----	----
Barium, total	7440-39-3	E420/VA	0.00010	mg/L		0.206	----	----	----	----
Beryllium, total	7440-41-7	E420/VA	0.000100	mg/L		0.000213	----	----	----	----
Bismuth, total	7440-69-9	E420/VA	0.000050	mg/L		<0.000100 DLA	----	----	----	----
Boron, total	7440-42-8	E420/VA	0.010	mg/L		0.319	----	----	----	----
Cadmium, total	7440-43-9	E420/VA	0.0000050	mg/L		0.000318	----	----	----	----
Calcium, total	7440-70-2	E420/VA	0.050	mg/L		55.3	----	----	----	----
Cesium, total	7440-46-2	E420/VA	0.000010	mg/L		0.00153	----	----	----	----
Chromium, total	7440-47-3	E420/VA	0.00050	mg/L		0.00817	----	----	----	----
Cobalt, total	7440-48-4	E420/VA	0.00010	mg/L		0.00341	----	----	----	----
Copper, total	7440-50-8	E420/VA	0.00050	mg/L		0.0134	----	----	----	----
Iron, total	7439-89-6	E420/VA	0.010	mg/L		18.8	----	----	----	----
Lead, total	7439-92-1	E420/VA	0.000050	mg/L		0.00562	----	----	----	----
Lithium, total	7439-93-2	E420/VA	0.0010	mg/L		0.0228	----	----	----	----
Magnesium, total	7439-95-4	E420/VA	0.0050	mg/L		51.4	----	----	----	----
Manganese, total	7439-96-5	E420/VA	0.00010	mg/L		0.251	----	----	----	----
Mercury, total	7439-97-6	E508/VA	0.0000050	mg/L		0.0000608	----	----	----	----
Molybdenum, total	7439-98-7	E420/VA	0.000050	mg/L		0.00397	----	----	----	----
Nickel, total	7440-02-0	E420/VA	0.00050	mg/L		0.0120	----	----	----	----
Phosphorus, total	7723-14-0	E420/VA	0.050	mg/L		0.140	----	----	----	----
Potassium, total	7440-09-7	E420/VA	0.050	mg/L		4.60	----	----	----	----
Rubidium, total	7440-17-7	E420/VA	0.00020	mg/L		0.00991	----	----	----	----
Selenium, total	7782-49-2	E420/VA	0.000050	mg/L		0.00190	----	----	----	----
Silicon, total	7440-21-3	E420/VA	0.10	mg/L		10.0	----	----	----	----
Silver, total	7440-22-4	E420/VA	0.000010	mg/L		0.000122	----	----	----	----
Sodium, total	7440-23-5	E420/VA	0.050	mg/L		362	----	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	LOCATION 3	----	----	----	----
					Client sampling date / time	09-Sep-2024 11:07	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		FJ2402712-001	--------	--------	--------	--------
						Result	----	----	----	----
Total Metals										
Strontium, total	7440-24-6	E420/VA	0.00020	mg/L		1.04	----	----	----	----
Sulfur, total	7704-34-9	E420/VA	0.50	mg/L		57.8	----	----	----	----
Tellurium, total	13494-80-9	E420/VA	0.00020	mg/L		<0.00040 DLA	----	----	----	----
Thallium, total	7440-28-0	E420/VA	0.000010	mg/L		0.000088	----	----	----	----
Thorium, total	7440-29-1	E420/VA	0.00010	mg/L		0.00150	----	----	----	----
Tin, total	7440-31-5	E420/VA	0.00010	mg/L		<0.00020 DLA	----	----	----	----
Titanium, total	7440-32-6	E420/VA	0.00030	mg/L		0.0187	----	----	----	----
Tungsten, total	7440-33-7	E420/VA	0.00010	mg/L		<0.00020 DLA	----	----	----	----
Uranium, total	7440-61-1	E420/VA	0.000010	mg/L		0.00179	----	----	----	----
Vanadium, total	7440-62-2	E420/VA	0.00050	mg/L		0.0118	----	----	----	----
Zinc, total	7440-66-6	E420/VA	0.0030	mg/L		0.0767	----	----	----	----
Zirconium, total	7440-67-7	E420/VA	0.00020	mg/L		<0.00040 DLA	----	----	----	----
Dissolved Metals										
Aluminum, dissolved	7429-90-5	E421/VA	0.0010	mg/L		0.0078	----	----	----	----
Antimony, dissolved	7440-36-0	E421/VA	0.00010	mg/L		0.00091	----	----	----	----
Arsenic, dissolved	7440-38-2	E421/VA	0.00010	mg/L		0.00090	----	----	----	----
Barium, dissolved	7440-39-3	E421/VA	0.00010	mg/L		0.0483	----	----	----	----
Beryllium, dissolved	7440-41-7	E421/VA	0.000100	mg/L		<0.000100	----	----	----	----
Bismuth, dissolved	7440-69-9	E421/VA	0.000050	mg/L		<0.000050	----	----	----	----
Boron, dissolved	7440-42-8	E421/VA	0.010	mg/L		0.371	----	----	----	----
Cadmium, dissolved	7440-43-9	E421/VA	0.0000050	mg/L		0.0000304	----	----	----	----
Calcium, dissolved	7440-70-2	E421/VA	0.050	mg/L		62.6	----	----	----	----
Cesium, dissolved	7440-46-2	E421/VA	0.000010	mg/L		0.000053	----	----	----	----
Chromium, dissolved	7440-47-3	E421/VA	0.00050	mg/L		<0.00050	----	----	----	----
Cobalt, dissolved	7440-48-4	E421/VA	0.00010	mg/L		0.00048	----	----	----	----
Copper, dissolved	7440-50-8	E421/VA	0.00020	mg/L		<0.00020	----	----	----	----
Iron, dissolved	7439-89-6	E421/VA	0.010	mg/L		0.178	----	----	----	----
Lead, dissolved	7439-92-1	E421/VA	0.000050	mg/L		<0.000050	----	----	----	----
Lithium, dissolved	7439-93-2	E421/VA	0.0010	mg/L		0.0206	----	----	----	----
Magnesium, dissolved	7439-95-4	E421/VA	0.0050	mg/L		47.7	----	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	LOCATION 3	----	----	----	----
					Client sampling date / time	09-Sep-2024 11:07	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		FJ2402712-001	--------	--------	--------	--------
						Result	----	----	----	----
Dissolved Metals										
Manganese, dissolved	7439-96-5	E421/VA	0.00010	mg/L		0.110	----	----	----	----
Mercury, dissolved	7439-97-6	E509/VA	0.0000050	mg/L		<0.0000050	----	----	----	----
Molybdenum, dissolved	7439-98-7	E421/VA	0.000050	mg/L		0.00392	----	----	----	----
Nickel, dissolved	7440-02-0	E421/VA	0.00050	mg/L		0.00152	----	----	----	----
Phosphorus, dissolved	7723-14-0	E421/VA	0.050	mg/L		<0.050	----	----	----	----
Potassium, dissolved	7440-09-7	E421/VA	0.050	mg/L		4.40	----	----	----	----
Rubidium, dissolved	7440-17-7	E421/VA	0.00020	mg/L		0.00240	----	----	----	----
Selenium, dissolved	7782-49-2	E421/VA	0.000050	mg/L		0.00176	----	----	----	----
Silicon, dissolved	7440-21-3	E421/VA	0.050	mg/L		4.86	----	----	----	----
Silver, dissolved	7440-22-4	E421/VA	0.000010	mg/L		<0.000010	----	----	----	----
Sodium, dissolved	7440-23-5	E421/VA	0.050	mg/L		360	----	----	----	----
Strontium, dissolved	7440-24-6	E421/VA	0.00020	mg/L		0.994	----	----	----	----
Sulfur, dissolved	7704-34-9	E421/VA	0.50	mg/L		51.0	----	----	----	----
Tellurium, dissolved	13494-80-9	E421/VA	0.00020	mg/L		<0.00020	----	----	----	----
Thallium, dissolved	7440-28-0	E421/VA	0.000010	mg/L		<0.000010	----	----	----	----
Thorium, dissolved	7440-29-1	E421/VA	0.00010	mg/L		<0.00010	----	----	----	----
Tin, dissolved	7440-31-5	E421/VA	0.00010	mg/L		<0.00010	----	----	----	----
Titanium, dissolved	7440-32-6	E421/VA	0.00030	mg/L		<0.00030	----	----	----	----
Tungsten, dissolved	7440-33-7	E421/VA	0.00010	mg/L		<0.00010	----	----	----	----
Uranium, dissolved	7440-61-1	E421/VA	0.000010	mg/L		0.00141	----	----	----	----
Vanadium, dissolved	7440-62-2	E421/VA	0.00050	mg/L		<0.00050	----	----	----	----
Zinc, dissolved	7440-66-6	E421/VA	0.0010	mg/L		0.0022	----	----	----	----
Zirconium, dissolved	7440-67-7	E421/VA	0.00020	mg/L		0.00035	----	----	----	----
Dissolved mercury filtration location	----	EP509/VA	-	-		Field	----	----	----	----
Dissolved metals filtration location	----	EP421/VA	-	-		Field	----	----	----	----
Dissolved Gases										
Methane	74-82-8	EC614B/WT	5.0	µg/L		<5.0	----	----	----	----
Methane	74-82-8	E614B/WT	20.8	ppmv		<20.8	----	----	----	----
Volatile Organic Compounds [Fuels]										
Benzene	71-43-2	E611A/VA	0.50	µg/L		<0.50	----	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	LOCATION 3	----	----	----	----
					Client sampling date / time	09-Sep-2024 11:07	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		FJ2402712-001	--------	--------	--------	--------
						Result	----	----	----	----
Volatile Organic Compounds [Fuels]										
Ethylbenzene	100-41-4	E611A/VA	0.50	µg/L		<0.50	----	----	----	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611A/VA	0.50	µg/L		<0.50	----	----	----	----
Styrene	100-42-5	E611A/VA	0.50	µg/L		<0.50	----	----	----	----
Toluene	108-88-3	E611A/VA	0.50	µg/L		<0.50	----	----	----	----
Xylene, m+p-	179601-23-1	E611A/VA	0.40	µg/L		<0.40	----	----	----	----
Xylene, o-	95-47-6	E611A/VA	0.30	µg/L		<0.30	----	----	----	----
Xylenes, total	1330-20-7	E611A/VA	0.50	µg/L		<0.50	----	----	----	----
Hydrocarbons										
VHw (C6-C10)	----	E581.VH+F1/VA	100	µg/L		<100	----	----	----	----
F1-BTEX	----	EC580/VA	100	µg/L		<100	----	----	----	----
VPHw	----	EC580A/VA	100	µg/L		<100	----	----	----	----
F1 (C6-C10)	----	E581.VH+F1/VA	100	µg/L		<100	----	----	----	----
Hydrocarbons Surrogates										
Dichlorotoluene, 3,4-	95-75-0	E581.VH+F1/VA	1.0	%		73.2	----	----	----	----
Volatile Organic Compounds Surrogates										
Bromofluorobenzene, 4-	460-00-4	E611A/VA	1.0	%		83.7	----	----	----	----
Difluorobenzene, 1,4-	540-36-3	E611A/VA	1.0	%		116	----	----	----	----

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

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

ALS Canada Ltd.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2402712**	Page	: 1 of 13
Client	: **Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Fort St. John
Contact	: Andrea McMillan	Account Manager	: Brent Mack
Address	: 110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: ----	Telephone	: 778-370-3279
Project	: 704-ENW.GENV03704-02- Rose Prairie	Date Samples Received	: 09-Sep-2024 13:10
PO	: ----	Issue Date	: 17-Sep-2024 16:02
C-O-C number	: ----		
Sampler	: Thomas Kolb		
Site	: ----		
Quote number	: VA24-EBAE100-013		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

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

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Outliers : Quality Control Samples

Duplicates, Method Blanks, Laboratory Control Samples and Matrix Spikes

Matrix: **Water**

Analyte Group	Laboratory sample ID	Client/Ref Sample ID	Analyte	CAS Number	Method	Result	Limits	Comment
Matrix Spike (MS) Recoveries								
Dissolved Metals	FJ2402712-001	LOCATION 3	Silver, dissolved	7440-22-4	E421	62.2 % MES	70.0-130%	Recovery less than lower data quality objective

Result Qualifiers

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

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Water**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE LOCATION 3	E235.Br-L	09-Sep-2024	11-Sep-2024	28 days	2 days	✓	11-Sep-2024	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE LOCATION 3	E235.Cl	09-Sep-2024	11-Sep-2024	28 days	2 days	✓	11-Sep-2024	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE LOCATION 3	E235.F	09-Sep-2024	11-Sep-2024	28 days	2 days	✓	11-Sep-2024	28 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE LOCATION 3	E235.NO3-L	09-Sep-2024	11-Sep-2024	3 days	2 days	✓	11-Sep-2024	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE LOCATION 3	E235.NO2-L	09-Sep-2024	11-Sep-2024	3 days	2 days	✓	11-Sep-2024	3 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE LOCATION 3	E235.SO4	09-Sep-2024	11-Sep-2024	28 days	2 days	✓	11-Sep-2024	28 days	2 days	✓
Cyanides : Total Cyanide										
UV-inhibited HDPE - total (sodium hydroxide) LOCATION 3	E333	09-Sep-2024	12-Sep-2024	14 days	3 days	✓	12-Sep-2024	14 days	3 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	
Dissolved Gases : Methane, Ethane, & Ethene by Headspace GC-FID										
Glass vial (sodium bisulfate)										
LOCATION 3	E614B	09-Sep-2024	----	----	----		13-Sep-2024	14 days	4 days	✓
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
LOCATION 3	E509	09-Sep-2024	16-Sep-2024	28 days	8 days	✓	16-Sep-2024	28 days	8 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
LOCATION 3	E421	09-Sep-2024	14-Sep-2024	180 days	5 days	✓	16-Sep-2024	180 days	7 days	✓
Hydrocarbons : VH and F1 by Headspace GC-FID										
Glass vial (sodium bisulfate)										
LOCATION 3	E581.VH+F1	09-Sep-2024	13-Sep-2024	14 days	4 days	✓	13-Sep-2024	14 days	4 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
LOCATION 3	E358-L	09-Sep-2024	15-Sep-2024	28 days	6 days	✓	16-Sep-2024	28 days	7 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (sulfuric acid)										
LOCATION 3	E355-L	09-Sep-2024	15-Sep-2024	28 days	6 days	✓	16-Sep-2024	28 days	7 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
LOCATION 3	E290	09-Sep-2024	11-Sep-2024	14 days	2 days	✓	13-Sep-2024	14 days	4 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE										
LOCATION 3	E329	09-Sep-2024	11-Sep-2024	3 days	2 days	✓	11-Sep-2024	3 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE										
LOCATION 3	E100	09-Sep-2024	11-Sep-2024	28 days	2 days	✓	13-Sep-2024	28 days	4 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 : pH by Meter										
HDPE LOCATION 3	E108	09-Sep-2024	11-Sep-2024	0.25 hrs	42 hrs	× EHTR-FM	13-Sep-2024	0.25 hrs	98 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE LOCATION 3	E162	09-Sep-2024	----	----	----		15-Sep-2024	7 days	6 days	✓
Physical Tests : Turbidity by Nephelometry										
HDPE LOCATION 3	E121	09-Sep-2024	----	----	----		12-Sep-2024	3 days	3 days	✓
Physical Tests : UV Absorbance and Transmittance by Spectrometry										
HDPE LOCATION 3	E404	09-Sep-2024	----	----	----		12-Sep-2024	3 days	3 days	✓
Total Metals : Total Mercury in Water by CVAAS										
Glass vial total (hydrochloric acid) LOCATION 3	E508	09-Sep-2024	16-Sep-2024	28 days	7 days	✓	16-Sep-2024	28 days	7 days	✓
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE total (nitric acid) LOCATION 3	E420	09-Sep-2024	13-Sep-2024	180 days	4 days	✓	15-Sep-2024	180 days	6 days	✓
Total Sulfides : Total Sulfide by Colourimetry (Automated Flow)										
HDPE total (zinc acetate+sodium hydroxide) LOCATION 3	E395-H	09-Sep-2024	----	----	----		12-Sep-2024	7 days	3 days	✓
Volatile Organic Compounds : BTEX by Headspace GC-MS										
Glass vial (sodium bisulfate) LOCATION 3	E611A	09-Sep-2024	13-Sep-2024	14 days	4 days	✓	13-Sep-2024	14 days	4 days	✓

Legend & Qualifier Definitions

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

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

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	1644011	1	18	5.5	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	1644017	1	13	7.6	5.0	✓
BTEX by Headspace GC-MS	E611A	1648980	1	14	7.1	5.0	✓
Chloride in Water by IC	E235.Cl	1644016	1	15	6.6	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	1644020	1	1	100.0	5.0	✓
Conductivity in Water	E100	1644009	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1654684	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1645007	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1652740	1	15	6.6	5.0	✓
Fluoride in Water by IC	E235.F	1644015	1	13	7.6	5.0	✓
Methane, Ethane, & Ethene by Headspace GC-FID	E614B	1649070	1	11	9.0	4.5	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1644013	1	18	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1644014	1	15	6.6	5.0	✓
pH by Meter	E108	1644010	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1644012	1	15	6.6	5.0	✓
TDS by Gravimetry	E162	1652612	1	19	5.2	5.0	✓
Total Cyanide	E333	1648080	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	1654017	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1647732	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1652739	1	15	6.6	5.0	✓
Total Sulfide by Colourimetry (Automated Flow)	E395-H	1647389	1	8	12.5	5.0	✓
Turbidity by Nephelometry	E121	1646854	1	20	5.0	5.0	✓
UV Absorbance and Transmittance by Spectrometry	E404	1646857	1	2	50.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	1648981	1	11	9.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	1644011	1	18	5.5	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	1644017	1	13	7.6	5.0	✓
BTEX by Headspace GC-MS	E611A	1648980	1	14	7.1	5.0	✓
Chloride in Water by IC	E235.Cl	1644016	1	15	6.6	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	1644020	1	1	100.0	5.0	✓
Conductivity in Water	E100	1644009	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1654684	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1645007	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1652740	1	15	6.6	5.0	✓
Fluoride in Water by IC	E235.F	1644015	1	13	7.6	5.0	✓
Methane, Ethane, & Ethene by Headspace GC-FID	E614B	1649070	1	11	9.0	4.5	✓

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							
Nitrate in Water by IC (Low Level)	E235.NO3-L	1644013	1	18	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1644014	1	15	6.6	5.0	✓
pH by Meter	E108	1644010	1	20	5.0	5.0	✓
Sulfate in Water by IC	E235.SO4	1644012	1	15	6.6	5.0	✓
TDS by Gravimetry	E162	1652612	1	19	5.2	5.0	✓
Total Cyanide	E333	1648080	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	1654017	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1647732	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1652739	1	15	6.6	5.0	✓
Total Sulfide by Colourimetry (Automated Flow)	E395-H	1647389	1	8	12.5	5.0	✓
Turbidity by Nephelometry	E121	1646854	1	20	5.0	5.0	✓
UV Absorbance and Transmittance by Spectrometry	E404	1646857	1	2	50.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	1648981	1	11	9.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	1644011	1	18	5.5	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	1644017	1	13	7.6	5.0	✓
BTEX by Headspace GC-MS	E611A	1648980	1	14	7.1	5.0	✓
Chloride in Water by IC	E235.Cl	1644016	1	15	6.6	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	1644020	1	1	100.0	5.0	✓
Conductivity in Water	E100	1644009	1	20	5.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1654684	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1645007	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1652740	1	15	6.6	5.0	✓
Fluoride in Water by IC	E235.F	1644015	1	13	7.6	5.0	✓
Methane, Ethane, & Ethene by Headspace GC-FID	E614B	1649070	1	11	9.0	4.5	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1644013	1	18	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1644014	1	15	6.6	5.0	✓
Sulfate in Water by IC	E235.SO4	1644012	1	15	6.6	5.0	✓
TDS by Gravimetry	E162	1652612	1	19	5.2	5.0	✓
Total Cyanide	E333	1648080	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	1654017	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1647732	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1652739	1	15	6.6	5.0	✓
Total Sulfide by Colourimetry (Automated Flow)	E395-H	1647389	1	8	12.5	5.0	✓
Turbidity by Nephelometry	E121	1646854	1	20	5.0	5.0	✓
UV Absorbance and Transmittance by Spectrometry	E404	1646857	1	2	50.0	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	1648981	1	11	9.0	5.0	✓
Matrix Spikes (MS)							
Bromide in Water by IC (Low Level)	E235.Br-L	1644017	1	13	7.6	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							
BTEX by Headspace GC-MS	E611A	1648980	1	14	7.1	5.0	✓
Chloride in Water by IC	E235.Cl	1644016	1	15	6.6	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1654684	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1645007	1	20	5.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1652740	1	15	6.6	5.0	✓
Fluoride in Water by IC	E235.F	1644015	1	13	7.6	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1644013	1	18	5.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1644014	1	15	6.6	5.0	✓
Sulfate in Water by IC	E235.SO4	1644012	1	15	6.6	5.0	✓
Total Cyanide	E333	1648080	1	20	5.0	5.0	✓
Total Mercury in Water by CVAAS	E508	1654017	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1647732	1	20	5.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1652739	1	15	6.6	5.0	✓
Total Sulfide by Colourimetry (Automated Flow)	E395-H	1647389	1	8	12.5	5.0	✓
VH and F1 by Headspace GC-FID	E581.VH+F1	1648981	1	11	9.0	5.0	✓

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 ALS Environmental - Vancouver	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 ALS Environmental - Vancouver	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 ALS Environmental - Vancouver	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
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.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
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.
Colour (True) by Spectrometer (5 CU)	E329 ALS Environmental - Vancouver	Water	APHA 2120 C (mod)	Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment.
Total Cyanide	E333 ALS Environmental - Waterloo	Water	ISO 14403 (mod)	Total or Strong Acid Dissociable (SAD) Cyanide is determined by Continuous Flow Analyzer (CFA) with in-line UV digestion followed by colourmetric analysis. Method Limitation: High levels of thiocyanate (SCN) may cause positive interference (up to 0.5% of SCN concentration).
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L ALS Environmental - Calgary	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L ALS Environmental - Calgary	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Sulfide by Colourimetry (Automated Flow)	E395-H ALS Environmental - Vancouver	Water	APHA 4500 -S E-Auto-Colorimetry	Sulfide is determined using the gas dialysis automated methlyene blue colourimetric method. Results expressed "as H_2S" if reported represent the maximum possible H_2S concentration based on the total sulfide concentration in the sample. The H_2S calculation converts Total Sulphide as (S2-) and reports it as Total Sulphide as (H_2S)
UV Absorbance and Transmittance by Spectrometry	E404 ALS Environmental - Vancouver	Water	APHA 5910 B (mod)	UV Absorbance is determined by first filtering a sample through a 0.45 micron filter, followed by UV absorbance measurement in a quartz cell at 254 nm. The analysis is carried out without pH adjustment.
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.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
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
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.
VH and F1 by Headspace GC-FID	E581.VH+F1 ALS Environmental - Vancouver	Water	BC MOE Lab Manual / CCME PHC in Soil - Tier 1 (mod)	Volatile Hydrocarbons (VH and F1) is analyzed by static headspace GC-FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law. Analytical methods for CCME Petroleum Hydrocarbons (PHCs) are validated to comply fully with the Reference Method for the Canada-Wide Standard for PHC. Unless qualified, all required quality control criteria of the CCME PHC method have been met, including response factor and linearity requirements.
BTEX by Headspace GC-MS	E611A ALS Environmental - Vancouver	Water	EPA 8260D (mod)	Volatile Organic Compounds (VOCs) are analyzed by static headspace GC-MS. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing VOCs to partition between the aqueous phase and the headspace in accordance with Henry's law.
Methane, Ethane, & Ethene by Headspace GC-FID	E614B ALS Environmental - Waterloo	Water	EPA REGION 1, NATATTEN.WPD, REV. 1	Volatile hydrocarbons are analyzed by static headspace GC/FID. Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler, causing the analyte(s) to partition between the aqueous phase and the headspace in accordance with Henry's law.
Dissolved Hardness (Calculated)	EC100 ALS Environmental - Vancouver	Water	APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in $CaCO_3$ 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 CaCO3), 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.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
F1-BTEX	EC580 ALS Environmental - Vancouver	Water	CCME PHC in Soil - Tier 1	F1-BTEX is calculated as follows: F1-BTEX = F1 (C6-C10) minus benzene, toluene, ethylbenzene and xylenes (BTEX).
VPH: VH-BTEX-Styrene	EC580A ALS Environmental - Vancouver	Water	BC MOE Lab Manual (VPH in Water and Solids) (mod)	Volatile Petroleum Hydrocarbons (VPH) is calculated as follows: VPHw = Volatile Hydrocarbons (VH C6-C10) minus benzene, toluene, ethylbenzene, xylenes (BTEX) and styrene.
Methane, Ethane, & Ethene by Headspace GC-FID	EC614B ALS Environmental - Waterloo	Water	Unit Conversion	Convert ppmV to ug/L

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Total Organic Carbon by Combustion	EP355 ALS Environmental - Calgary	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 ALS Environmental - Calgary	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
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.
VOCs Preparation for Headspace Analysis	EP581 ALS Environmental - Vancouver	Water	EPA 5021A (mod)	Samples are prepared in headspace vials and are heated and agitated on the headspace autosampler. An aliquot of the headspace is then injected into a GC-MS-FID.

QUALITY CONTROL REPORT

Work Order	: **FJ2402712**	Page	: 1 of 20
Client	: Tetra Tech Canada Inc.	Laboratory	: ALS Environmental - Fort St. John
Contact	: Andrea McMillan	Account Manager	: Brent Mack
Address	: 110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: ----	Telephone	: 778-370-3279
Project	: 704-ENW.GENV03704-02- Rose Prairie	Date Samples Received	: 09-Sep-2024 13:10
PO	: ----	Date Analysis Commenced	: 11-Sep-2024
C-O-C number	: ----	Issue Date	: 17-Sep-2024 16:02
Sampler	: Thomas Kolb		
Site	: ----		
Quote number	: VA24-EBAE100-013		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Daniel Shabestani	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
David Tremblett	VOC Section Supervisor	Waterloo Air Quality, Waterloo, Ontario
Elke Tabora	Lab Analyst	Calgary Inorganics, Calgary, Alberta
Janice Leung	Supervisor - Organics Instrumentation	Vancouver Organics, Burnaby, British Columbia
Kate Dimitrova	Supervisor - Inorganic	Vancouver Inorganics, Burnaby, British Columbia
Kevin Duarte	Supervisor - Metals ICP Instrumentation	Vancouver Metals, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Vancouver Inorganics, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Vancouver Metals, Burnaby, British Columbia
Leon Yang	Analyst	Vancouver Inorganics, Burnaby, British Columbia
Maya Urquhart	Lab Analyst	Vancouver Metals, Burnaby, British Columbia
Monica Ko	Lab Assistant	Vancouver Inorganics, Burnaby, British Columbia
Owen Cheng		Vancouver Metals, Burnaby, British Columbia
Walt Kippenhuck	Supervisor - Inorganic	Waterloo Inorganics, Waterloo, Ontario

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: 1644009)											
FJ2402707-027	Anonymous	Conductivity	----	E100	2.0	µS/cm	994	987	0.707%	10%	----
Physical Tests (QC Lot: 1644010)											
FJ2402707-027	Anonymous	pH	----	E108	0.10	pH units	8.51	8.51	0.00%	4%	----
Physical Tests (QC Lot: 1644011)											
FJ2402707-027	Anonymous	Alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	159	158	0.379%	200%	----
		Alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	10.8	10.8	0.00%	200%	----
		Alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0.00%	200%	----
		Alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	5.4	5.4	0	Diff <2x LOR	----
		Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	170	169	0.355%	20%	----
Physical Tests (QC Lot: 1644020)											
FJ2402712-001	LOCATION 3	Colour, true	----	E329	5.0	CU	<5.0	<5.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 1646854)											
FJ2402712-001	LOCATION 3	Turbidity	----	E121	0.10	NTU	316	311	1.60%	15%	----
Physical Tests (QC Lot: 1646857)											
FJ2402712-001	LOCATION 3	Absorbance, UV (@ 254nm)	----	E404	0.0050	AU/cm	0.0620	0.0630	1.60%	20%	----
Physical Tests (QC Lot: 1652612)											
FJ2402712-001	LOCATION 3	Solids, total dissolved [TDS]	----	E162	20	mg/L	1340	1340	0.0374%	20%	----
Anions and Nutrients (QC Lot: 1644012)											
FJ2402707-027	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	1.50	mg/L	402	402	0.0187%	20%	----
Anions and Nutrients (QC Lot: 1644013)											
FJ2402707-027	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0250	mg/L	0.713	0.714	0.138%	20%	----
Anions and Nutrients (QC Lot: 1644014)											
FJ2402707-027	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1644015)											
FJ2402707-027	Anonymous	Fluoride	16984-48-8	E235.F	0.140	mg/L	<0.142	<0.140	0.002	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1644016)											
FJ2402707-027	Anonymous	Chloride	16887-00-6	E235.Cl	2.50	mg/L	<2.50	<2.50	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1644017)											
FJ2402707-027	Anonymous	Bromide	24959-67-9	E235.Br-L	0.250	mg/L	<0.250	<0.250	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*
Cyanides (QC Lot: 1648080)											
VA24C3606-001	Anonymous	Cyanide, strong acid dissociable (Total)	----	E333	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 1652739)											
FJ2402699-001	Anonymous	Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	5.60	5.71	1.82%	20%	----
Organic / Inorganic Carbon (QC Lot: 1652740)											
FJ2402699-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	0.71	0.84	0.12	Diff <2x LOR	----
Total Sulfides (QC Lot: 1647389)											
FJ2402712-001	LOCATION 3	Sulfide, total (as S)	18496-25-8	E395-H	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Total Metals (QC Lot: 1647732)											
FJ2402701-001	Anonymous	Aluminum, total	7429-90-5	E420	0.0030	mg/L	<0.0030	<0.0030	0	Diff <2x LOR	----
		Antimony, total	7440-36-0	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Arsenic, total	7440-38-2	E420	0.00010	mg/L	0.00015	0.00015	0.0000004	Diff <2x LOR	----
		Barium, total	7440-39-3	E420	0.00010	mg/L	0.331	0.328	0.921%	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	0.101	0.098	0.003	Diff <2x LOR	----
		Cadmium, total	7440-43-9	E420	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		Calcium, total	7440-70-2	E420	0.050	mg/L	61.7	57.8	6.57%	20%	----
		Cesium, total	7440-46-2	E420	0.000010	mg/L	0.000020	0.000019	0.0000001	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	<0.00010	<0.00010	0	Diff <2x LOR	----
		Copper, total	7440-50-8	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Iron, total	7439-89-6	E420	0.010	mg/L	2.94	2.89	1.71%	20%	----
		Lead, total	7439-92-1	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Lithium, total	7439-93-2	E420	0.0010	mg/L	0.178	0.178	0.137%	20%	----
		Magnesium, total	7439-95-4	E420	0.0050	mg/L	29.2	30.1	3.09%	20%	----
		Manganese, total	7439-96-5	E420	0.00010	mg/L	0.229	0.232	1.29%	20%	----
		Molybdenum, total	7439-98-7	E420	0.000050	mg/L	0.000075	0.000071	0.000004	Diff <2x LOR	----
		Nickel, total	7440-02-0	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Phosphorus, total	7723-14-0	E420	0.050	mg/L	0.139	0.130	0.009	Diff <2x LOR	----
		Potassium, total	7440-09-7	E420	0.050	mg/L	2.35	2.38	1.34%	20%	----
		Rubidium, total	7440-17-7	E420	0.00020	mg/L	0.00270	0.00278	2.80%	20%	----
		Selenium, total	7782-49-2	E420	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Silicon, total	7440-21-3	E420	0.10	mg/L	3.88	3.90	0.468%	20%	----
		Silver, total	7440-22-4	E420	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	*Client sample ID*	*Analyte*	*CAS Number*	*Method*	*LOR*	*Unit*	*Original Result*	*Duplicate Result*	*RPD(%) or Difference*	*Duplicate Limits*	*Qualifier*
Total Metals (QC Lot: 1647732) - continued											
FJ2402701-001	Anonymous	Sodium, total	7440-23-5	E420	0.050	mg/L	250	255	1.73%	20%	----
		Strontium, total	7440-24-6	E420	0.00020	mg/L	0.582	0.571	1.90%	20%	----
		Sulfur, total	7704-34-9	E420	0.50	mg/L	1.61	1.77	0.16	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	----
		Titanium, total	7440-32-6	E420	0.00030	mg/L	<0.00030	0.00032	0.00002	Diff <2x LOR	----
		Tungsten, total	7440-33-7	E420	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Uranium, total	7440-61-1	E420	0.000010	mg/L	0.000093	0.000096	0.000003	Diff <2x LOR	----
		Vanadium, total	7440-62-2	E420	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Zinc, total	7440-66-6	E420	0.0030	mg/L	0.0623	0.0622	0.120%	20%	----
		Zirconium, total	7440-67-7	E420	0.00020	mg/L	0.00027	0.00027	0.0000003	Diff <2x LOR	----
Total Metals (QC Lot: 1654017)											
FJ2402701-001	Anonymous	Mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 1645007)											
FJ2402699-001	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.0010	mg/L	0.0013	0.0014	0.0001	Diff <2x LOR	----
		Antimony, dissolved	7440-36-0	E421	0.00010	mg/L	0.00015	0.00014	0.000005	Diff <2x LOR	----
		Arsenic, dissolved	7440-38-2	E421	0.00010	mg/L	0.00282	0.00279	0.971%	20%	----
		Barium, dissolved	7440-39-3	E421	0.00010	mg/L	1.92	1.88	2.34%	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	0.165	0.163	1.23%	20%	----
		Cadmium, dissolved	7440-43-9	E421	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.050	mg/L	89.8	87.5	2.53%	20%	----
		Cesium, dissolved	7440-46-2	E421	0.000010	mg/L	0.000028	0.000029	0.0000006	Diff <2x LOR	----
		Chromium, dissolved	7440-47-3	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Cobalt, dissolved	7440-48-4	E421	0.00010	mg/L	0.00153	0.00154	0.516%	20%	----
		Copper, dissolved	7440-50-8	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.010	mg/L	10.6	10.6	0.540%	20%	----
		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	0.0591	0.0565	4.51%	20%	----
		Magnesium, dissolved	7439-95-4	E421	0.0050	mg/L	23.0	23.2	0.938%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00010	mg/L	0.524	0.525	0.164%	20%	----

Sub-Matrix: **Water**

Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Laboratory Duplicate (DUP) Report						
					LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Dissolved Metals (QC Lot: 1645007) - continued											
FJ2402699-001	Anonymous	Molybdenum, dissolved	7439-98-7	E421	0.000050	mg/L	0.00122	0.00117	3.69%	20%	----
		Nickel, dissolved	7440-02-0	E421	0.00050	mg/L	0.00184	0.00186	0.00002	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	1.95	1.92	2.06%	20%	----
		Rubidium, dissolved	7440-17-7	E421	0.00020	mg/L	0.00352	0.00359	2.01%	20%	----
		Selenium, dissolved	7782-49-2	E421	0.000050	mg/L	<0.000050	<0.000050	0	Diff <2x LOR	----
		Silicon, dissolved	7440-21-3	E421	0.050	mg/L	3.63	3.68	1.36%	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	7.98	8.14	1.96%	20%	----
		Strontium, dissolved	7440-24-6	E421	0.00020	mg/L	0.279	0.277	0.540%	20%	----
		Sulfur, dissolved	7704-34-9	E421	0.50	mg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Tellurium, dissolved	13494-80-9	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Thallium, dissolved	7440-28-0	E421	0.000010	mg/L	<0.000010	<0.000010	0	Diff <2x LOR	----
		Thorium, dissolved	7440-29-1	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Tin, dissolved	7440-31-5	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Titanium, dissolved	7440-32-6	E421	0.00030	mg/L	<0.00030	<0.00030	0	Diff <2x LOR	----
		Tungsten, dissolved	7440-33-7	E421	0.00010	mg/L	<0.00010	<0.00010	0	Diff <2x LOR	----
		Uranium, dissolved	7440-61-1	E421	0.000010	mg/L	0.000131	0.000135	3.08%	20%	----
		Vanadium, dissolved	7440-62-2	E421	0.00050	mg/L	<0.00050	<0.00050	0	Diff <2x LOR	----
		Zinc, dissolved	7440-66-6	E421	0.0010	mg/L	0.0020	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: 1654684)											
FJ2402704-001	Anonymous	Mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Gases (QC Lot: 1649070)											
WT2426524-001	Anonymous	Methane	74-82-8	E614B	218	ppmv	3630	3530	2.78%	30%	----
Volatile Organic Compounds (QC Lot: 1648980)											
FJ2402701-001	Anonymous	Benzene	71-43-2	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Ethylbenzene	100-41-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Styrene	100-42-5	E611A	0.50	µg/L	<0.50	<0.50	0	Diff <2x LOR	----
		Toluene	108-88-3	E611A	0.50	µg/L	0.71	0.74	0.03	Diff <2x LOR	----
		Xylene, m+p-	179601-23-1	E611A	0.40	µg/L	<0.40	<0.40	0	Diff <2x LOR	----
		Xylene, o-	95-47-6	E611A	0.30	µg/L	<0.30	<0.30	0	Diff <2x LOR	----
Hydrocarbons (QC Lot: 1648981)											

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*
Hydrocarbons (QC Lot: 1648981) - continued											
FJ2402712-001	LOCATION 3	F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0.0%	30%	----
		VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	<100	0.0%	30%	----

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: 1644009)						
Conductivity	----	E100	1	µS/cm	1.2	----
Physical Tests (QCLot: 1644011)						
Alkalinity, bicarbonate (as CaCO3)	----	E290	1	mg/L	1.8	----
Alkalinity, carbonate (as CaCO3)	----	E290	1	mg/L	<1.0	----
Alkalinity, hydroxide (as CaCO3)	----	E290	1	mg/L	<1.0	----
Alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	<1.0	----
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	1.8	----
Physical Tests (QCLot: 1644020)						
Colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 1646854)						
Turbidity	----	E121	0.1	NTU	<0.10	----
Physical Tests (QCLot: 1646857)						
Absorbance, UV (@ 254nm)	----	E404	0.005	AU/cm	<0.0050	----
Physical Tests (QCLot: 1652612)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Anions and Nutrients (QCLot: 1644012)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Anions and Nutrients (QCLot: 1644013)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1644014)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 1644015)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1644016)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 1644017)						
Bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	----
Cyanides (QCLot: 1648080)						
Cyanide, strong acid dissociable (Total)	----	E333	0.002	mg/L	<0.0020	----
Organic / Inorganic Carbon (QCLot: 1652739)						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 1652740)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Organic / Inorganic Carbon (QCLot: 1652740) - continued						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Total Sulfides (QCLot: 1647389)						
Sulfide, total (as S)	18496-25-8	E395-H	0.01	mg/L	<0.010	----
Total Metals (QCLot: 1647732)						
Aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
Barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
Boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
Calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
Copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
Iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
Lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
Lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
Potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
Silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
Silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
Sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 1647732) - continued						
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	----
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: 1654017)						
Mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 1645007)						
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	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 1645007) - continued						
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	----
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: 1654684)						
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----
Dissolved Gases (QCLot: 1649070)						
Methane	74-82-8	E614B	20.77	ppmv	<20.8	----
Volatile Organic Compounds (QCLot: 1648980)						
Benzene	71-43-2	E611A	0.5	µg/L	<0.50	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	<0.50	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	<0.50	----
Styrene	100-42-5	E611A	0.5	µg/L	<0.50	----
Toluene	108-88-3	E611A	0.5	µg/L	<0.50	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	<0.40	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	<0.30	----
Hydrocarbons (QCLot: 1648981)						
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	<100	----

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	Target Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1644009)									
Conductivity	----	E100	1	µS/cm	147 µS/cm	96.7	90.0	110	----
Physical Tests (QCLot: 1644010)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 1644011)									
Alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	94.6	75.0	125	----
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	104	85.0	115	----
Physical Tests (QCLot: 1644020)									
Colour, true	----	E329	5	CU	100 CU	102	85.0	115	----
Physical Tests (QCLot: 1646854)									
Turbidity	----	E121	0.1	NTU	200 NTU	96.5	85.0	115	----
Physical Tests (QCLot: 1646857)									
Absorbance, UV (@ 254nm)	----	E404	0.005	AU/cm	0.693 AU/cm	94.1	85.0	115	----
Transmittance, UV (@ 254nm)	----	E404	----	% T/cm	20.3 % T/cm	110	85.0	115	----
Physical Tests (QCLot: 1652612)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	102	85.0	115	----
Anions and Nutrients (QCLot: 1644012)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 1644013)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	100.0	90.0	110	----
Anions and Nutrients (QCLot: 1644014)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 1644015)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	101	90.0	110	----
Anions and Nutrients (QCLot: 1644016)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	100	90.0	110	----
Anions and Nutrients (QCLot: 1644017)									
Bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	101	85.0	115	----
Cyanides (QCLot: 1648080)									
Cyanide, strong acid dissociable (Total)	----	E333	0.002	mg/L	0.25 mg/L	93.4	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Target Concentration	LCS	Low	High	Qualifier
Organic / Inorganic Carbon (QCLot: 1652739)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	94.5	80.0	120	----
Organic / Inorganic Carbon (QCLot: 1652740)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	92.7	80.0	120	----
Total Sulfides (QCLot: 1647389)									
Sulfide, total (as H2S)	7783-06-4	E395-H	----	mg/L	0.085 mg/L	105	80.0	120	----
Sulfide, total (as S)	18496-25-8	E395-H	0.01	mg/L	0.08 mg/L	105	80.0	120	----
Total Metals (QCLot: 1647732)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	107	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	100	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	110	80.0	120	----
Barium, total	7440-39-3	E420	0.0001	mg/L	0.25 mg/L	99.3	80.0	120	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	0.1 mg/L	99.7	80.0	120	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	108	80.0	120	----
Boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	93.2	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	103	80.0	120	----
Calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	98.3	80.0	120	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	97.2	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	106	80.0	120	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	0.25 mg/L	104	80.0	120	----
Copper, total	7440-50-8	E420	0.0005	mg/L	0.25 mg/L	104	80.0	120	----
Iron, total	7439-89-6	E420	0.01	mg/L	1 mg/L	98.0	80.0	120	----
Lead, total	7439-92-1	E420	0.00005	mg/L	0.5 mg/L	101	80.0	120	----
Lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	102	80.0	120	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	110	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	110	80.0	120	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	0.25 mg/L	101	80.0	120	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	0.5 mg/L	104	80.0	120	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	112	80.0	120	----
Potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	100	80.0	120	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	0.1 mg/L	106	80.0	120	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	1 mg/L	107	80.0	120	----
Silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	114	80.0	120	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	90.1	80.0	120	----
Sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	106	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Target Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 1647732) - continued									
Strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	102	80.0	120	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	101	80.0	120	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	105	80.0	120	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	104	80.0	120	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	103	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	98.8	80.0	120	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	106	80.0	120	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	105	80.0	120	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	108	80.0	120	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	106	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	112	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: 1654017)									
Mercury, total	7439-97-6	E508	0.000005	mg/L	0 mg/L	100	80.0	120	----
Dissolved Metals (QCLot: 1645007)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	99.5	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	95.3	80.0	120	----
Arsenic, dissolved	7440-38-2	E421	0.0001	mg/L	1 mg/L	100.0	80.0	120	----
Barium, dissolved	7440-39-3	E421	0.0001	mg/L	0.25 mg/L	95.8	80.0	120	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	99.0	80.0	120	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	96.7	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	107	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	93.7	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	100	80.0	120	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	94.8	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	95.6	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	94.5	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	93.1	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	97.2	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	95.9	80.0	120	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	95.6	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	98.3	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	96.3	80.0	120	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	95.4	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	95.1	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Target Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 1645007) - continued									
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	105	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	102	80.0	120	----
Rubidium, dissolved	7440-17-7	E421	0.0002	mg/L	0.1 mg/L	99.1	80.0	120	----
Selenium, dissolved	7782-49-2	E421	0.00005	mg/L	1 mg/L	93.1	80.0	120	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	96.3	80.0	120	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	88.1	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	99.5	80.0	120	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	97.2	80.0	120	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	89.1	80.0	120	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	93.5	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	97.3	80.0	120	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	95.7	80.0	120	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	90.9	80.0	120	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	93.9	80.0	120	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	94.1	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	98.3	80.0	120	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	97.0	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	91.2	80.0	120	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	93.4	80.0	120	----
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0 mg/L	99.4	80.0	120	----
Dissolved Gases (QCLot: 1649070)									
Methane	74-82-8	E614B	20.77	ppmv	432 ppmv	94.3	80.0	120	----
Volatile Organic Compounds (QCLot: 1648980)									
Benzene	71-43-2	E611A	0.5	µg/L	100 µg/L	111	70.0	130	----
Ethylbenzene	100-41-4	E611A	0.5	µg/L	100 µg/L	91.6	70.0	130	----
Methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	0.5	µg/L	100 µg/L	128	70.0	130	----
Styrene	100-42-5	E611A	0.5	µg/L	100 µg/L	96.2	70.0	130	----
Toluene	108-88-3	E611A	0.5	µg/L	100 µg/L	99.1	70.0	130	----
Xylene, m+p-	179601-23-1	E611A	0.4	µg/L	200 µg/L	101	70.0	130	----
Xylene, o-	95-47-6	E611A	0.3	µg/L	100 µg/L	94.6	70.0	130	----
Hydrocarbons (QCLot: 1648981)									
F1 (C6-C10)	----	E581.VH+F1	100	µg/L	6310 µg/L	83.3	70.0	130	----
VHw (C6-C10)	----	E581.VH+F1	100	µg/L	6310 µg/L	75.3	70.0	130	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier

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: 1644012)										
FJ2402707-028	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	ND mg/L	----	ND	75.0	125	----
Anions and Nutrients (QCLot: 1644013)										
FJ2402707-028	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	2.48 mg/L	2.5 mg/L	99.0	75.0	125	----
Anions and Nutrients (QCLot: 1644014)										
FJ2402707-028	Anonymous	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: 1644015)										
FJ2402707-028	Anonymous	Fluoride	16984-48-8	E235.F	0.997 mg/L	1 mg/L	99.7	75.0	125	----
Anions and Nutrients (QCLot: 1644016)										
FJ2402707-028	Anonymous	Chloride	16887-00-6	E235.Cl	99.9 mg/L	100 mg/L	99.9	75.0	125	----
Anions and Nutrients (QCLot: 1644017)										
FJ2402707-028	Anonymous	Bromide	24959-67-9	E235.Br-L	0.490 mg/L	0.5 mg/L	98.1	75.0	125	----
Cyanides (QCLot: 1648080)										
VA24C3606-001	Anonymous	Cyanide, strong acid dissociable (Total)	----	E333	0.207 mg/L	0.25 mg/L	82.8	75.0	125	----
Organic / Inorganic Carbon (QCLot: 1652739)										
FJ2402699-001	Anonymous	Carbon, total organic [TOC]	----	E355-L	ND mg/L	----	ND	70.0	130	----
Organic / Inorganic Carbon (QCLot: 1652740)										
FJ2402699-001	Anonymous	Carbon, dissolved organic [DOC]	----	E358-L	5.49 mg/L	5 mg/L	110	70.0	130	----
Total Sulfides (QCLot: 1647389)										
VA24C3586-001	Anonymous	Sulfide, total (as S)	18496-25-8	E395-H	0.998 mg/L	1 mg/L	99.8	75.0	125	----
Total Metals (QCLot: 1647732)										
FJ2402701-002	Anonymous	Aluminum, total	7429-90-5	E420	ND mg/L	----	ND	70.0	130	----
		Antimony, total	7440-36-0	E420	0.0183 mg/L	0.02 mg/L	91.6	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.0207 mg/L	0.02 mg/L	104	70.0	130	----
		Barium, total	7440-39-3	E420	ND mg/L	----	ND	70.0	130	----
		Beryllium, total	7440-41-7	E420	0.0372 mg/L	0.04 mg/L	93.1	70.0	130	----
		Bismuth, total	7440-69-9	E420	0.00912 mg/L	0.01 mg/L	91.2	70.0	130	----
		Boron, total	7440-42-8	E420	0.086 mg/L	0.1 mg/L	85.6	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.00384 mg/L	0.004 mg/L	95.9	70.0	130	----
		Calcium, total	7440-70-2	E420	ND mg/L	----	ND	70.0	130	----
		Cesium, total	7440-46-2	E420	0.00953 mg/L	0.01 mg/L	95.3	70.0	130	----
		Chromium, total	7440-47-3	E420	0.0387 mg/L	0.04 mg/L	96.8	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.0190 mg/L	0.02 mg/L	95.0	70.0	130	----
		Copper, total	7440-50-8	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: 1647732) - continued										
FJ2402701-002	Anonymous	Iron, total	7439-89-6	E420	1.93 mg/L	2 mg/L	96.5	70.0	130	----
		Lead, total	7439-92-1	E420	0.0180 mg/L	0.02 mg/L	90.0	70.0	130	----
		Lithium, total	7439-93-2	E420	0.0939 mg/L	0.1 mg/L	93.9	70.0	130	----
		Magnesium, total	7439-95-4	E420	ND mg/L	----	ND	70.0	130	----
		Manganese, total	7439-96-5	E420	0.0193 mg/L	0.02 mg/L	96.5	70.0	130	----
		Molybdenum, total	7439-98-7	E420	0.0192 mg/L	0.02 mg/L	95.9	70.0	130	----
		Nickel, total	7440-02-0	E420	0.0377 mg/L	0.04 mg/L	94.2	70.0	130	----
		Phosphorus, total	7723-14-0	E420	10.0 mg/L	10 mg/L	100	70.0	130	----
		Potassium, total	7440-09-7	E420	3.65 mg/L	4 mg/L	91.2	70.0	130	----
		Rubidium, total	7440-17-7	E420	0.0197 mg/L	0.02 mg/L	98.6	70.0	130	----
		Selenium, total	7782-49-2	E420	0.0415 mg/L	0.04 mg/L	104	70.0	130	----
		Silicon, total	7440-21-3	E420	9.65 mg/L	10 mg/L	96.5	70.0	130	----
		Silver, total	7440-22-4	E420	0.00369 mg/L	0.004 mg/L	92.2	70.0	130	----
		Sodium, total	7440-23-5	E420	1.90 mg/L	2 mg/L	95.0	70.0	130	----
		Strontium, total	7440-24-6	E420	ND mg/L	----	ND	70.0	130	----
		Sulfur, total	7704-34-9	E420	20.4 mg/L	20 mg/L	102	70.0	130	----
		Tellurium, total	13494-80-9	E420	0.0400 mg/L	0.04 mg/L	99.9	70.0	130	----
		Thallium, total	7440-28-0	E420	0.00369 mg/L	0.004 mg/L	92.3	70.0	130	----
		Thorium, total	7440-29-1	E420	0.0194 mg/L	0.02 mg/L	97.2	70.0	130	----
		Tin, total	7440-31-5	E420	0.0190 mg/L	0.02 mg/L	95.1	70.0	130	----
		Titanium, total	7440-32-6	E420	0.0400 mg/L	0.04 mg/L	99.9	70.0	130	----
		Tungsten, total	7440-33-7	E420	0.0193 mg/L	0.02 mg/L	96.7	70.0	130	----
		Uranium, total	7440-61-1	E420	0.00387 mg/L	0.004 mg/L	96.9	70.0	130	----
		Vanadium, total	7440-62-2	E420	0.0984 mg/L	0.1 mg/L	98.4	70.0	130	----
		Zinc, total	7440-66-6	E420	0.406 mg/L	0.4 mg/L	101	70.0	130	----
		Zirconium, total	7440-67-7	E420	0.0359 mg/L	0.04 mg/L	89.8	70.0	130	----
Total Metals (QCLot: 1654017)										
FJ2402701-002	Anonymous	Mercury, total	7439-97-6	E508	0.0000900 mg/L	0 mg/L	90.0	70.0	130	----
Dissolved Metals (QCLot: 1645007)										
FJ2402712-001	LOCATION 3	Aluminum, dissolved	7429-90-5	E421	0.189 mg/L	0.2 mg/L	94.4	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.0172 mg/L	0.02 mg/L	85.8	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.0199 mg/L	0.02 mg/L	99.4	70.0	130	----
		Barium, dissolved	7440-39-3	E421	ND mg/L	----	ND	70.0	130	----
		Beryllium, dissolved	7440-41-7	E421	0.0370 mg/L	0.04 mg/L	92.6	70.0	130	----
		Bismuth, dissolved	7440-69-9	E421	0.00768 mg/L	0.01 mg/L	76.8	70.0	130	----
		Boron, dissolved	7440-42-8	E421	ND mg/L	----	ND	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.00347 mg/L	0.004 mg/L	86.7	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	----	ND	70.0	130	----
		Cesium, dissolved	7440-46-2	E421	0.00860 mg/L	0.01 mg/L	86.0	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.0360 mg/L	0.04 mg/L	90.1	70.0	130	----
		Cobalt, dissolved	7440-48-4	E421	0.0168 mg/L	0.02 mg/L	84.0	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.0161 mg/L	0.02 mg/L	80.4	70.0	130	----
		Iron, dissolved	7439-89-6	E421	1.68 mg/L	2 mg/L	84.0	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
Dissolved Metals (QCLot: 1645007) - continued										
FJ2402712-001	LOCATION 3	Lead, dissolved	7439-92-1	E421	0.0158 mg/L	0.02 mg/L	78.8	70.0	130	----
		Lithium, dissolved	7439-93-2	E421	0.0908 mg/L	0.1 mg/L	90.8	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	----	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	ND mg/L	----	ND	70.0	130	----
		Molybdenum, dissolved	7439-98-7	E421	0.0183 mg/L	0.02 mg/L	91.4	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.0328 mg/L	0.04 mg/L	81.9	70.0	130	----
		Phosphorus, dissolved	7723-14-0	E421	10.6 mg/L	10 mg/L	106	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	ND mg/L	----	ND	70.0	130	----
		Rubidium, dissolved	7440-17-7	E421	0.0176 mg/L	0.02 mg/L	88.3	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.0373 mg/L	0.04 mg/L	93.3	70.0	130	----
		Silicon, dissolved	7440-21-3	E421	8.40 mg/L	10 mg/L	84.0	70.0	130	----
		Silver, dissolved	7440-22-4	E421	0.00249 mg/L	0.004 mg/L	62.2	70.0	130	MES
		Sodium, dissolved	7440-23-5	E421	ND mg/L	----	ND	70.0	130	----
		Strontium, dissolved	7440-24-6	E421	ND mg/L	----	ND	70.0	130	----
		Sulfur, dissolved	7704-34-9	E421	ND mg/L	----	ND	70.0	130	----
		Tellurium, dissolved	13494-80-9	E421	0.0362 mg/L	0.04 mg/L	90.4	70.0	130	----
		Thallium, dissolved	7440-28-0	E421	0.00317 mg/L	0.004 mg/L	79.3	70.0	130	----
		Thorium, dissolved	7440-29-1	E421	0.0182 mg/L	0.02 mg/L	90.9	70.0	130	----
		Tin, dissolved	7440-31-5	E421	0.0167 mg/L	0.02 mg/L	83.6	70.0	130	----
		Titanium, dissolved	7440-32-6	E421	0.0377 mg/L	0.04 mg/L	94.2	70.0	130	----
		Tungsten, dissolved	7440-33-7	E421	0.0172 mg/L	0.02 mg/L	85.8	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	0.00343 mg/L	0.004 mg/L	85.7	70.0	130	----
		Vanadium, dissolved	7440-62-2	E421	0.0938 mg/L	0.1 mg/L	93.8	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	0.327 mg/L	0.4 mg/L	81.8	70.0	130	----
		Zirconium, dissolved	7440-67-7	E421	0.0389 mg/L	0.04 mg/L	97.2	70.0	130	----
Dissolved Metals (QCLot: 1654684)										
FJ2402704-002	Anonymous	Mercury, dissolved	7439-97-6	E509	0.0000987 mg/L	0 mg/L	98.7	70.0	130	----
Volatile Organic Compounds (QCLot: 1648980)										
FJ2402701-002	Anonymous	Benzene	71-43-2	E611A	112 µg/L	100 µg/L	112	60.0	140	----
		Ethylbenzene	100-41-4	E611A	92.5 µg/L	100 µg/L	92.5	60.0	140	----
		Methyl-tert-butyl ether [MTBE]	1634-04-4	E611A	133 µg/L	100 µg/L	133	60.0	140	----
		Styrene	100-42-5	E611A	96.6 µg/L	100 µg/L	96.6	60.0	140	----
		Toluene	108-88-3	E611A	99.7 µg/L	100 µg/L	99.7	60.0	140	----
		Xylene, m+p-	179601-23-1	E611A	209 µg/L	200 µg/L	104	60.0	140	----
		Xylene, o-	95-47-6	E611A	96.8 µg/L	100 µg/L	96.8	60.0	140	----
Hydrocarbons (QCLot: 1648981)										
VA24C3243-001	Anonymous	F1 (C6-C10)	----	E581.VH+F1	4910 µg/L	6310 µg/L	77.8	60.0	140	----
		VHw (C6-C10)	----	E581.VH+F1	4440 µg/L	6310 µg/L	70.4	60.0	140	----

Qualifiers

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

Chain of Custody (COC) / Analytical Request Form

www.alsglobal.com

Canada Toll Free: 1 800 668 9878

COC Number: 21 -

Page 1 of 1

Environmental Division
Fort St. John
Work Order Reference
FJ2402712

Telephone : +1 250 261 5617

ESDAT FORMAT

Report To	Contact and company name below will appear on the final report
Company:	Tetra Tech
Contact:	Andrea McMillan
Phone:	403-203-3355
	Company address below will appear on the final report
Street:	140 Quarry Park Blvd
City/Province:	Calgary, Alberta
Postal Code:	T2C 3G3
Invoice To	Same as Report To ☑ YES ☐ NO
	Copy of Invoice with Report ☐ YES ☐ NO
Company:	
Contact:	

Reports / Recipients	
Select Report Format:	☑ PDF ☑ EXCEL ☑ EDD (DIGITAL)
Merge QC/QCI Reports with COA	☐ YES ☐ NO ☐ N/A
☐ Compare Results to Criteria on Report - provide details below if box checked	
Select Distribution:	☑ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	Andrea.Mcmillan@tetratech.com
Email 2	EBA.labdata@tetratech.com
Email 3	Aziz.Shaikh@tetratech.com
Invoice Recipients	
Select Invoice Distribution:	☐ EMAIL ☐ MAIL ☐ FAX
Email 1 or Fax	
Email 2	

Turnaround Time (TAT) Requested
☑ Routine [R] if received by 3pm M-F - no surcharges apply
☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge min
☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge mi
☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge mi
☒ 1 day [E] if received by 3pm M-F - 100% rush surcharge mi
☐ Same day [E2] if received by 10am M-S - 200% rush surcha
Additional fees may apply to rush requests on weeke
Date and Time Required for all E&P TATs: 9-SEP-24 9:00 AM
For all tests with rush TATs requested, please contact your AM to confirm availability.

Project Information		Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	VA24-EBAGIDD-013	AFE/Cost Center:	PO#:
Job #:	704-ENW.GENV03704-02 / ROSE PRAIRIE	Major/Minor Code:	Routing Code:
PO / AFE:		Requisitioner:	
LSD:		Location:	
ALS Lab Work Order # (ALS use only):		ALS Contact:	Sampler:

Analysis Request

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

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS	Dissolved Gas (CH4, H2S) F/P	Routine	Anions	Physical Test	H2S	Dissolved Metals	Total Metals + Hg F/P	Cyanide	DOC F/P	Total Organic Carbon	BTEX - F1, F2	VPH	VOC	LEPH/HEPH/PAH	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	LOCATION 3	09-SEP-24	11:07	WATER	11	X	X	X	X	X	X	X	X	X	X	X						

FJAE Shipping & Receiving
__ Call Out __ Expedite
__ Priority
1 # of Coolers ✓ Air
__ # of Carboys __ Ground

Drinking Water (DW) Samples[1] (client use)	Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)
Are samples taken from a Regulated DW System? ☐ YES ☐ NO	
Are samples for human consumption/ use? ☐ YES ☐ NO	Confirm Analysis with Andrea McMillan / ESDAT FORMAT

SAMPLE RECEIPT DETAILS (ALS use only)

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

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

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

INITIAL COOLER TEMPERATURES °C	FINAL COOLER TEMPERATURES °C
16°	9

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by: Thomas Kang	Date: 9/9/24	Time: 1100	Re [redacted]	Date: 09/09/24	Time: 1710	R [redacted]	Date: Sept 10	Time: 9:55 am

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

AUG 2021 FRONT

Failure to complete all portions of this form may delay analysis. Please fill in this form LEGIBLY. By the use [redacted] s 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.

CERTIFICATE OF ANALYSIS

Work Order	: **FJ2402713**	Page	: 1 of 4
Client	: **Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Fort St. John
Contact	: Andrea McMillan	Account Manager	: Brent Mack
Address	: 110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 11007 Alaska Road Fort St. John BC Canada V1J 6P3
Telephone	: ----	Telephone	: 778-370-3279
Project	: 704.ENW.GEN03704-02	Date Samples Received	: 09-Sep-2024 13:10
PO	: ----	Date Analysis Commenced	: 13-Sep-2024
C-O-C number	: ----	Issue Date	: 18-Sep-2024 08:34
Sampler	: Thomas Kolb		
Site	: ----		
Quote number	: VA24-EBAE100-013		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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*
David Tremblett	VOC Section Supervisor	Air Quality, Waterloo, Ontario

General Comments

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

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

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

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

Key : CAS Number: Chemical Abstracts Services number is a unique identifier assigned to discrete substances

LOR: Limit of Reporting (detection limit).

Unit	*Description*
-	no units
%	percent
µg/m³	micrograms per cubic metre
Inches Hg	inches of mercury
ppbv	parts per billion (volume/volume)

<: 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.

Qualifiers

Qualifier	*Description*
HTA	*Analytical holding time was exceeded.*

Analytical Results

Sub-Matrix: **Air**
(Matrix: **Air**)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID: LOCATION 3	----	----	----	----
					Client sampling date / time: 09-Sep-2024 11:16	----	----	----	----
					FJ2402713-001	--------	--------	--------	--------
					Result	----	----	----	----
Field Tests									
ID, batch proof	----	EF001/WT	-	-	240702.221	----	----	----	----
ID, canister	----	EF001/WT	-	-	01400-0101	----	----	----	----
ID, regulator	----	EF001/WT	-	-	G245	----	----	----	----
Pressure on receipt	----	EF001/WT	0.10	Inches Hg	-2.05	----	----	----	----
Sulfur Compounds									
Carbon disulfide	75-15-0	EC630/WT	6.2	µg/m³	<6.2	----	----	----	----
Carbon disulfide	75-15-0	E630/WT	2.0	ppbv	<2.0 HTA	----	----	----	----
Carbonyl sulfide	463-58-1	EC630/WT	10	µg/m³	24	----	----	----	----
Carbonyl sulfide	463-58-1	E630/WT	4.0	ppbv	9.6 HTA	----	----	----	----
Diethyl disulfide	110-81-6	EC630/WT	10	µg/m³	<10	----	----	----	----
Diethyl disulfide	110-81-6	E630/WT	2.0	ppbv	<2.0 HTA	----	----	----	----
Diethyl sulfide	352-93-2	EC630/WT	15	µg/m³	<15	----	----	----	----
Diethyl sulfide	352-93-2	E630/WT	4.0	ppbv	<4.0 HTA	----	----	----	----
Dimethyl disulfide	624-92-0	EC630/WT	7.7	µg/m³	<7.7	----	----	----	----
Dimethyl disulfide	624-92-0	E630/WT	2.0	ppbv	<2.0 HTA	----	----	----	----
Dimethyl sulfide	75-18-3	EC630/WT	10	µg/m³	<10	----	----	----	----
Dimethyl sulfide	75-18-3	E630/WT	4.0	ppbv	<4.0 HTA	----	----	----	----
Dimethylthiophene, 2,5-	638-02-8	EC630/WT	18	µg/m³	<18	----	----	----	----
Dimethylthiophene, 2,5-	638-02-8	E630/WT	4.0	ppbv	<4.0 HTA	----	----	----	----
Ethyl mercaptan	75-08-1	EC630/WT	10	µg/m³	<10	----	----	----	----
Ethyl mercaptan	75-08-1	E630/WT	4.0	ppbv	<4.0 HTA	----	----	----	----
Ethyl methyl sulfide	624-89-5	EC630/WT	12	µg/m³	<12	----	----	----	----
Ethyl methyl sulfide	624-89-5	E630/WT	4.0	ppbv	<4.0 HTA	----	----	----	----
Ethylthiophene, 2-	872-55-9	EC630/WT	18	µg/m³	<18	----	----	----	----
Ethylthiophene, 2-	872-55-9	E630/WT	4.0	ppbv	<4.0 HTA	----	----	----	----
Hydrogen sulfide	7783-06-4	EC630/WT	5.6	µg/m³	<5.6	----	----	----	----
Hydrogen sulfide	7783-06-4	E630/WT	4.0	ppbv	<4.0 HTA	----	----	----	----
Isobutyl mercaptan	513-44-0	EC630/WT	15	µg/m³	<15	----	----	----	----
Isobutyl mercaptan	513-44-0	E630/WT	4.0	ppbv	<4.0 HTA	----	----	----	----

Analytical Results

Sub-Matrix: Air (Matrix: Air)					Client sample ID	LOCATION 3	----	----	----	----
					Client sampling date / time	09-Sep-2024 11:16	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	FJ2402713-001	--------	--------	--------	--------	
					Result	----	----	----	----	
Sulfur Compounds										
Isopropyl mercaptan	75-33-2	EC630/WT	12	µg/m³	<12	----	----	----	----	
Isopropyl mercaptan	75-33-2	E630/WT	4.0	ppbv	<4.0 HTA	----	----	----	----	
Methyl mercaptan	74-93-1	EC630/WT	7.9	µg/m³	<7.9	----	----	----	----	
Methyl mercaptan	74-93-1	E630/WT	4.0	ppbv	<4.0 HTA	----	----	----	----	
Methylthiophene, 2-	554-14-3	EC630/WT	16	µg/m³	<16	----	----	----	----	
Methylthiophene, 2-	554-14-3	E630/WT	4.0	ppbv	<4.0 HTA	----	----	----	----	
Methylthiophene, 3-	616-44-4	EC630/WT	16	µg/m³	<16	----	----	----	----	
Methylthiophene, 3-	616-44-4	E630/WT	4.0	ppbv	<4.0 HTA	----	----	----	----	
n-Butyl mercaptan	109-79-5	EC630/WT	15	µg/m³	<15	----	----	----	----	
n-Butyl mercaptan	109-79-5	E630/WT	4.0	ppbv	<4.0 HTA	----	----	----	----	
Propyl mercaptan	107-03-9	EC630/WT	12	µg/m³	<12	----	----	----	----	
Propyl mercaptan	107-03-9	E630/WT	4.0	ppbv	<4.0 HTA	----	----	----	----	
sec-butyl mercaptan + thiophene	----	EC630/WT	14	µg/m³	<21	----	----	----	----	
sec-butyl mercaptan + thiophene	----	E630/WT	6.0	ppbv	<6.0 HTA	----	----	----	----	
t-Butyl mercaptan	75-66-1	EC630/WT	15	µg/m³	<15	----	----	----	----	
t-Butyl mercaptan	75-66-1	E630/WT	4.0	ppbv	<4.0 HTA	----	----	----	----	
Tetrahydrothiophene	110-01-0	EC630/WT	14	µg/m³	<14	----	----	----	----	
Tetrahydrothiophene	110-01-0	E630/WT	4.0	ppbv	<4.0 HTA	----	----	----	----	
Sulfur, total reduced (as H2S), 10 compounds	----	EC630/WT	16	µg/m³	<16	----	----	----	----	
Sulfur, total reduced (as H2S), 22 compounds	----	EC630/WT	25	µg/m³	<25	----	----	----	----	
Sulfur, total reduced (as H2S), NPRI 6	----	EC630/WT	12	µg/m³	13	----	----	----	----	
Sulfur, total reduced (as H2S), Ontario 4	----	EC630/WT	11	µg/m³	<11	----	----	----	----	
Permanent Gases										
Methane	74-82-8	E629B-H/WT	0.050	%	<0.050	----	----	----	----	

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

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

ALS Canada Ltd.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2402713**	Page	: 1 of 5
Client	: **Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Fort St. John
Contact	: Andrea McMillan	Account Manager	: Brent Mack
Address	: 110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: ----	Telephone	: 778-370-3279
Project	: 704.ENW.GEN03704-02	Date Samples Received	: 09-Sep-2024 13:10
PO	: ----	Issue Date	: 18-Sep-2024 08:34
C-O-C number	: ----		
Sampler	: Thomas Kolb		
Site	: ----		
Quote number	: VA24-EBAE100-013		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

- No Quality Control Sample Frequency Outliers occur.

Analysis Holding Time Compliance

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

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

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

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

Matrix: **Air**

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*
Field Tests : Air Canister Information										
Canister LOCATION 3	EF001	09-Sep-2024	----	----	----		13-Sep-2024	----	4 days	
Permanent Gases : Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)										
Canister LOCATION 3	E629B-H	09-Sep-2024	----	----	----		13-Sep-2024	30 days	4 days	✓
Sulfur Compounds : Reduced Sulfur Compounds in Passivated Canisters by GC-SCD (All List) (ppbV)										
Canister LOCATION 3	E630	09-Sep-2024	----	----	----		17-Sep-2024	7 days	8 days	× EHT

Legend & Qualifier Definitions

EHT: Exceeded ALS recommended hold time prior to analysis.

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: **Air**

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)							
Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)	E629B-H	1649291	1	1	100.0	5.0	✓
Reduced Sulfur Compounds in Passivated Canisters by GC-SCD (All List) (ppbV)	E630	1649183	1	1	100.0	5.0	✓
Laboratory Control Samples (LCS)							
Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)	E629B-H	1649291	1	1	100.0	5.0	✓
Reduced Sulfur Compounds in Passivated Canisters by GC-SCD (All List) (ppbV)	E630	1649183	1	1	100.0	5.0	✓
Method Blanks (MB)							
Air Canister Information	EF001	1649126	1	6	16.6	5.0	✓
Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)	E629B-H	1649291	1	1	100.0	5.0	✓
Reduced Sulfur Compounds in Passivated Canisters by GC-SCD (All List) (ppbV)	E630	1649183	1	1	100.0	5.0	✓

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)	E629B-H ALS Environmental - Waterloo	Air	EPA Method 3C & ASTM D1946	This analysis is performed using procedures adapted from EPA Method 3C & ASTM D1946. Air samples are collected into cleaned evacuated canisters. A volume of air is removed from the canister and injected by means of a gas-sampling/backflush valve onto a series of packed GC columns and measured using a thermal conductivity detector (TCD). Oxygen is not separated from Argon. Canister samples will be retained for 7 calendar days after final report. If you require a longer canister storage time, please contact your account manager.
Reduced Sulfur Compounds in Passivated Canisters by GC-SCD (All List) (ppbV)	E630 ALS Environmental - Waterloo	Air	ASTM D5504	This analysis is performed using procedures adapted from ASTM D5504. Air samples are collected into cleaned evacuated silica-coated canisters. By means of a loop system, a volume of air is transferred from the canister and cryofocused before determining the sulfur compounds by GC-SCD. Silica coated passivated canisters may allow for reliable sample analysis after 24 hours. In such cases, analysis is recommended within 7 days of collection. Canister samples will be retained for 7 calendar days after final report. If you require a longer canister storage time, please contact your Project Manager.
Reduced Sulfur Compounds in Passivated Canisters by GC-SCD (All List) (ug/m3)	EC630 ALS Environmental - Waterloo	Air	ASTM D5504	convert ppbv to ug/m3
Air Canister Information	EF001 ALS Environmental - Waterloo	Air	In-house	Air canister information provided by client and recorded on ALS report may affect the validity of results.

QUALITY CONTROL REPORT

Work Order	: **FJ2402713**	Page	: 1 of 5
Client	: Tetra Tech Canada Inc.	Laboratory	: ALS Environmental - Fort St. John
Contact	: Andrea McMillan	Account Manager	: Brent Mack
Address	: 110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: ----	Telephone	: 778-370-3279
Project	: 704.ENW.GEN03704-02	Date Samples Received	: 09-Sep-2024 13:10
PO	: ----	Date Analysis Commenced	: 13-Sep-2024
C-O-C number	: ----	Issue Date	: 18-Sep-2024 08:34
Sampler	: Thomas Kolb		
Site	: ----		
Quote number	: VA24-EBAE100-013		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- 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*
David Tremblett	VOC Section Supervisor	Waterloo Air Quality, Waterloo, Ontario

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: **Air**

					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
Sulfur Compounds (QC Lot: 1649183)											
FJ2402713-001	LOCATION 3	Carbon disulfide	75-15-0	E630	2.0	ppbv	<2.0	<2.0	0	Diff <2x LOR	----
		Carbonyl sulfide	463-58-1	E630	4.0	ppbv	9.6	9.4	0.2	Diff <2x LOR	----
		Diethyl disulfide	110-81-6	E630	2.0	ppbv	<2.0	<2.0	0	Diff <2x LOR	----
		Diethyl sulfide	352-93-2	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Dimethyl disulfide	624-92-0	E630	2.0	ppbv	<2.0	<2.0	0	Diff <2x LOR	----
		Dimethyl sulfide	75-18-3	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Dimethylthiophene, 2,5-	638-02-8	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Ethyl mercaptan	75-08-1	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Ethyl methyl sulfide	624-89-5	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Ethylthiophene, 2-	872-55-9	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Hydrogen sulfide	7783-06-4	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Isobutyl mercaptan	513-44-0	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Isopropyl mercaptan	75-33-2	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Methyl mercaptan	74-93-1	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Methylthiophene, 2-	554-14-3	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Methylthiophene, 3-	616-44-4	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		n-Butyl mercaptan	109-79-5	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Propyl mercaptan	107-03-9	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		sec-butyl mercaptan + thiophene	----	E630	6.0	ppbv	<6.0	<6.0	0	Diff <2x LOR	----
		t-Butyl mercaptan	75-66-1	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Tetrahydrothiophene	110-01-0	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
Permanent Gases (QC Lot: 1649291)											
FJ2402713-001	LOCATION 3	Methane	74-82-8	E629B-H	0.050	%	<0.050	<0.050	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: **Air**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Field Tests (QCLot: 1649126)						
Pressure on receipt	----	EF001	0.1	Inches Hg	-30.0	----
Sulfur Compounds (QCLot: 1649183)						
Carbon disulfide	75-15-0	E630	2	ppbv	<2.0	----
Carbonyl sulfide	463-58-1	E630	4	ppbv	<4.0	----
Diethyl disulfide	110-81-6	E630	2	ppbv	<2.0	----
Diethyl sulfide	352-93-2	E630	4	ppbv	<4.0	----
Dimethyl disulfide	624-92-0	E630	2	ppbv	<2.0	----
Dimethyl sulfide	75-18-3	E630	4	ppbv	<4.0	----
Dimethylthiophene, 2,5-	638-02-8	E630	4	ppbv	<4.0	----
Ethyl mercaptan	75-08-1	E630	4	ppbv	<4.0	----
Ethyl methyl sulfide	624-89-5	E630	4	ppbv	<4.0	----
Ethylthiophene, 2-	872-55-9	E630	4	ppbv	<4.0	----
Hydrogen sulfide	7783-06-4	E630	4	ppbv	<4.0	----
Isobutyl mercaptan	513-44-0	E630	4	ppbv	<4.0	----
Isopropyl mercaptan	75-33-2	E630	4	ppbv	<4.0	----
Methyl mercaptan	74-93-1	E630	4	ppbv	<4.0	----
Methylthiophene, 2-	554-14-3	E630	4	ppbv	<4.0	----
Methylthiophene, 3-	616-44-4	E630	4	ppbv	<4.0	----
n-Butyl mercaptan	109-79-5	E630	4	ppbv	<4.0	----
Propyl mercaptan	107-03-9	E630	4	ppbv	<4.0	----
sec-butyl mercaptan + thiophene	----	E630	6	ppbv	<6.0	----
t-Butyl mercaptan	75-66-1	E630	4	ppbv	<4.0	----
Tetrahydrothiophene	110-01-0	E630	4	ppbv	<4.0	----
Permanent Gases (QCLot: 1649291)						
Methane	74-82-8	E629B-H	0.05	%	<0.050	----

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: **Air**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Sulfur Compounds (QCLot: 1649183)									
Carbonyl sulfide	463-58-1	E630	4	ppbv	104 ppbv	98.6	60.0	140	----
Hydrogen sulfide	7783-06-4	E630	4	ppbv	112 ppbv	97.1	60.0	140	----
Methyl mercaptan	74-93-1	E630	4	ppbv	101 ppbv	102	60.0	140	----
Permanent Gases (QCLot: 1649291)									
Methane	74-82-8	E629B-H	0.05	%	15 %	93.4	70.0	130	----

Rush Samples

FJAE Shipping & Receiving
__ Call Out __ Expedite
__ Priority
1 # of Coolers __ Air
__ # of Carboys __ Ground

60 NORTHLAND ROAD, UNIT 1
WATERLOO, ON N2V 2B8
Phone: (519) 886-6910
Fax: (519) 886-9047
Toll Free: 1-800-668-9878

ALS Environmental

AIR QUALITY CHAIN OF CUSTODY FORM - Canister/Tube/Gas Bag

Note: All TAT Quoted is in business days which exclude statutory holidays and weekends. TAT of samples received past 3:00 pm or Saturday / Sunday begin the next day.

DATE REQUIRED: 9/13/24

SERVICE REQUESTED
- 10 day (regular) ☐
- Rush 5 day (50%) ☐
- Rush 3 day (100%) ☑
- Rush 2 day (200%) ☐
- Rush 1 day (300%) - Enquire ☐

All rush work requires lab approval before sample submission

COMPANY NAME	TETRA TECH
OFFICE	140 QUARRY PARK BLVD CALGARY, ALBERTA T2C 3G3
PROJECT MANAGER	ANDREA MCMILLAN
PROJECT #	704-ENW. GENN03704-02
PHONE	403 203 3355
FAX	
ACCOUNT #	TETRA TECH
QUOTATION #	VA24-ESAG100-013
PO #	

REGULATION:
CRITERIA:
OTHER INFORMATION:

REPORT FORMAT/DISTRIBUTION
EMAIL ✓ FAX ___ BOTH ___
SELECT: PDF ✓ DIGITAL ✓ BOTH ✓
EMAIL 1 ANDREA.MCMILLAN@TETRATECH.COM
EMAIL 2 AZIZ.SHAIKH@TETRATECH.COM

SUBMISSION #:
ENTERED BY:
DATE/TIME ENTERED:
BIN #:

SAMPLING INFORMATION

Sample Date/Time		Canister or Tube ID# (e.g. 060000-XXXX or G0XXXXXXSVI)	Regulator Serial # CS1200-XXXX or GXX	Matrix Type	SAMPLE DESCRIPTION TO APPEAR ON REPORT	TUBE AIR VOLUME L or m³ ☐	HZS	CH4	STARTING PRESSURE - Pre-Sampling ("Hg)	ENDING PRESSURE - Post Sampling ("Hg)	COLLECTION TIME (min) SUM	Field Conditions (Rain/Wind/Dust/Odour) Field PID Reading	LAB ID
Date (dd-mmm-yy)	Time (24hr) (hh:mm)												
04-SEP-24	11:16	01400_0101	4245	AA	LOCATION 3	1.4	X	X	30	8	4	RAIN, 0ppm	

Environmental Division
Fort St. John
Work Order Reference
FJ2402713
Telephone : +1 250 261 5517

SPECIAL INSTRUCTIONS/COMMENTS

This Chain of Custody Form is only to be used for Air Quality Samples

Matrix Type: Soil Gas Vapour = SG; Indoor Air = IA; Ambient Air = AA; Industrial Hygiene = IH

SAMPLE CONDITION AS RECEIVED
FROZEN ☐ COLD ☐ COOLING INITIATED ☐ AMBIENT ☐
MEAN TEMP

SAMPLED BY: THOMAS KOLB	DATE & TIME 9/9/24 1100	RECEIVED BY: [redacted]	DATE & TIME 09/09/24	OBSERVATIONS Yes ☐ No ☐ If yes add SIF	INIT
RELINQUISHED BY: THOMAS KOLB	DATE & TIME 9/9/24 1100	RECEIVED AT LAB BY:	DATE & TIME		

Notes

1. Quote number must be provided to ensure proper pricing

2. TAT may vary dependent on complexity of analysis and lab workload at time of submission. Please contact the lab to confirm TATs.

3. Any known or suspected hazards relating to a sample must be noted on the chain of custody in comments section.

REV6-2015

1400

ALS Environmental
60 Northland Drive, Unit 1
Waterloo, ON
N2V 2B8

AIR SAMPLING MEDIA REQUEST FORM

COMPLETE Blue sections. Grey sections are for INTERNAL USE ONLY
Form MUST be reviewed & initialled by an ALS Account Manager prior to submission to NAWTR AIRMEDIA REQUEST (nawtr.airmediarequest@alsglobal.com)

SHIPPING INFO: pls ship PUROLATOR EXPRESS TODAY 21AUG for delivery 23AUG to ALS FSJ

CLIENT:	TetraTech
CLIENT CONTACT:	Andrea McMillan
CLIENT PROJECT/PO:	Gas and GW sampling
QUOTE #: (mandatory)	TetraTech MSA
DELIVERY TO:	ALS Fort St John BC, 11607 Alaska Road, Fort St John , BC, V1J 6P3 for client P/U
TELEPHONE NUMBER:	587-830-1121
SHIP TO (include email):	andrea.mcmillan@tetratech.com

ORDER TAKEN BY:	Wendy Sears
ORDER DATE:	21-Aug-24
AM REVIEWER:	DSTASTNY
CLIENT EXPECT DATE:	23-Aug-24
ORDER FILLED BY:	YB
PEER REVIEWER:	
DATE COMPLETED:	23-Aug-24

Shipping Method: (Select one)
- [x] o Regular (ALS will cover shipping cost)
- [ ] o RUSH(Client will be billed for shipping costs, please confirm with Account Manager)
- [ ] o External Courier
- [ ] o Pickup at ALS
- [ ] • Location:
- [ ] o ALS Drivers

Shipping Company:
- ( ) o FedEx
- (•) o Purolator
- ( ) o DHL
- ( ) o UPS
- ( ) o Other
- ( ) o N/A

Tracking Number:

Completion of all Sections is Mandatory

1. What type of air is being sampled? ***Check all appropriate types in the Additional Information Box below***
2. Please provide a list of compounds and reporting limits that are required. ***Include regulation & target list (attach to email)***
3. What is your planned canister sampling time? ***Options listed under Regulator Times***
4. Trip blanks will be shipped **pre-filled** unless specifically requested below.

Note: If analysis required is DIFFERENT than what is LISTED on this form, email nawtr.airmediarequest@alsglobal.com ASAP to confirm the media was adequately proofed.

Canister Size/Tube	Regulator Times	Regulator Quantity	Parameters/ Product Codes	Canister/Tube Identification #	Initial Pressure/Flow (mmHg/mL per min)	Controller Identification #
6L Canister	24 hr					
	12 hr					
	8 hr					
	4 hr					
	1 hr					
	0.5 hr					
Number of Canisters	Trip Blank					
1.4L Canister	60 mins		Methane, S629M, Full Sulfur Scan S630	01400-0101	-28.7	G245
	20 mins					
	10 mins					
	4 mins	1				
	No Restrictor					
Number of Canisters 1	Trip Blank					
Bottle Vacs	40 mins					
	14 mins					
	7 mins					
	3 mins					
	No Restrictor					
Number of Canisters	Trip Blank					
Passive CarboPak X Tubes						
Diffusive Caps						
Active SVI Tubes						
Calibration Tube for SVI (yes/no)						

Other Sampling Supplies	Quantity	ID #
Pressure Gauge		
Caplok Tool		
Canister Stands		
Valve Adaptor for Soil Vapour		

Chargeable Supplies		Quantity
Duplicate Sampler - $45 canister		
Valve Adaptor for Soil Vapour $5		
Teflon Tubing - $3 per foot	-Total length (ft)	
	-Length per section (ft)	
Nut & Ferrule Sets - $8 per set		
Tedlar Bags (contact the lab before SUBMITTING)	-$28 unpurged	
	-$45 purged	
Siloxane Kit - $100 each (Kit: $50, TD tube prep/rental: $50)		
Rush Order Prep Charge (<48 hour notice, not including shipping)		$50
Include sampling supplies from other ALS location (yes/no) SEE COMMENTS		

Additional Information & Special Instructions or Requests

Check all that apply:
- [ ] Indoor Air
- [ ] Sub-Slab
- [ ] Industrial
- [x] Ambient Air
- [ ] Landfill
- [ ] Commercial
- [ ] Probe/Well
- [ ] Crawlspace
- [ ] Residential
- [ ] Other (specify):

COMMENTS:
Methane $100, Sulfurs $242, Canister 2WEEK rental $105

RENTAL COSTS: Canister Rental is 2 WEEKS only. After this time additional rental fees apply.

MEDIA REPLACEMENT COSTS: *(Media lost or damaged will be charged to the client)*
1) TD SORBENT TUBE & CAPS - $190.00 2) TD DIFFUSION CAP - $30.00 3) CAPLOK TOOL SET - $95.00 4) VACUUM GAUGE - $240.00 5) BOTTLEVAC CANISTER - $135.00
6) PROTECTIVE CAP - $35.00 7) CANISTER - 6L: $650.00; 1.4L: $450.00 8) CO[illegible] 0 GRAB: $850.00 9) CANISTER STAND - $75.00 10) DUPLICATE SAMPLER - $550.00

CERTIFICATE OF ANALYSIS

Work Order	:	**FJ2403535**			
Client	:	**Tetra Tech Canada Inc.**	Laboratory	:	ALS Environmental - Waterloo
Contact	:	Andrea McMillan	Account Manager	:	Brent Mack
Address	:	110, 140 Quarry Park Blvd SE Calgary Alberta Canada T2C 3G3	Address	:	60 Northland Road, Unit 1 Waterloo ON Canada N2V 2B8
Telephone	:	----	Telephone	:	778-370-3279
Project	:	704-ENW.GENV03704-02, Task 001	Date Samples Received	:	20-Nov-2024 12:45
PO	:	----	Date Analysis Commenced	:	22-Nov-2024
C-O-C number	:	----	Issue Date	:	27-Nov-2024 10:05
Sampler	:	Leroy Wolford			
Site	:	----			
Quote number	:	VA24-EBAE100-013			
No. of samples received	:	1			
No. of samples analysed	:	1			

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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*
David Tremblett	VOC Section Supervisor	Air Quality, Waterloo, Ontario

General Comments

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

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

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

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

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

Unit	*Description*
-	no units
inches Hg	inches of mercury
µg/m³	micrograms per cubic metre
ppbv	parts per billion (volume/volume)
%	percent

<: 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: Air
(Matrix: Air)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID	Location 3	----	----	----	----
					Client sampling date / time	20-Nov-2024 11:10	----	----	----	----
						FJ2403535-001	----	----	----	----
						Result	----	----	----	----
Field Tests										
ID, batch proof	----	EF001/WT	-	-		240728.222	----	----	----	----
ID, canister	----	EF001/WT	-	-		01400-0216	----	----	----	----
ID, regulator	----	EF001/WT	-	-		G289	----	----	----	----
Pressure on receipt	----	EF001/WT	0.10	inches Hg		-6.13	----	----	----	----
Sulfur Compounds										
Carbon disulfide	75-15-0	E630/WT	2.0	ppbv		<2.0	----	----	----	----
Carbon disulfide	75-15-0	EC630/WT	6.2	µg/m³		<6.2	----	----	----	----
Carbonyl sulfide	463-58-1	E630/WT	4.0	ppbv		<4.0	----	----	----	----
Carbonyl sulfide	463-58-1	EC630/WT	10	µg/m³		<10	----	----	----	----
Diethyl disulfide	110-81-6	E630/WT	2.0	ppbv		<2.0	----	----	----	----
Diethyl disulfide	110-81-6	EC630/WT	10	µg/m³		<10	----	----	----	----
Diethyl sulfide	352-93-2	E630/WT	4.0	ppbv		<4.0	----	----	----	----
Diethyl sulfide	352-93-2	EC630/WT	15	µg/m³		<15	----	----	----	----
Dimethyl disulfide	624-92-0	E630/WT	2.0	ppbv		<2.0	----	----	----	----
Dimethyl disulfide	624-92-0	EC630/WT	7.7	µg/m³		<7.7	----	----	----	----
Dimethyl sulfide	75-18-3	E630/WT	4.0	ppbv		<4.0	----	----	----	----
Dimethyl sulfide	75-18-3	EC630/WT	10	µg/m³		<10	----	----	----	----
Dimethylthiophene, 2,5-	638-02-8	E630/WT	4.0	ppbv		<4.0	----	----	----	----
Dimethylthiophene, 2,5-	638-02-8	EC630/WT	18	µg/m³		<18	----	----	----	----
Ethyl mercaptan	75-08-1	E630/WT	4.0	ppbv		<4.0	----	----	----	----
Ethyl mercaptan	75-08-1	EC630/WT	10	µg/m³		<10	----	----	----	----

Analytical Results

Sub-Matrix: Air (Matrix: Air)					Client sample ID	Location 3	----	----	----	----
					Client sampling date / time	20-Nov-2024 11:10	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit	FJ2403535-001	----	----	----	----	
					Result	----	----	----	----	
Sulfur Compounds										
Ethyl methyl sulfide	624-89-5	E630/WT	4.0	ppbv	<4.0	----	----	----	----	
Ethyl methyl sulfide	624-89-5	EC630/WT	12	µg/m³	<12	----	----	----	----	
Ethylthiophene, 2-	872-55-9	E630/WT	4.0	ppbv	<4.0	----	----	----	----	
Ethylthiophene, 2-	872-55-9	EC630/WT	18	µg/m³	<18	----	----	----	----	
Hydrogen sulfide	7783-06-4	E630/WT	4.0	ppbv	<4.0	----	----	----	----	
Hydrogen sulfide	7783-06-4	EC630/WT	5.6	µg/m³	<5.6	----	----	----	----	
Isobutyl mercaptan	513-44-0	E630/WT	4.0	ppbv	<4.0	----	----	----	----	
Isobutyl mercaptan	513-44-0	EC630/WT	15	µg/m³	<15	----	----	----	----	
Isopropyl mercaptan	75-33-2	E630/WT	4.0	ppbv	<4.0	----	----	----	----	
Isopropyl mercaptan	75-33-2	EC630/WT	12	µg/m³	<12	----	----	----	----	
Methyl mercaptan	74-93-1	E630/WT	4.0	ppbv	<4.0	----	----	----	----	
Methyl mercaptan	74-93-1	EC630/WT	7.9	µg/m³	<7.9	----	----	----	----	
Methylthiophene, 2-	554-14-3	E630/WT	4.0	ppbv	<4.0	----	----	----	----	
Methylthiophene, 2-	554-14-3	EC630/WT	16	µg/m³	<16	----	----	----	----	
Methylthiophene, 3-	616-44-4	E630/WT	4.0	ppbv	<4.0	----	----	----	----	
Methylthiophene, 3-	616-44-4	EC630/WT	16	µg/m³	<16	----	----	----	----	
n-Butyl mercaptan	109-79-5	E630/WT	4.0	ppbv	<4.0	----	----	----	----	
n-Butyl mercaptan	109-79-5	EC630/WT	15	µg/m³	<15	----	----	----	----	
Propyl mercaptan	107-03-9	E630/WT	4.0	ppbv	<4.0	----	----	----	----	
Propyl mercaptan	107-03-9	EC630/WT	12	µg/m³	<12	----	----	----	----	
sec-butyl mercaptan + thiophene	----	E630/WT	6.0	ppbv	<6.0	----	----	----	----	

Analytical Results

Sub-Matrix: Air (Matrix: Air)					Client sample ID	Location 3	----	----	----	----
					Client sampling date / time	20-Nov-2024 11:10	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		FJ2403535-001	----	----	----	----
						Result	----	----	----	----
Sulfur Compounds										
sec-butyl mercaptan + thiophene	----	EC630/WT	14	µg/m³		<21	----	----	----	----
t-Butyl mercaptan	75-66-1	E630/WT	4.0	ppbv		<4.0	----	----	----	----
t-Butyl mercaptan	75-66-1	EC630/WT	15	µg/m³		<15	----	----	----	----
Tetrahydrothiophene	110-01-0	E630/WT	4.0	ppbv		<4.0	----	----	----	----
Tetrahydrothiophene	110-01-0	EC630/WT	14	µg/m³		<14	----	----	----	----
Sulfur, total reduced (as H2S), 10 compounds	----	EC630/WT	16	µg/m³		<16	----	----	----	----
Sulfur, total reduced (as H2S), 22 compounds	----	EC630/WT	25	µg/m³		<25	----	----	----	----
Sulfur, total reduced (as H2S), NPRI 6	----	EC630/WT	12	µg/m³		<12	----	----	----	----
Sulfur, total reduced (as H2S), Ontario 4	----	EC630/WT	11	µg/m³		<11	----	----	----	----
Permanent Gases										
Methane	74-82-8	E629B-H/WT	0.050	%		<0.050	----	----	----	----

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

ALS Canada Ltd.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2403535**	Page	: 1 of 5
Client	: **Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Fort St. John
Contact	: Andrea McMillan	Account Manager	: Brent Mack
Address	: 110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: ----	Telephone	: 778-370-3279
Project	: 704-ENW.GENV03704-02, Task 001	Date Samples Received	: 20-Nov-2024 12:45
PO	: ----	Issue Date	: 27-Nov-2024 10:04
C-O-C number	: ----		
Sampler	: Leroy Wolford		
Site	: ----		
Quote number	: VA24-EBAE100-013		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) 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: **Air**

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*
Field Tests : Air Canister Information										
Canister Location 3	EF001	20-Nov-2024	----	----	----		22-Nov-2024	----	2 days	
Permanent Gases : Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)										
Canister Location 3	E629B-H	20-Nov-2024	----	----	----		26-Nov-2024	30 days	6 days	✓
Sulfur Compounds : Reduced Sulfur Compounds in Passivated Canisters by GC-SCD (All List) (ppbV)										
Canister Location 3	E630	20-Nov-2024	----	----	----		22-Nov-2024	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: **Air**

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)							
Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)	E629B-H	1784037	1	1	100.0	5.0	✓
Reduced Sulfur Compounds in Passivated Canisters by GC-SCD (All List) (ppbV)	E630	1779200	1	1	100.0	5.0	✓
Laboratory Control Samples (LCS)							
Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)	E629B-H	1784037	1	1	100.0	5.0	✓
Reduced Sulfur Compounds in Passivated Canisters by GC-SCD (All List) (ppbV)	E630	1779200	1	1	100.0	5.0	✓
Method Blanks (MB)							
Air Canister Information	EF001	1779225	1	20	5.0	5.0	✓
Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)	E629B-H	1784037	1	1	100.0	5.0	✓
Reduced Sulfur Compounds in Passivated Canisters by GC-SCD (All List) (ppbV)	E630	1779200	1	1	100.0	5.0	✓

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Permanent Gases (Methane, CO2, CO, N2, and O2) in Air (Routine Level, %)	E629B-H ALS Environmental - Waterloo	Air	EPA Method 3C & ASTM D1946	This analysis is performed using procedures adapted from EPA Method 3C & ASTM D1946. Air samples are collected into cleaned evacuated canisters. A volume of air is removed from the canister and injected by means of a gas-sampling/backflush valve onto a series of packed GC columns and measured using a thermal conductivity detector (TCD). Oxygen is not separated from Argon. Canister samples will be retained for 7 calendar days after final report. If you require a longer canister storage time, please contact your account manager.
Reduced Sulfur Compounds in Passivated Canisters by GC-SCD (All List) (ppbV)	E630 ALS Environmental - Waterloo	Air	ASTM D5504	This analysis is performed using procedures adapted from ASTM D5504. Air samples are collected into cleaned evacuated silica-coated canisters. By means of a loop system, a volume of air is transferred from the canister and cryofocused before determining the sulfur compounds by GC-SCD. Silica coated passivated canisters may allow for reliable sample analysis after 24 hours. In such cases, analysis is recommended within 7 days of collection. Canister samples will be retained for 7 calendar days after final report. If you require a longer canister storage time, please contact your Project Manager.
Reduced Sulfur Compounds in Passivated Canisters by GC-SCD (All List) (ug/m3)	EC630 ALS Environmental - Waterloo	Air	ASTM D5504	convert ppbv to ug/m3
Air Canister Information	EF001 ALS Environmental - Waterloo	Air	In-house	Air canister information provided by client and recorded on ALS report may affect the validity of results.

QUALITY CONTROL REPORT

Work Order	: **FJ2403535**	Page	: 1 of 5
Client	: Tetra Tech Canada Inc.	Laboratory	: ALS Environmental - Fort St. John
Contact	: Andrea McMillan	Account Manager	: Brent Mack
Address	: 110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: ----	Telephone	: 778-370-3279
Project	: 704-ENW.GENV03704-02, Task 001	Date Samples Received	: 20-Nov-2024 12:45
PO	: ----	Date Analysis Commenced	: 22-Nov-2024
C-O-C number	: ----	Issue Date	: 27-Nov-2024 10:04
Sampler	: Leroy Wolford		
Site	: ----		
Quote number	: VA24-EBAE100-013		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

This Quality Control Report contains the following information:

- Laboratory Duplicate (DUP) Report; Relative Percent Difference (RPD) and Data Quality Objectives
- 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*
David Tremblett	VOC Section Supervisor	Waterloo Air Quality, Waterloo, Ontario

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: **Air**

					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
Sulfur Compounds (QC Lot: 1779200)											
FJ2403535-001	Location 3	Carbon disulfide	75-15-0	E630	2.0	ppbv	<2.0	<2.0	0	Diff <2x LOR	----
		Carbonyl sulfide	463-58-1	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Diethyl disulfide	110-81-6	E630	2.0	ppbv	<2.0	<2.0	0	Diff <2x LOR	----
		Diethyl sulfide	352-93-2	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Dimethyl disulfide	624-92-0	E630	2.0	ppbv	<2.0	<2.0	0	Diff <2x LOR	----
		Dimethyl sulfide	75-18-3	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Dimethylthiophene, 2,5-	638-02-8	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Ethyl mercaptan	75-08-1	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Ethyl methyl sulfide	624-89-5	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Ethylthiophene, 2-	872-55-9	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Hydrogen sulfide	7783-06-4	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Isobutyl mercaptan	513-44-0	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Isopropyl mercaptan	75-33-2	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Methyl mercaptan	74-93-1	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Methylthiophene, 2-	554-14-3	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Methylthiophene, 3-	616-44-4	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		n-Butyl mercaptan	109-79-5	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Propyl mercaptan	107-03-9	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		sec-butyl mercaptan + thiophene	----	E630	6.0	ppbv	<6.0	<6.0	0	Diff <2x LOR	----
		t-Butyl mercaptan	75-66-1	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
		Tetrahydrothiophene	110-01-0	E630	4.0	ppbv	<4.0	<4.0	0	Diff <2x LOR	----
Permanent Gases (QC Lot: 1784037)											
FJ2403535-001	Location 3	Methane	74-82-8	E629B-H	0.050	%	<0.050	<0.050	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: **Air**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Field Tests (QCLot: 1779225)						
Pressure on receipt	----	EF001	0.1	Inches Hg	-30.0	----
Sulfur Compounds (QCLot: 1779200)						
Carbon disulfide	75-15-0	E630	2	ppbv	<2.0	----
Carbonyl sulfide	463-58-1	E630	4	ppbv	<4.0	----
Diethyl disulfide	110-81-6	E630	2	ppbv	<2.0	----
Diethyl sulfide	352-93-2	E630	4	ppbv	<4.0	----
Dimethyl disulfide	624-92-0	E630	2	ppbv	<2.0	----
Dimethyl sulfide	75-18-3	E630	4	ppbv	<4.0	----
Dimethylthiophene, 2,5-	638-02-8	E630	4	ppbv	<4.0	----
Ethyl mercaptan	75-08-1	E630	4	ppbv	<4.0	----
Ethyl methyl sulfide	624-89-5	E630	4	ppbv	<4.0	----
Ethylthiophene, 2-	872-55-9	E630	4	ppbv	<4.0	----
Hydrogen sulfide	7783-06-4	E630	4	ppbv	<4.0	----
Isobutyl mercaptan	513-44-0	E630	4	ppbv	<4.0	----
Isopropyl mercaptan	75-33-2	E630	4	ppbv	<4.0	----
Methyl mercaptan	74-93-1	E630	4	ppbv	<4.0	----
Methylthiophene, 2-	554-14-3	E630	4	ppbv	<4.0	----
Methylthiophene, 3-	616-44-4	E630	4	ppbv	<4.0	----
n-Butyl mercaptan	109-79-5	E630	4	ppbv	<4.0	----
Propyl mercaptan	107-03-9	E630	4	ppbv	<4.0	----
sec-butyl mercaptan + thiophene	----	E630	6	ppbv	<6.0	----
t-Butyl mercaptan	75-66-1	E630	4	ppbv	<4.0	----
Tetrahydrothiophene	110-01-0	E630	4	ppbv	<4.0	----
Permanent Gases (QCLot: 1784037)						
Methane	74-82-8	E629B-H	0.05	%	<0.050	----

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: **Air**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Sulfur Compounds (QCLot: 1779200)									
Carbonyl sulfide	463-58-1	E630	4	ppbv	104 ppbv	96.8	60.0	140	----
Hydrogen sulfide	7783-06-4	E630	4	ppbv	112 ppbv	118	60.0	140	----
Methyl mercaptan	74-93-1	E630	4	ppbv	101 ppbv	66.9	60.0	140	----
Permanent Gases (QCLot: 1784037)									
Methane	74-82-8	E629B-H	0.05	%	15 %	103	70.0	130	----

FJAE Shipping & Receiving
___ Call Out ___ Expedite
___ Priority
1 # of Coolers ___ Air
___ # of Carboys ___ Ground

Environmental Division
Fort St. John
Work Order Reference
FJ2403535

Telephone : +1 250 261 5517

60 NORTHLAND ROAD
WATERLOO, ON N2V 2B8
Phone: (519) 886-6910
Fax: (519) 886-9047
Toll Free: 1-800-668-9878

ALS Environmental

AIR QUALITY CHAIN OF CUSTODY FORM - Canister/Tube/Gas-Bag

Note: All TAT Quoted is in **business days** which exclude statutory holidays and weekends. TAT of samples received past 3:00 pm or Saturday / Sunday begin the next day.

DATE REQUIRED

SERVICE REQUESTED
- 10 day (regular) ☐
- Rush 5 day (50%) ☐
- Rush 3 day (100%) ☐
- Rush 2 day (200%) ☐
- Rush 1 day (300%) - Enquire ☐

All rush work requires lab approval before sample submission

COMPANY NAME	Tetra Tech Canada Inc.
OFFICE	
PROJECT MANAGER	
PROJECT #	VA24-EBAE100-013
PHONE	FAX
ACCOUNT #	
QUOTATION #	PO #

REGULATION
CRITERIA
OTHER INFORMATION

REPORT FORMAT/DISTRIBUTION

EMAIL____FAX____BOTH ____
SELECT: PDF____DIGITAL____BOTH __
EMAIL 1 _____
EMAIL 2 _____

SUBMISSION #:
ENTERED BY:
DATE/TIME ENTERED:
BIN #:

ANALYSIS REQUEST

SAMPLING INFORMATION

Sample Date/Time: Date (dd-mmm-yy)	Time (24hr) (hh:mm)	Canister or Tube ID# (e.g. 060000-XXXX or G0XXXXXXSVI)	Regulator Serial # CS1200-XXXX or GXX	Matrix Type	SAMPLE DESCRIPTION TO APPEAR ON REPORT	TUBE AIR VOLUME - L ☐ or m³ ☐	STARTING PRESSURE - Pre-Sampling ("Hg)	ENDING PRESSURE - Post Sampling ("Hg)	COLLECTION TIME (HRS)	Field Conditions (Rain/Wind/Dust/Odour) Field PID Reading	LAB ID
20-11-2024	11:10am	01400-0216	G289				30	8			

SPECIAL INSTRUCTIONS/COMMENTS

This Chain of Custody Form is only to be used for Air Quality Samples

Matrix Type: Soil Gas Vapour = SG; Indoor Air = IA; Ambient Air = AA; Industrial Hygiene = IH

SAMPLE CONDITION AS RECEIVED
- FROZEN ☐
- COLD ☐
- COOLING INITIATED ☐
- AMBIENT ☐

MEAN TEMP

SAMPLED BY: LEROY WOLFORD	DATE & TIME 20-11-2024	RECEIVED BY:	DATE & TIME	OBSERVATIONS Yes ☐ No ☐ If yes add SIF
RELINQUISHED BY:	DATE & TIME	RECEIVED AT LAB BY:	DATE & TIME	INIT

Notes

1. Quote number must be provided to ensure proper pricing

2. TAT may vary dependent on complexity of analysis and lab workload at time of submission. Please contact the lab to confirm TATs.

3. Any known or suspected hazards relating to a sample must be noted on the chain of custody in comments section.

REV6-2015

ALS FSJ — [redacted] NOV 20/24 - 12:45PM

ALS Environmental
60 Northland Drive, Unit 1
Waterloo, ON
N2V 2B8

AIR SAMPLING MEDIA REQUEST FORM

COMPLETE Blue sections. Grey sections are for INTERNAL USE ONLY
Form MUST be reviewed & initialled by an ALS Account Manager prior to submission to NAWTR AIRMEDIA REQUEST (nawtr.airmediarequest@alsglobal.com)

SHIPPING INFO: pls ship PUROLATOR Express Friday 6SEPT for delivery 9 SEPT latest for client p/u

CLIENT:	TetraTech	ORDER TAKEN BY:	Brent Meck
CLIENT CONTACT:	Andrea McMillan	ORDER DATE:	5-Sep-24
CLIENT PROJECT/PO:	Gas and GW sampling	AM REVIEWER:	DSTASTNY
QUOTE #: (mandatory)	VA24-EBAE100-013	CLIENT EXPECT DATE:	9-Sep-24
DELIVERY TO:	ALS Fort St John BC, 11007 Alaska Road, Fort St John , BC, V1J 6P3 for client P/U	ORDER FILLED BY:	AR21
TELEPHONE NUMBER:	587-830-1121	PEER REVIEWER:	YB
SHIP TO (include email):	andrea.mcmillan@tetratech.com	DATE COMPLETED:	5-Sep-24

Shipping Method: (Select one)
- ☐ o Regular (ALS will cover shipping cost)
- ☑ o RUSH(Client will be billed for shipping costs, please confirm with Account Manager)
- ☐ o External Courier
- ☐ o Pickup at ALS
- ☐ • Location:
- ☐ o ALS Drivers

Shipping Company:
- ◯ o FedEx
- ◉ o Purolator
- ◯ o DHL
- ◯ o UPS
- ◯ o Other
- ◯ o N/A

Tracking Number:

Completion of all Sections is Mandatory

1. What type of air is being sampled? ***Check all appropriate types in the Additional Information Box below***
2. Please provide a list of compounds and reporting limits that are required. ***Include regulation & target list (attach to email)***
3. What is your planned canister sampling time? ***Options listed under Regulator Times***
4. Trip blanks will be shipped pre-filled unless specifically requested below.

Note: If analysis required is DIFFERENT than what is LISTED on this form, email nawtr.airmediarequest@alsglobal.com ASAP to confirm the media was adequately proofed.

Canister Size/Tube	Regulator Times	Regulator Quantity	Parameters/ Product Codes	Canister/Tube Identification #	Initial Pressure/Flow (mmHg/mL per min)	Controller Identification #
6L Canister	24 hr					
	12 hr					
	8 hr					
	4 hr					
	1 hr					
	0.5 hr					
Number of Canisters	Trip Blank					
1.4L Canister	60 mins		Methane, S629M, Full Sulfur Scan S630	01400-0216	-28.7	G289
	20 mins			01400-0320	-28.7	G33
	10 mins					
	4 mins	2				
	No Restrictor					
Number of Canisters 2	Trip Blank					
Bottle Vacs	40 mins					
	14 mins					
	7 mins					
	3 mins					
	No Restrictor					
Number of Canisters	Trip Blank					
Passive CarboPak X Tubes						
Diffusive Caps						
Active SVI Tubes						
Calibration Tube for SVI (yes/no)						

Other Sampling Supplies	Quantity	ID #
Pressure Gauge	1	PG59
Caplok Tool		
Canister Stands		
Valve Adaptor for Soil Vapour		

Additional Information & Special Instructions or Requests

Check all that apply:
- ☐ Indoor Air
- ☐ Sub-Slab
- ☐ Industrial
- ☑ Ambient Air
- ☐ Landfill
- ☐ Commercial
- ☐ Probe/Well
- ☐ Crawlspace
- ☐ Residential
- ☐ Other (specify)

Chargeable Supplies		Quantity
Duplicate Sampler - $45 canister		
Valve Adaptor for Soil Vapour $5		
Teflon Tubing - $3 per foot	-Total length (ft)	
	-Length per section (ft)	
Nut & Ferrule Sets - $8 per set		
Tedlar Bags (contact the lab before SUBMITTING)	-$28 unpurged	
	-$45 purged	
Siloxane Kit - $100 each (Kit: $50, TD tube prep/rental: $50)		
Rush Order Prep Charge (<48 hour notice, not including shipping)		$50
Include sampling supplies from other ALS location (yes/no) SEE COMMENTS		

COMMENTS:
Methane $100, Sulfurs $242, Canister 2WEEK rental $105

RENTAL COSTS: Canister Rental is 2 WEEKS only. After this time additional rental fees apply.

MEDIA REPLACEMENT COSTS: *(Media lost or damaged will be charged to the client)*

1) TD SORBENT TUBE & CAPS - $190.00 2) TD DIFFUSION CAP - $30.00 3) CAPLOK TOOL SET - $95.00 4) VACUUM GAUGE - $240.00 5) BOTTLEVAC CANISTER - $135.00
6) PROTECTIVE CAP- $35.00 7) CANISTER - 6L: $650.00; 1.4L: $450.00 8) CONTROLLER - TWA: $1000.00 GRAB: $850.00 9) CANISTER STAND - $75.00 10) DUPLICATE SAMPLER - $550.00

CERTIFICATE OF ANALYSIS

Work Order	:	**FJ2403536**			
Client	:	**Tetra Tech Canada Inc.**	Laboratory	:	ALS Environmental - Vancouver
Contact	:	Andrea McMillan	Account Manager	:	Brent Mack
Address	:	110, 140 Quarry Park Blvd SE Calgary Alberta Canada T2C 3G3	Address	:	8081 Lougheed Highway Burnaby BC Canada V5A 1W9
Telephone	:	----	Telephone	:	778-370-3279
Project	:	704-ENW.GENV03704-02, Task 001	Date Samples Received	:	20-Nov-2024 12:45
PO	:	----	Date Analysis Commenced	:	21-Nov-2024
C-O-C number	:	20-964972	Issue Date	:	22-Nov-2024 16:46
Sampler	:	Leroy Wolford			
Site	:	----			
Quote number	:	VA24-EBAE100-013			
No. of samples received	:	1			
No. of samples analysed	:	1			

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

This Certificate of Analysis contains the following information:

- General Comments
- Analytical Results

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*
Erika Vanegas	Lab Assistant	Metals, Burnaby, British Columbia
Kate Dimitrova	Supervisor - Inorganic	Inorganics, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Metals, Burnaby, British Columbia
Monica Ko	Lab Assistant	Inorganics, Burnaby, British Columbia
Owen Cheng		Metals, Burnaby, British Columbia
Tracy Harley	Supervisor - Water Quality Instrumentation	Inorganics, Burnaby, British Columbia

General Comments

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

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

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

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

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

Unit	*Description*
mg/L	milligrams per litre
pH units	pH units
µS/cm	microsiemens per centimetre
NTU	nephelometric turbidity units
CU	colour units (1 cu = 1 mg/l pt)
AU/cm	absorbance units per centimetre
% T/cm	% transmittance per centimetre
-	no units

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

Test results reported relate only to the samples as received by the laboratory.
UNLESS OTHERWISE STATED on SRN or QCI Report, ALL SAMPLES WERE RECEIVED IN ACCEPTABLE CONDITION.

Sample Comments

Sample	*Client Id*	*Comment*
FJ2403536-001	Location 3	Water sample for total mercury analysis was not submitted in glass or PTFE container with HCl preservative. Results may be biased low.

Qualifiers

Qualifier	Description
DLA	Detection Limit adjusted for required dilution.
DLDS	Detection Limit Raised: Dilution required due to high Dissolved Solids / Electrical Conductivity.

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID				
					Location 3	----	----	----	----
					Client sampling date / time				
					20-Nov-2024 11:30	----	----	----	----
					FJ2403536-001	----	----	----	----
					Result	----	----	----	----
Physical Tests									
Absorbance, UV (@ 254nm)	----	E404/VA	0.0050	AU/cm	0.0830	----	----	----	----
Alkalinity, bicarbonate (as CaCO3)	----	E290/VA	1.0	mg/L	933	----	----	----	----
Alkalinity, carbonate (as CaCO3)	----	E290/VA	1.0	mg/L	13.3	----	----	----	----
Alkalinity, hydroxide (as CaCO3)	----	E290/VA	1.0	mg/L	<1.0	----	----	----	----
Alkalinity, phenolphthalein (as CaCO3)	----	E290/VA	1.0	mg/L	6.7	----	----	----	----
Alkalinity, total (as CaCO3)	----	E290/VA	1.0	mg/L	946	----	----	----	----
Colour, true	----	E329/VA	5.0	CU	<5.0	----	----	----	----
Conductivity	----	E100/VA	2.0	µS/cm	1890	----	----	----	----
Hardness (as CaCO3), dissolved	----	EC100/VA	0.60	mg/L	238	----	----	----	----
Hardness (as CaCO3), from total Ca/Mg	----	EC100A/VA	0.60	mg/L	251	----	----	----	----
pH	----	E108/VA	0.10	pH units	8.34	----	----	----	----
Solids, total dissolved [TDS]	----	E162/VA	10	mg/L	1230	----	----	----	----
Turbidity	----	E121/VA	0.10	NTU	26.0	----	----	----	----
Transmittance, UV (@ 254nm)	----	E404/VA	1.0	% T/cm	82.6	----	----	----	----
Anions and Nutrients									
Bromide	24959-67-9	E235.Br-L/VA	0.050	mg/L	<0.500 DLDS	----	----	----	----
Chloride	16887-00-6	E235.Cl/VA	0.50	mg/L	38.6	----	----	----	----
Fluoride	16984-48-8	E235.F/VA	0.020	mg/L	0.629	----	----	----	----
Nitrate (as N)	14797-55-8	E235.NO3-L/VA	0.0050	mg/L	<0.0500 DLDS	----	----	----	----
Nitrite (as N)	14797-65-0	E235.NO2-L/VA	0.0010	mg/L	<0.0100 DLDS	----	----	----	----
Sulfate (as SO4)	14808-79-8	E235.SO4/VA	0.30	mg/L	120	----	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Location 3	----	----	----	----
					Client sampling date / time	20-Nov-2024 11:30	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		FJ2403536-001	----	----	----	----
						Result	----	----	----	----
Cyanides										
Cyanide, strong acid dissociable (Total)	----	E333/VA	0.0050	mg/L		<0.0050	----	----	----	----
Organic / Inorganic Carbon										
Carbon, dissolved organic [DOC]	----	E358-L/VA	0.50	mg/L		4.00	----	----	----	----
Carbon, total organic [TOC]	----	E355-L/VA	0.50	mg/L		3.74	----	----	----	----
Total Sulfides										
Sulfide, total (as H2S)	7783-06-4	E395-H/VA	0.011	mg/L		<0.011	----	----	----	----
Sulfide, total (as S)	18496-25-8	E395-H/VA	0.010	mg/L		<0.010	----	----	----	----
Total Metals										
Aluminum, total	7429-90-5	E420/VA	0.0030	mg/L		0.165	----	----	----	----
Antimony, total	7440-36-0	E420/VA	0.00010	mg/L		0.00696	----	----	----	----
Arsenic, total	7440-38-2	E420/VA	0.00010	mg/L		0.0214	----	----	----	----
Barium, total	7440-39-3	E420/VA	0.00010	mg/L		0.467	----	----	----	----
Beryllium, total	7440-41-7	E420/VA	0.000100	mg/L		<0.000100	----	----	----	----
Bismuth, total	7440-69-9	E420/VA	0.000050	mg/L		<0.000100 DLA	----	----	----	----
Boron, total	7440-42-8	E420/VA	0.010	mg/L		0.352	----	----	----	----
Cadmium, total	7440-43-9	E420/VA	0.0000050	mg/L		0.000116	----	----	----	----
Calcium, total	7440-70-2	E420/VA	0.050	mg/L		41.0	----	----	----	----
Cesium, total	7440-46-2	E420/VA	0.000010	mg/L		0.000125	----	----	----	----
Chromium, total	7440-47-3	E420/VA	0.00050	mg/L		<0.00100 DLA	----	----	----	----
Cobalt, total	7440-48-4	E420/VA	0.00010	mg/L		0.00190	----	----	----	----
Copper, total	7440-50-8	E420/VA	0.00050	mg/L		0.00264	----	----	----	----

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID				
					Location 3	----	----	----	----
					Client sampling date / time				
					20-Nov-2024 11:30	----	----	----	----
					FJ2403536-001	----	----	----	----
					Result	----	----	----	----
Total Metals									
Iron, total	7439-89-6	E420/VA	0.010	mg/L	3.17	----	----	----	----
Lead, total	7439-92-1	E420/VA	0.000050	mg/L	0.000556	----	----	----	----
Lithium, total	7439-93-2	E420/VA	0.0010	mg/L	0.0154	----	----	----	----
Magnesium, total	7439-95-4	E420/VA	0.0050	mg/L	36.2	----	----	----	----
Manganese, total	7439-96-5	E420/VA	0.00010	mg/L	0.115	----	----	----	----
Mercury, total	7439-97-6	E508/VA	0.0000050	mg/L	<0.0000050	----	----	----	----
Molybdenum, total	7439-98-7	E420/VA	0.000050	mg/L	0.0335	----	----	----	----
Nickel, total	7440-02-0	E420/VA	0.00050	mg/L	0.0119	----	----	----	----
Phosphorus, total	7723-14-0	E420/VA	0.050	mg/L	<0.100 DLA	----	----	----	----
Potassium, total	7440-09-7	E420/VA	0.050	mg/L	3.39	----	----	----	----
Rubidium, total	7440-17-7	E420/VA	0.00020	mg/L	0.00270	----	----	----	----
Selenium, total	7782-49-2	E420/VA	0.000050	mg/L	0.00315	----	----	----	----
Silicon, total	7440-21-3	E420/VA	0.10	mg/L	4.68	----	----	----	----
Silver, total	7440-22-4	E420/VA	0.000010	mg/L	<0.000020 DLA	----	----	----	----
Sodium, total	7440-23-5	E420/VA	0.050	mg/L	395	----	----	----	----
Strontium, total	7440-24-6	E420/VA	0.00020	mg/L	0.665	----	----	----	----
Sulfur, total	7704-34-9	E420/VA	0.50	mg/L	48.8	----	----	----	----
Tellurium, total	13494-80-9	E420/VA	0.00020	mg/L	<0.00040 DLA	----	----	----	----
Thallium, total	7440-28-0	E420/VA	0.000010	mg/L	0.000028	----	----	----	----
Thorium, total	7440-29-1	E420/VA	0.00010	mg/L	<0.00020 DLA	----	----	----	----
Tin, total	7440-31-5	E420/VA	0.00010	mg/L	<0.00020 DLA	----	----	----	----

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID				
					Location 3	----	----	----	----
					Client sampling date / time				
					20-Nov-2024 11:30	----	----	----	----
					FJ2403536-001	----	----	----	----
					Result	----	----	----	----
Total Metals									
Titanium, total	7440-32-6	E420/VA	0.00030	mg/L	0.00554	----	----	----	----
Tungsten, total	7440-33-7	E420/VA	0.00010	mg/L	0.00033	----	----	----	----
Uranium, total	7440-61-1	E420/VA	0.000010	mg/L	0.00695	----	----	----	----
Vanadium, total	7440-62-2	E420/VA	0.00050	mg/L	0.00127	----	----	----	----
Zinc, total	7440-66-6	E420/VA	0.0030	mg/L	0.0092	----	----	----	----
Zirconium, total	7440-67-7	E420/VA	0.00020	mg/L	0.00064	----	----	----	----
Dissolved Metals									
Aluminum, dissolved	7429-90-5	E421/VA	0.0010	mg/L	0.0027	----	----	----	----
Antimony, dissolved	7440-36-0	E421/VA	0.00010	mg/L	0.00671	----	----	----	----
Arsenic, dissolved	7440-38-2	E421/VA	0.00010	mg/L	0.00623	----	----	----	----
Barium, dissolved	7440-39-3	E421/VA	0.00010	mg/L	0.418	----	----	----	----
Beryllium, dissolved	7440-41-7	E421/VA	0.000100	mg/L	<0.000100	----	----	----	----
Bismuth, dissolved	7440-69-9	E421/VA	0.000050	mg/L	<0.000100 DLA	----	----	----	----
Boron, dissolved	7440-42-8	E421/VA	0.010	mg/L	0.329	----	----	----	----
Cadmium, dissolved	7440-43-9	E421/VA	0.0000050	mg/L	0.0000734	----	----	----	----
Calcium, dissolved	7440-70-2	E421/VA	0.050	mg/L	38.9	----	----	----	----
Cesium, dissolved	7440-46-2	E421/VA	0.000010	mg/L	0.000078	----	----	----	----
Chromium, dissolved	7440-47-3	E421/VA	0.00050	mg/L	<0.00100 DLA	----	----	----	----
Cobalt, dissolved	7440-48-4	E421/VA	0.00010	mg/L	0.00174	----	----	----	----
Copper, dissolved	7440-50-8	E421/VA	0.00020	mg/L	0.00055	----	----	----	----
Iron, dissolved	7439-89-6	E421/VA	0.010	mg/L	0.787	----	----	----	----

Analytical Results

Sub-Matrix: Water
(Matrix: Water)

Analyte	CAS Number	Method/Lab	LOR	Unit	Client sample ID				
					Location 3	----	----	----	----
					Client sampling date / time				
					20-Nov-2024 11:30	----	----	----	----
					FJ2403536-001	----	----	----	----
					Result	----	----	----	----
Dissolved Metals									
Lead, dissolved	7439-92-1	E421/VA	0.000050	mg/L	<0.000100 DLA	----	----	----	----
Lithium, dissolved	7439-93-2	E421/VA	0.0010	mg/L	0.0141	----	----	----	----
Magnesium, dissolved	7439-95-4	E421/VA	0.0050	mg/L	34.2	----	----	----	----
Manganese, dissolved	7439-96-5	E421/VA	0.00010	mg/L	0.112	----	----	----	----
Mercury, dissolved	7439-97-6	E509/VA	0.0000050	mg/L	<0.0000050	----	----	----	----
Molybdenum, dissolved	7439-98-7	E421/VA	0.000050	mg/L	0.0304	----	----	----	----
Nickel, dissolved	7440-02-0	E421/VA	0.00050	mg/L	0.0111	----	----	----	----
Phosphorus, dissolved	7723-14-0	E421/VA	0.050	mg/L	<0.100 DLA	----	----	----	----
Potassium, dissolved	7440-09-7	E421/VA	0.050	mg/L	3.39	----	----	----	----
Rubidium, dissolved	7440-17-7	E421/VA	0.00020	mg/L	0.00238	----	----	----	----
Selenium, dissolved	7782-49-2	E421/VA	0.000050	mg/L	0.00301	----	----	----	----
Silicon, dissolved	7440-21-3	E421/VA	0.050	mg/L	4.07	----	----	----	----
Silver, dissolved	7440-22-4	E421/VA	0.000010	mg/L	<0.000020 DLA	----	----	----	----
Sodium, dissolved	7440-23-5	E421/VA	0.050	mg/L	401	----	----	----	----
Strontium, dissolved	7440-24-6	E421/VA	0.00020	mg/L	0.598	----	----	----	----
Sulfur, dissolved	7704-34-9	E421/VA	0.50	mg/L	42.8	----	----	----	----
Tellurium, dissolved	13494-80-9	E421/VA	0.00020	mg/L	<0.00040 DLA	----	----	----	----
Thallium, dissolved	7440-28-0	E421/VA	0.000010	mg/L	0.000023	----	----	----	----
Thorium, dissolved	7440-29-1	E421/VA	0.00010	mg/L	<0.00020 DLA	----	----	----	----
Tin, dissolved	7440-31-5	E421/VA	0.00010	mg/L	<0.00020 DLA	----	----	----	----
Titanium, dissolved	7440-32-6	E421/VA	0.00030	mg/L	<0.00060 DLA	----	----	----	----

Analytical Results

Sub-Matrix: Water (Matrix: Water)					Client sample ID	Location 3	----	----	----	----
					Client sampling date / time	20-Nov-2024 11:30	----	----	----	----
Analyte	CAS Number	Method/Lab	LOR	Unit		FJ2403536-001	----	----	----	----
						Result	----	----	----	----
Dissolved Metals										
Tungsten, dissolved	7440-33-7	E421/VA	0.00010	mg/L		0.00030	----	----	----	----
Uranium, dissolved	7440-61-1	E421/VA	0.000010	mg/L		0.00624	----	----	----	----
Vanadium, dissolved	7440-62-2	E421/VA	0.00050	mg/L		<0.00100 DLA	----	----	----	----
Zinc, dissolved	7440-66-6	E421/VA	0.0010	mg/L		0.0043	----	----	----	----
Zirconium, dissolved	7440-67-7	E421/VA	0.00020	mg/L		0.00041	----	----	----	----
Dissolved mercury filtration location	----	EP509/VA	-	-		Field	----	----	----	----
Dissolved metals filtration location	----	EP421/VA	-	-		Field	----	----	----	----

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

ALS Canada Ltd.

QUALITY CONTROL INTERPRETIVE REPORT

Work Order	: **FJ2403536**	Page	: 1 of 11
Client	: **Tetra Tech Canada Inc.**	Laboratory	: ALS Environmental - Fort St. John
Contact	: Andrea McMillan	Account Manager	: Brent Mack
Address	: 110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: ----	Telephone	: 778-370-3279
Project	: 704-ENW.GENV03704-02, Task 001	Date Samples Received	: 20-Nov-2024 12:45
PO	: ----	Issue Date	: 22-Nov-2024 16:46
C-O-C number	: 20-964972		
Sampler	: Leroy Wolford		
Site	: ----		
Quote number	: VA24-EBAE100-013		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

Key

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

Workorder Comments

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

Summary of Outliers

Outliers : Quality Control Samples

- No Method Blank value outliers occur.
- No Duplicate outliers occur.
- No Laboratory Control Sample (LCS) outliers occur
- No Matrix Spike outliers occur.
- No Test sample Surrogate recovery outliers exist.

Outliers: Reference Material (RM) Samples

- No Reference Material (RM) Sample outliers occur.

Outliers : Analysis Holding Time Compliance (Breaches)

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

Outliers : Frequency of Quality Control Samples

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

Analysis Holding Time Compliance

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

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

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

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

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	Method	Sampling Date	Extraction / Preparation				Analysis			
			Preparation Date	Holding Times Rec	Holding Times Actual	Eval	Analysis Date	Holding Times Rec	Holding Times Actual	Eval
Anions and Nutrients : Bromide in Water by IC (Low Level)										
HDPE Location 3	E235.Br-L	20-Nov-2024	22-Nov-2024	28 days	2 days	✓	22-Nov-2024	28 days	2 days	✓
Anions and Nutrients : Chloride in Water by IC										
HDPE Location 3	E235.Cl	20-Nov-2024	22-Nov-2024	28 days	2 days	✓	22-Nov-2024	28 days	2 days	✓
Anions and Nutrients : Fluoride in Water by IC										
HDPE Location 3	E235.F	20-Nov-2024	22-Nov-2024	28 days	2 days	✓	22-Nov-2024	28 days	2 days	✓
Anions and Nutrients : Nitrate in Water by IC (Low Level)										
HDPE Location 3	E235.NO3-L	20-Nov-2024	22-Nov-2024	3 days	2 days	✓	22-Nov-2024	3 days	2 days	✓
Anions and Nutrients : Nitrite in Water by IC (Low Level)										
HDPE Location 3	E235.NO2-L	20-Nov-2024	22-Nov-2024	3 days	2 days	✓	22-Nov-2024	3 days	2 days	✓
Anions and Nutrients : Sulfate in Water by IC										
HDPE Location 3	E235.SO4	20-Nov-2024	22-Nov-2024	28 days	2 days	✓	22-Nov-2024	28 days	2 days	✓
Cyanides : Total Cyanide										
UV-inhibited HDPE - total (sodium hydroxide) Location 3	E333	20-Nov-2024	22-Nov-2024	14 days	2 days	✓	22-Nov-2024	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
Dissolved Metals : Dissolved Mercury in Water by CVAAS										
Glass vial dissolved (hydrochloric acid)										
Location 3	E509	20-Nov-2024	22-Nov-2024	28 days	2 days	✓	22-Nov-2024	28 days	2 days	✓
Dissolved Metals : Dissolved Metals in Water by CRC ICPMS										
HDPE dissolved (nitric acid)										
Location 3	E421	20-Nov-2024	22-Nov-2024	180 days	2 days	✓	22-Nov-2024	180 days	2 days	✓
Organic / Inorganic Carbon : Dissolved Organic Carbon by Combustion (Low Level)										
Amber glass dissolved (sulfuric acid)										
Location 3	E358-L	20-Nov-2024	21-Nov-2024	28 days	1 days	✓	21-Nov-2024	28 days	1 days	✓
Organic / Inorganic Carbon : Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)										
Amber glass total (lab preserved)										
Location 3	E355-L	20-Nov-2024	21-Nov-2024	3 days	1 days	✓	21-Nov-2024	28 days	0 days	✓
Physical Tests : Alkalinity Species by Titration										
HDPE										
Location 3	E290	20-Nov-2024	22-Nov-2024	14 days	2 days	✓	22-Nov-2024	14 days	2 days	✓
Physical Tests : Colour (True) by Spectrometer (5 CU)										
HDPE										
Location 3	E329	20-Nov-2024	22-Nov-2024	3 days	2 days	✓	22-Nov-2024	3 days	2 days	✓
Physical Tests : Conductivity in Water										
HDPE										
Location 3	E100	20-Nov-2024	22-Nov-2024	28 days	2 days	✓	22-Nov-2024	28 days	2 days	✓
Physical Tests : pH by Meter										
HDPE										
Location 3	E108	20-Nov-2024	22-Nov-2024	0.25 hrs	38 hrs	× EHTR-FM	22-Nov-2024	0.25 hrs	43 hrs	× EHTR-FM
Physical Tests : TDS by Gravimetry										
HDPE										
Location 3	E162	20-Nov-2024	----	----	----		21-Nov-2024	7 days	1 days	✓

Matrix: **Water**

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

Analyte Group : Analytical Method / Container / Client Sample ID(s)	*Method*	*Sampling Date*	*Extraction / Preparation*				*Analysis*			
			Preparation Date	*Holding Times* Rec	*Holding Times* Actual	*Eval*	*Analysis Date*	*Holding Times* Rec	*Holding Times* Actual	*Eval*
Physical Tests : Turbidity by Nephelometry										
HDPE Location 3	E121	20-Nov-2024	----	----	----		22-Nov-2024	3 days	2 days	✓
Physical Tests : UV Absorbance and Transmittance by Spectrometry										
HDPE Location 3	E404	20-Nov-2024	----	----	----		22-Nov-2024	3 days	2 days	✓
Total Metals : Total Mercury in Water by CVAAS										
HDPE - total (lab preserved) Location 3	E508	20-Nov-2024	22-Nov-2024	0 hrs	38 hrs	× UCP	22-Nov-2024	0 hrs	38 hrs	× UCP
Total Metals : Total Metals in Water by CRC ICPMS										
HDPE - total (lab preserved) Location 3	E420	20-Nov-2024	22-Nov-2024	180 days	2 days	✓	22-Nov-2024	180 days	2 days	✓
Total Sulfides : Total Sulfide by Colourimetry (Automated Flow)										
HDPE total (zinc acetate+sodium hydroxide) Location 3	E395-H	20-Nov-2024	----	----	----		21-Nov-2024	7 days	1 days	✓

Legend & Qualifier Definitions

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

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

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

Quality Control Parameter Frequency Compliance

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

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Laboratory Duplicates (DUP)							
Alkalinity Species by Titration	E290	1778435	1	8	12.5	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	1778439	1	8	12.5	5.0	✓
Chloride in Water by IC	E235.Cl	1778438	1	9	11.1	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	1778443	1	1	100.0	5.0	✓
Conductivity in Water	E100	1778436	1	5	20.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1778479	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1778107	1	2	50.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1777537	1	1	100.0	5.0	✓
Fluoride in Water by IC	E235.F	1778437	1	9	11.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1778440	1	8	12.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1778441	1	8	12.5	5.0	✓
pH by Meter	E108	1778434	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	1778442	1	11	9.0	5.0	✓
TDS by Gravimetry	E162	1778085	1	18	5.5	5.0	✓
Total Cyanide	E333	1778955	1	1	100.0	5.0	✓
Total Mercury in Water by CVAAS	E508	1778474	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1777978	1	2	50.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1777538	1	1	100.0	5.0	✓
Total Sulfide by Colourimetry (Automated Flow)	E395-H	1778131	1	1	100.0	5.0	✓
Turbidity by Nephelometry	E121	1779281	1	20	5.0	5.0	✓
UV Absorbance and Transmittance by Spectrometry	E404	1779752	1	1	100.0	5.0	✓
Laboratory Control Samples (LCS)							
Alkalinity Species by Titration	E290	1778435	1	8	12.5	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	1778439	1	8	12.5	5.0	✓
Chloride in Water by IC	E235.Cl	1778438	1	9	11.1	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	1778443	1	1	100.0	5.0	✓
Conductivity in Water	E100	1778436	1	5	20.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1778479	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1778107	1	2	50.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1777537	1	1	100.0	5.0	✓
Fluoride in Water by IC	E235.F	1778437	1	9	11.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1778440	1	8	12.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1778441	1	8	12.5	5.0	✓
pH by Meter	E108	1778434	1	14	7.1	5.0	✓
Sulfate in Water by IC	E235.SO4	1778442	1	11	9.0	5.0	✓
TDS by Gravimetry	E162	1778085	1	18	5.5	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 Cyanide	E333	1778955	1	1	100.0	5.0	✓
Total Mercury in Water by CVAAS	E508	1778474	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1777978	1	2	50.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1777538	1	1	100.0	5.0	✓
Total Sulfide by Colourimetry (Automated Flow)	E395-H	1778131	1	1	100.0	5.0	✓
Turbidity by Nephelometry	E121	1779281	1	20	5.0	5.0	✓
UV Absorbance and Transmittance by Spectrometry	E404	1779752	1	1	100.0	5.0	✓
Method Blanks (MB)							
Alkalinity Species by Titration	E290	1778435	1	8	12.5	5.0	✓
Bromide in Water by IC (Low Level)	E235.Br-L	1778439	1	8	12.5	5.0	✓
Chloride in Water by IC	E235.Cl	1778438	1	9	11.1	5.0	✓
Colour (True) by Spectrometer (5 CU)	E329	1778443	1	1	100.0	5.0	✓
Conductivity in Water	E100	1778436	1	5	20.0	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1778479	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1778107	1	2	50.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1777537	1	1	100.0	5.0	✓
Fluoride in Water by IC	E235.F	1778437	1	9	11.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1778440	1	8	12.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1778441	1	8	12.5	5.0	✓
Sulfate in Water by IC	E235.SO4	1778442	1	11	9.0	5.0	✓
TDS by Gravimetry	E162	1778085	1	18	5.5	5.0	✓
Total Cyanide	E333	1778955	1	1	100.0	5.0	✓
Total Mercury in Water by CVAAS	E508	1778474	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1777978	1	2	50.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1777538	1	1	100.0	5.0	✓
Total Sulfide by Colourimetry (Automated Flow)	E395-H	1778131	1	1	100.0	5.0	✓
Turbidity by Nephelometry	E121	1779281	1	20	5.0	5.0	✓
UV Absorbance and Transmittance by Spectrometry	E404	1779752	1	1	100.0	5.0	✓
Matrix Spikes (MS)							
Bromide in Water by IC (Low Level)	E235.Br-L	1778439	1	8	12.5	5.0	✓
Chloride in Water by IC	E235.Cl	1778438	1	9	11.1	5.0	✓
Dissolved Mercury in Water by CVAAS	E509	1778479	1	20	5.0	5.0	✓
Dissolved Metals in Water by CRC ICPMS	E421	1778107	1	2	50.0	5.0	✓
Dissolved Organic Carbon by Combustion (Low Level)	E358-L	1777537	0	1	0.0	5.0	×
Fluoride in Water by IC	E235.F	1778437	1	9	11.1	5.0	✓
Nitrate in Water by IC (Low Level)	E235.NO3-L	1778440	1	8	12.5	5.0	✓
Nitrite in Water by IC (Low Level)	E235.NO2-L	1778441	1	8	12.5	5.0	✓
Sulfate in Water by IC	E235.SO4	1778442	1	11	9.0	5.0	✓
Total Cyanide	E333	1778955	0	1	0.0	5.0	×

Matrix: **Water**

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

Quality Control Sample Type			Count		Frequency (%)		
Analytical Methods	*Method*	*QC Lot #*	*QC*	*Regular*	*Actual*	*Expected*	*Evaluation*
Matrix Spikes (MS) - Continued							
Total Mercury in Water by CVAAS	E508	1778474	1	20	5.0	5.0	✓
Total Metals in Water by CRC ICPMS	E420	1777978	1	2	50.0	5.0	✓
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L	1777538	0	1	0.0	5.0	✗
Total Sulfide by Colourimetry (Automated Flow)	E395-H	1778131	0	1	0.0	5.0	✗

Methodology References and Summaries

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

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Conductivity in Water	E100 ALS Environmental - Vancouver	Water	APHA 2510 (mod)	Conductivity, also known as Electrical Conductivity (EC) or Specific Conductance, is measured by immersion of a conductivity cell with platinum electrodes into a water sample. Conductivity measurements are temperature-compensated to 25°C.
pH by Meter	E108 ALS Environmental - Vancouver	Water	APHA 4500-H (mod)	pH is determined by potentiometric measurement with a pH electrode, and is conducted at ambient laboratory temperature (normally 20 ± 5°C). For high accuracy test results, pH should be measured in the field within the recommended 15 minute hold time.
Turbidity by Nephelometry	E121 ALS Environmental - Vancouver	Water	APHA 2130 B (mod)	Turbidity is measured by the nephelometric method, by measuring the intensity of light scatter under defined conditions.
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.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
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.
Colour (True) by Spectrometer (5 CU)	E329 ALS Environmental - Vancouver	Water	APHA 2120 C (mod)	Colour (True Colour) is determined by filtering a sample through a 0.45 micron membrane filter followed by analysis of the filtrate using the platinum-cobalt colourimetric method. Colour measurements can be highly pH dependent, and apply to the pH of the sample as received (at time of testing), without pH adjustment.
Total Cyanide	E333 ALS Environmental - Vancouver	Water	ISO 14403 (mod)	Total or Strong Acid Dissociable (SAD) Cyanide is determined by Continuous Flow Analyzer (CFA) with in-line UV digestion followed by colourmetric analysis. Method Limitation: High levels of thiocyanate (SCN) may cause positive interference (up to 0.5% of SCN concentration).
Total Organic Carbon (Non-Purgeable) by Combustion (Low Level)	E355-L ALS Environmental - Vancouver	Water	APHA 5310 B (mod)	Total Organic Carbon (Non-Purgeable), also known as NPOC (total), is a direct measurement of TOC after an acidified sample has been purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of total carbon (TC) is comprised of IC (which is common), this method is more accurate and more reliable than the TOC by subtraction method (i.e. TC minus TIC).
Dissolved Organic Carbon by Combustion (Low Level)	E358-L ALS Environmental - Vancouver	Water	APHA 5310 B (mod)	Dissolved Organic Carbon (Non-Purgeable), also known as NPOC (dissolved), is a direct measurement of DOC after a filtered (0.45 micron) sample has been acidified and purged to remove inorganic carbon (IC). Analysis is by high temperature combustion with infrared detection of CO_2. NPOC does not include volatile organic species that are purged off with IC. For samples where the majority of DC (dissolved carbon) is comprised of IC (which is common), this method is more accurate and more reliable than the DOC by subtraction method (i.e. DC minus DIC).
Total Sulfide by Colourimetry (Automated Flow)	E395-H ALS Environmental - Vancouver	Water	APHA 4500 -S E-Auto-Colorimetry	Sulfide is determined using the gas dialysis automated methlyene blue colourimetric method. Results expressed "as H_2S" if reported represent the maximum possible H_2S concentration based on the total sulfide concentration in the sample. The H_2S calculation converts Total Sulphide as (S2-) and reports it as Total Sulphide as (H_2S)
UV Absorbance and Transmittance by Spectrometry	E404 ALS Environmental - Vancouver	Water	APHA 5910 B (mod)	UV Absorbance is determined by first filtering a sample through a 0.45 micron filter, followed by UV absorbance measurement in a quartz cell at 254 nm. The analysis is carried out without pH adjustment.
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.

Analytical Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
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
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.
Dissolved Hardness (Calculated)	EC100 ALS Environmental - Vancouver	Water	APHA 2340B	"Hardness (as CaCO3), dissolved" is calculated from the sum of dissolved Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations.
Hardness (Calculated) from Total Ca/Mg	EC100A ALS Environmental - Vancouver	Water	APHA 2340B	"Hardness (as CaCO3), from total Ca/Mg" is calculated from the sum of total Calcium and Magnesium concentrations, expressed in CaCO3 equivalents. "Total Hardness" refers to the sum of Calcium and Magnesium Hardness. Hardness is normally or preferentially calculated from dissolved Calcium and Magnesium concentrations, because it is a property of water due to dissolved divalent cations. Hardness from total Ca/Mg is normally comparable to Dissolved Hardness in non-turbid waters.

Preparation Methods	Method / Lab	Matrix	Method Reference	Method Descriptions
Preparation for Total Organic Carbon by Combustion	EP355 ALS Environmental - Vancouver	Water		Preparation for Total Organic Carbon by Combustion
Preparation for Dissolved Organic Carbon for Combustion	EP358 ALS Environmental - Vancouver	Water	APHA 5310 B (mod)	Preparation for Dissolved Organic Carbon
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	: **FJ2403536**	Page	: 1 of 17
Client	: Tetra Tech Canada Inc.	Laboratory	: ALS Environmental - Fort St. John
Contact	: Andrea McMillan	Account Manager	: Brent Mack
Address	: 110, 140 Quarry Park Blvd SE Calgary AB Canada T2C 3G3	Address	: 11007 Alaska Road Fort St. John, British Columbia Canada V1J 6P3
Telephone	: ----	Telephone	: 778-370-3279
Project	: 704-ENW.GENV03704-02, Task 001	Date Samples Received	: 20-Nov-2024 12:45
PO	: ----	Date Analysis Commenced	: 21-Nov-2024
C-O-C number	: 20-964972	Issue Date	: 22-Nov-2024 16:46
Sampler	: Leroy Wolford		
Site	: ----		
Quote number	: VA24-EBAE100-013		
No. of samples received	: 1		
No. of samples analysed	: 1		

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

This Quality Control Report contains the following information:

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

Signatories

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

Signatories	*Position*	*Laboratory Department*
Erika Vanegas	Lab Assistant	Vancouver Metals, Burnaby, British Columbia
Kate Dimitrova	Supervisor - Inorganic	Vancouver Inorganics, Burnaby, British Columbia
Kim Jensen	Department Manager - Metals	Vancouver Metals, Burnaby, British Columbia
Monica Ko	Lab Assistant	Vancouver Inorganics, Burnaby, British Columbia
Owen Cheng		Vancouver Metals, Burnaby, British Columbia
Tracy Harley	Supervisor - Water Quality Instrumentation	Vancouver Inorganics, Burnaby, British Columbia

General Comments

The ALS Quality Control (QC) report is optionally provided to ALS clients upon request. ALS test methods include comprehensive QC checks with every analysis to ensure our high standards of quality are met. Each QC result has a known or expected target value, which is compared against predetermined Data Quality Objectives (DQOs) to provide confidence in the accuracy of associated test results. This report contains detailed results for all QC results applicable to this sample submission. Please refer to the ALS Quality Control Interpretation report (QCI) for applicable method references and methodology summaries.

Key :

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

Workorder Comments

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

Laboratory Duplicate (DUP) Report

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

Sub-Matrix: **Water**

					Laboratory Duplicate (DUP) Report						
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	LOR	Unit	Original Result	Duplicate Result	RPD(%) or Difference	Duplicate Limits	Qualifier
Physical Tests (QC Lot: 1778085)											
FJ2403536-001	Location 3	Solids, total dissolved [TDS]	----	E162	20	mg/L	1230	1240	0.727%	20%	----
Physical Tests (QC Lot: 1778434)											
FJ2403536-001	Location 3	pH	----	E108	0.10	pH units	8.34	8.34	0.00%	4%	----
Physical Tests (QC Lot: 1778435)											
FJ2403536-001	Location 3	Alkalinity, bicarbonate (as CaCO3)	----	E290	1.0	mg/L	933	934	0.162%	200%	----
		Alkalinity, carbonate (as CaCO3)	----	E290	1.0	mg/L	13.3	14.7	10.1%	200%	----
		Alkalinity, hydroxide (as CaCO3)	----	E290	1.0	mg/L	<1.0	<1.0	0.00%	200%	----
		Alkalinity, phenolphthalein (as CaCO3)	----	E290	1.0	mg/L	6.7	7.4	0.7	Diff <2x LOR	----
		Alkalinity, total (as CaCO3)	----	E290	1.0	mg/L	946	949	0.309%	20%	----
Physical Tests (QC Lot: 1778436)											
FJ2403536-001	Location 3	Conductivity	----	E100	2.0	µS/cm	1890	1890	0.106%	10%	----
Physical Tests (QC Lot: 1778443)											
FJ2403536-001	Location 3	Colour, true	----	E329	5.0	CU	<5.0	<5.0	0	Diff <2x LOR	----
Physical Tests (QC Lot: 1779281)											
FJ2403536-001	Location 3	Turbidity	----	E121	0.10	NTU	26.0	26.0	0.00%	15%	----
Physical Tests (QC Lot: 1779752)											
FJ2403536-001	Location 3	Absorbance, UV (@ 254nm)	----	E404	0.0050	AU/cm	0.0830	0.0830	0.00%	20%	----
Anions and Nutrients (QC Lot: 1778437)											
FJ2403536-001	Location 3	Fluoride	16984-48-8	E235.F	0.200	mg/L	0.629	0.604	0.025	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1778438)											
FJ2403536-001	Location 3	Chloride	16887-00-6	E235.Cl	5.00	mg/L	38.6	37.6	0.92	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1778439)											
FJ2403536-001	Location 3	Bromide	24959-67-9	E235.Br-L	0.500	mg/L	<0.500	<0.500	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1778440)											
FJ2403536-001	Location 3	Nitrate (as N)	14797-55-8	E235.NO3-L	0.0500	mg/L	<0.0500	<0.0500	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1778441)											
FJ2403536-001	Location 3	Nitrite (as N)	14797-65-0	E235.NO2-L	0.0100	mg/L	<0.0100	<0.0100	0	Diff <2x LOR	----
Anions and Nutrients (QC Lot: 1778442)											
FJ2403536-001	Location 3	Sulfate (as SO4)	14808-79-8	E235.SO4	3.00	mg/L	120	117	3.07%	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*
Cyanides (QC Lot: 1778955)											
FJ2403536-001	Location 3	Cyanide, strong acid dissociable (Total)	----	E333	0.0050	mg/L	<0.0050	<0.0050	0	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 1777537)											
FJ2403536-001	Location 3	Carbon, dissolved organic [DOC]	----	E358-L	0.50	mg/L	4.00	3.67	0.33	Diff <2x LOR	----
Organic / Inorganic Carbon (QC Lot: 1777538)											
FJ2403536-001	Location 3	Carbon, total organic [TOC]	----	E355-L	0.50	mg/L	3.74	3.72	0.02	Diff <2x LOR	----
Total Sulfides (QC Lot: 1778131)											
FJ2403536-001	Location 3	Sulfide, total (as S)	18496-25-8	E395-H	0.010	mg/L	<0.010	<0.010	0	Diff <2x LOR	----
Total Metals (QC Lot: 1777978)											
FJ2403536-001	Location 3	Aluminum, total	7429-90-5	E420	0.0060	mg/L	0.165	0.185	11.2%	20%	----
		Antimony, total	7440-36-0	E420	0.00020	mg/L	0.00696	0.00715	2.66%	20%	----
		Arsenic, total	7440-38-2	E420	0.00020	mg/L	0.0214	0.0216	0.908%	20%	----
		Barium, total	7440-39-3	E420	0.00020	mg/L	0.467	0.464	0.795%	20%	----
		Beryllium, total	7440-41-7	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Bismuth, total	7440-69-9	E420	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Boron, total	7440-42-8	E420	0.020	mg/L	0.352	0.362	2.69%	20%	----
		Cadmium, total	7440-43-9	E420	0.0000100	mg/L	0.000116	0.000119	2.43%	20%	----
		Calcium, total	7440-70-2	E420	0.100	mg/L	41.0	42.7	4.11%	20%	----
		Cesium, total	7440-46-2	E420	0.000020	mg/L	0.000125	0.000131	0.000007	Diff <2x LOR	----
		Chromium, total	7440-47-3	E420	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Cobalt, total	7440-48-4	E420	0.00020	mg/L	0.00190	0.00188	0.00002	Diff <2x LOR	----
		Copper, total	7440-50-8	E420	0.00100	mg/L	0.00264	0.00262	0.00003	Diff <2x LOR	----
		Iron, total	7439-89-6	E420	0.020	mg/L	3.17	3.21	1.19%	20%	----
		Lead, total	7439-92-1	E420	0.000100	mg/L	0.000556	0.000550	0.000006	Diff <2x LOR	----
		Lithium, total	7439-93-2	E420	0.0020	mg/L	0.0154	0.0159	0.0004	Diff <2x LOR	----
		Magnesium, total	7439-95-4	E420	0.0100	mg/L	36.2	35.8	0.987%	20%	----
		Manganese, total	7439-96-5	E420	0.00020	mg/L	0.115	0.116	0.752%	20%	----
		Molybdenum, total	7439-98-7	E420	0.000100	mg/L	0.0335	0.0340	1.43%	20%	----
		Nickel, total	7440-02-0	E420	0.00100	mg/L	0.0119	0.0119	0.106%	20%	----
		Phosphorus, total	7723-14-0	E420	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
		Potassium, total	7440-09-7	E420	0.100	mg/L	3.39	3.31	2.29%	20%	----
		Rubidium, total	7440-17-7	E420	0.00040	mg/L	0.00270	0.00256	0.00014	Diff <2x LOR	----
		Selenium, total	7782-49-2	E420	0.000100	mg/L	0.00315	0.00316	0.394%	20%	----
		Silicon, total	7440-21-3	E420	0.20	mg/L	4.68	4.44	5.10%	20%	----
		Silver, total	7440-22-4	E420	0.000020	mg/L	<0.000020	<0.000020	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: 1777978) - continued											
FJ2403536-001	Location 3	Sodium, total	7440-23-5	E420	0.100	mg/L	395	385	2.38%	20%	----
		Strontium, total	7440-24-6	E420	0.00040	mg/L	0.665	0.674	1.33%	20%	----
		Sulfur, total	7704-34-9	E420	1.00	mg/L	48.8	45.1	7.95%	20%	----
		Tellurium, total	13494-80-9	E420	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR	----
		Thallium, total	7440-28-0	E420	0.000020	mg/L	0.000028	0.000028	0.0000001	Diff <2x LOR	----
		Thorium, total	7440-29-1	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Tin, total	7440-31-5	E420	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Titanium, total	7440-32-6	E420	0.00060	mg/L	0.00554	0.00545	0.00009	Diff <2x LOR	----
		Tungsten, total	7440-33-7	E420	0.00020	mg/L	0.00033	0.00031	0.00002	Diff <2x LOR	----
		Uranium, total	7440-61-1	E420	0.000020	mg/L	0.00695	0.00693	0.341%	20%	----
		Vanadium, total	7440-62-2	E420	0.00100	mg/L	0.00127	0.00135	0.00008	Diff <2x LOR	----
		Zinc, total	7440-66-6	E420	0.0060	mg/L	0.0092	0.0090	0.0001	Diff <2x LOR	----
		Zirconium, total	7440-67-7	E420	0.00040	mg/L	0.00064	0.00062	0.00002	Diff <2x LOR	----
Total Metals (QC Lot: 1778474)											
FJ2403504-007	Anonymous	Mercury, total	7439-97-6	E508	0.0000050	mg/L	<0.0000050	<0.0000050	0	Diff <2x LOR	----
Dissolved Metals (QC Lot: 1778107)											
FJ2403536-001	Location 3	Aluminum, dissolved	7429-90-5	E421	0.0020	mg/L	0.0027	<0.0020	0.0007	Diff <2x LOR	----
		Antimony, dissolved	7440-36-0	E421	0.00020	mg/L	0.00671	0.00665	0.953%	20%	----
		Arsenic, dissolved	7440-38-2	E421	0.00020	mg/L	0.00623	0.00641	2.96%	20%	----
		Barium, dissolved	7440-39-3	E421	0.00020	mg/L	0.418	0.424	1.45%	20%	----
		Beryllium, dissolved	7440-41-7	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Bismuth, dissolved	7440-69-9	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Boron, dissolved	7440-42-8	E421	0.020	mg/L	0.329	0.304	7.90%	20%	----
		Cadmium, dissolved	7440-43-9	E421	0.0000100	mg/L	0.0000734	0.0000759	0.0000025	Diff <2x LOR	----
		Calcium, dissolved	7440-70-2	E421	0.100	mg/L	38.9	38.8	0.244%	20%	----
		Cesium, dissolved	7440-46-2	E421	0.000020	mg/L	0.000078	0.000074	0.000004	Diff <2x LOR	----
		Chromium, dissolved	7440-47-3	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Cobalt, dissolved	7440-48-4	E421	0.00020	mg/L	0.00174	0.00173	0.000008	Diff <2x LOR	----
		Copper, dissolved	7440-50-8	E421	0.00040	mg/L	0.00055	0.00055	0.0000005	Diff <2x LOR	----
		Iron, dissolved	7439-89-6	E421	0.020	mg/L	0.787	0.778	1.09%	20%	----
		Lead, dissolved	7439-92-1	E421	0.000100	mg/L	<0.000100	<0.000100	0	Diff <2x LOR	----
		Lithium, dissolved	7439-93-2	E421	0.0020	mg/L	0.0141	0.0138	0.0002	Diff <2x LOR	----
		Magnesium, dissolved	7439-95-4	E421	0.0100	mg/L	34.2	34.8	1.82%	20%	----
		Manganese, dissolved	7439-96-5	E421	0.00020	mg/L	0.112	0.114	1.59%	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: 1778107) - continued											
FJ2403536-001	Location 3	Molybdenum, dissolved	7439-98-7	E421	0.000100	mg/L	0.0304	0.0300	1.08%	20%	----
		Nickel, dissolved	7440-02-0	E421	0.00100	mg/L	0.0111	0.0113	1.99%	20%	----
		Phosphorus, dissolved	7723-14-0	E421	0.100	mg/L	<0.100	<0.100	0	Diff <2x LOR	----
		Potassium, dissolved	7440-09-7	E421	0.100	mg/L	3.39	3.42	0.835%	20%	----
		Rubidium, dissolved	7440-17-7	E421	0.00040	mg/L	0.00238	0.00244	0.00006	Diff <2x LOR	----
		Selenium, dissolved	7782-49-2	E421	0.000100	mg/L	0.00301	0.00306	1.52%	20%	----
		Silicon, dissolved	7440-21-3	E421	0.100	mg/L	4.07	4.00	1.73%	20%	----
		Silver, dissolved	7440-22-4	E421	0.000020	mg/L	<0.000020	<0.000020	0	Diff <2x LOR	----
		Sodium, dissolved	7440-23-5	E421	0.100	mg/L	401	405	0.881%	20%	----
		Strontium, dissolved	7440-24-6	E421	0.00040	mg/L	0.598	0.595	0.558%	20%	----
		Sulfur, dissolved	7704-34-9	E421	1.00	mg/L	42.8	41.8	2.40%	20%	----
		Tellurium, dissolved	13494-80-9	E421	0.00040	mg/L	<0.00040	<0.00040	0	Diff <2x LOR	----
		Thallium, dissolved	7440-28-0	E421	0.000020	mg/L	0.000023	0.000021	0.000002	Diff <2x LOR	----
		Thorium, dissolved	7440-29-1	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Tin, dissolved	7440-31-5	E421	0.00020	mg/L	<0.00020	<0.00020	0	Diff <2x LOR	----
		Titanium, dissolved	7440-32-6	E421	0.00060	mg/L	<0.00060	<0.00060	0	Diff <2x LOR	----
		Tungsten, dissolved	7440-33-7	E421	0.00020	mg/L	0.00030	0.00029	0.000007	Diff <2x LOR	----
		Uranium, dissolved	7440-61-1	E421	0.000020	mg/L	0.00624	0.00621	0.481%	20%	----
		Vanadium, dissolved	7440-62-2	E421	0.00100	mg/L	<0.00100	<0.00100	0	Diff <2x LOR	----
		Zinc, dissolved	7440-66-6	E421	0.0020	mg/L	0.0043	0.0044	0.0001	Diff <2x LOR	----
		Zirconium, dissolved	7440-67-7	E421	0.00040	mg/L	0.00041	<0.00040	0.00001	Diff <2x LOR	----
Dissolved Metals (QC Lot: 1778479)											
FJ2403504-007	Anonymous	Mercury, dissolved	7439-97-6	E509	0.0000050	mg/L	<0.0000050	<0.0000050	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: 1778085)						
Solids, total dissolved [TDS]	----	E162	10	mg/L	<10	----
Physical Tests (QCLot: 1778435)						
Alkalinity, bicarbonate (as CaCO3)	----	E290	1	mg/L	<1.0	----
Alkalinity, carbonate (as CaCO3)	----	E290	1	mg/L	<1.0	----
Alkalinity, hydroxide (as CaCO3)	----	E290	1	mg/L	<1.0	----
Alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	<1.0	----
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	<1.0	----
Physical Tests (QCLot: 1778436)						
Conductivity	----	E100	1	µS/cm	<1.0	----
Physical Tests (QCLot: 1778443)						
Colour, true	----	E329	5	CU	<5.0	----
Physical Tests (QCLot: 1779281)						
Turbidity	----	E121	0.1	NTU	<0.10	----
Physical Tests (QCLot: 1779752)						
Absorbance, UV (@ 254nm)	----	E404	0.005	AU/cm	<0.0050	----
Anions and Nutrients (QCLot: 1778437)						
Fluoride	16984-48-8	E235.F	0.02	mg/L	<0.020	----
Anions and Nutrients (QCLot: 1778438)						
Chloride	16887-00-6	E235.Cl	0.5	mg/L	<0.50	----
Anions and Nutrients (QCLot: 1778439)						
Bromide	24959-67-9	E235.Br-L	0.05	mg/L	<0.050	----
Anions and Nutrients (QCLot: 1778440)						
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	<0.0050	----
Anions and Nutrients (QCLot: 1778441)						
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	<0.0010	----
Anions and Nutrients (QCLot: 1778442)						
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	<0.30	----
Cyanides (QCLot: 1778955)						
Cyanide, strong acid dissociable (Total)	----	E333	0.002	mg/L	<0.0020	----
Organic / Inorganic Carbon (QCLot: 1777537)						
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	<0.50	----
Organic / Inorganic Carbon (QCLot: 1777538)						

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Organic / Inorganic Carbon (QCLot: 1777538) - continued						
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	<0.50	----
Total Sulfides (QCLot: 1778131)						
Sulfide, total (as S)	18496-25-8	E395-H	0.01	mg/L	<0.010	----
Total Metals (QCLot: 1777978)						
Aluminum, total	7429-90-5	E420	0.003	mg/L	<0.0030	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	<0.00010	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	<0.00010	----
Barium, total	7440-39-3	E420	0.0001	mg/L	<0.00010	----
Beryllium, total	7440-41-7	E420	0.00002	mg/L	<0.000020	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	<0.000050	----
Boron, total	7440-42-8	E420	0.01	mg/L	<0.010	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	<0.0000050	----
Calcium, total	7440-70-2	E420	0.05	mg/L	<0.050	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	<0.000010	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	<0.00050	----
Cobalt, total	7440-48-4	E420	0.0001	mg/L	<0.00010	----
Copper, total	7440-50-8	E420	0.0005	mg/L	<0.00050	----
Iron, total	7439-89-6	E420	0.01	mg/L	<0.010	----
Lead, total	7439-92-1	E420	0.00005	mg/L	<0.000050	----
Lithium, total	7439-93-2	E420	0.001	mg/L	<0.0010	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	<0.0050	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	<0.00010	----
Molybdenum, total	7439-98-7	E420	0.00005	mg/L	<0.000050	----
Nickel, total	7440-02-0	E420	0.0005	mg/L	<0.00050	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	<0.050	----
Potassium, total	7440-09-7	E420	0.05	mg/L	<0.050	----
Rubidium, total	7440-17-7	E420	0.0002	mg/L	<0.00020	----
Selenium, total	7782-49-2	E420	0.00005	mg/L	<0.000050	----
Silicon, total	7440-21-3	E420	0.1	mg/L	<0.10	----
Silver, total	7440-22-4	E420	0.00001	mg/L	<0.000010	----
Sodium, total	7440-23-5	E420	0.05	mg/L	<0.050	----
Strontium, total	7440-24-6	E420	0.0002	mg/L	<0.00020	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	<0.50	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	<0.00020	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	<0.000010	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Total Metals (QCLot: 1777978) - continued						
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	----
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: 1778474)						
Mercury, total	7439-97-6	E508	0.000005	mg/L	<0.0000050	----
Dissolved Metals (QCLot: 1778107)						
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	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Result	Qualifier
Dissolved Metals (QCLot: 1778107) - continued						
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	----
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: 1778479)						
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	<0.0000050	----

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	Target Concentration	LCS	Low	High	Qualifier
Physical Tests (QCLot: 1778085)									
Solids, total dissolved [TDS]	----	E162	10	mg/L	1000 mg/L	107	85.0	115	----
Physical Tests (QCLot: 1778434)									
pH	----	E108	----	pH units	7 pH units	100	98.0	102	----
Physical Tests (QCLot: 1778435)									
Alkalinity, phenolphthalein (as CaCO3)	----	E290	1	mg/L	229 mg/L	124	75.0	125	----
Alkalinity, total (as CaCO3)	----	E290	1	mg/L	500 mg/L	104	85.0	115	----
Physical Tests (QCLot: 1778436)									
Conductivity	----	E100	1	µS/cm	147 µS/cm	99.4	90.0	110	----
Physical Tests (QCLot: 1778443)									
Colour, true	----	E329	5	CU	100 CU	104	85.0	115	----
Physical Tests (QCLot: 1779281)									
Turbidity	----	E121	0.1	NTU	200 NTU	99.5	85.0	115	----
Physical Tests (QCLot: 1779752)									
Absorbance, UV (@ 254nm)	----	E404	0.005	AU/cm	0.693 AU/cm	93.8	85.0	115	----
Transmittance, UV (@ 254nm)	----	E404	----	% T/cm	20.3 % T/cm	110	85.0	115	----
Anions and Nutrients (QCLot: 1778437)									
Fluoride	16984-48-8	E235.F	0.02	mg/L	1 mg/L	97.9	90.0	110	----
Anions and Nutrients (QCLot: 1778438)									
Chloride	16887-00-6	E235.Cl	0.5	mg/L	100 mg/L	99.2	90.0	110	----
Anions and Nutrients (QCLot: 1778439)									
Bromide	24959-67-9	E235.Br-L	0.05	mg/L	0.5 mg/L	104	85.0	115	----
Anions and Nutrients (QCLot: 1778440)									
Nitrate (as N)	14797-55-8	E235.NO3-L	0.005	mg/L	2.5 mg/L	97.9	90.0	110	----
Anions and Nutrients (QCLot: 1778441)									
Nitrite (as N)	14797-65-0	E235.NO2-L	0.001	mg/L	0.5 mg/L	97.7	90.0	110	----
Anions and Nutrients (QCLot: 1778442)									
Sulfate (as SO4)	14808-79-8	E235.SO4	0.3	mg/L	100 mg/L	99.1	90.0	110	----
Cyanides (QCLot: 1778955)									
Cyanide, strong acid dissociable (Total)	----	E333	0.002	mg/L	0.25 mg/L	97.1	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report: Spike: Target Concentration	Recovery (%): LCS	Recovery Limits (%): Low	Recovery Limits (%): High	Qualifier
Organic / Inorganic Carbon (QCLot: 1777537)									
Carbon, dissolved organic [DOC]	----	E358-L	0.5	mg/L	8.57 mg/L	99.6	80.0	120	----
Organic / Inorganic Carbon (QCLot: 1777538)									
Carbon, total organic [TOC]	----	E355-L	0.5	mg/L	8.57 mg/L	99.8	80.0	120	----
Total Sulfides (QCLot: 1778131)									
Sulfide, total (as H2S)	7783-06-4	E395-H	----	mg/L	0.085 mg/L	93.8	80.0	120	----
Sulfide, total (as S)	18496-25-8	E395-H	0.01	mg/L	0.08 mg/L	94.4	80.0	120	----
Total Metals (QCLot: 1777978)									
Aluminum, total	7429-90-5	E420	0.003	mg/L	2 mg/L	106	80.0	120	----
Antimony, total	7440-36-0	E420	0.0001	mg/L	1 mg/L	101	80.0	120	----
Arsenic, total	7440-38-2	E420	0.0001	mg/L	1 mg/L	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	104	80.0	120	----
Bismuth, total	7440-69-9	E420	0.00005	mg/L	1 mg/L	105	80.0	120	----
Boron, total	7440-42-8	E420	0.01	mg/L	1 mg/L	101	80.0	120	----
Cadmium, total	7440-43-9	E420	0.000005	mg/L	0.1 mg/L	102	80.0	120	----
Calcium, total	7440-70-2	E420	0.05	mg/L	50 mg/L	102	80.0	120	----
Cesium, total	7440-46-2	E420	0.00001	mg/L	0.05 mg/L	104	80.0	120	----
Chromium, total	7440-47-3	E420	0.0005	mg/L	0.25 mg/L	105	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	103	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	107	80.0	120	----
Lithium, total	7439-93-2	E420	0.001	mg/L	0.25 mg/L	104	80.0	120	----
Magnesium, total	7439-95-4	E420	0.005	mg/L	50 mg/L	103	80.0	120	----
Manganese, total	7439-96-5	E420	0.0001	mg/L	0.25 mg/L	103	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	103	80.0	120	----
Phosphorus, total	7723-14-0	E420	0.05	mg/L	10 mg/L	116	80.0	120	----
Potassium, total	7440-09-7	E420	0.05	mg/L	50 mg/L	104	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	105	80.0	120	----
Silicon, total	7440-21-3	E420	0.1	mg/L	10 mg/L	108	80.0	120	----
Silver, total	7440-22-4	E420	0.00001	mg/L	0.1 mg/L	100	80.0	120	----
Sodium, total	7440-23-5	E420	0.05	mg/L	50 mg/L	104	80.0	120	----

Sub-Matrix: **Water**

Analyte	CAS Number	Method	LOR	Unit	Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
					Target Concentration	LCS	Low	High	Qualifier
Total Metals (QCLot: 1777978) - continued									
Strontium, total	7440-24-6	E420	0.0002	mg/L	0.25 mg/L	106	80.0	120	----
Sulfur, total	7704-34-9	E420	0.5	mg/L	50 mg/L	106	80.0	120	----
Tellurium, total	13494-80-9	E420	0.0002	mg/L	0.1 mg/L	107	80.0	120	----
Thallium, total	7440-28-0	E420	0.00001	mg/L	1 mg/L	106	80.0	120	----
Thorium, total	7440-29-1	E420	0.0001	mg/L	0.1 mg/L	108	80.0	120	----
Tin, total	7440-31-5	E420	0.0001	mg/L	0.5 mg/L	102	80.0	120	----
Titanium, total	7440-32-6	E420	0.0003	mg/L	0.25 mg/L	102	80.0	120	----
Tungsten, total	7440-33-7	E420	0.0001	mg/L	0.1 mg/L	106	80.0	120	----
Uranium, total	7440-61-1	E420	0.00001	mg/L	0.005 mg/L	112	80.0	120	----
Vanadium, total	7440-62-2	E420	0.0005	mg/L	0.5 mg/L	105	80.0	120	----
Zinc, total	7440-66-6	E420	0.003	mg/L	0.5 mg/L	104	80.0	120	----
Zirconium, total	7440-67-7	E420	0.0002	mg/L	0.1 mg/L	104	80.0	120	----
Total Metals (QCLot: 1778474)									
Mercury, total	7439-97-6	E508	0.000005	mg/L	0 mg/L	94.8	80.0	120	----
Dissolved Metals (QCLot: 1778107)									
Aluminum, dissolved	7429-90-5	E421	0.001	mg/L	2 mg/L	99.5	80.0	120	----
Antimony, dissolved	7440-36-0	E421	0.0001	mg/L	1 mg/L	96.0	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	101	80.0	120	----
Beryllium, dissolved	7440-41-7	E421	0.00002	mg/L	0.1 mg/L	96.5	80.0	120	----
Bismuth, dissolved	7440-69-9	E421	0.00005	mg/L	1 mg/L	99.8	80.0	120	----
Boron, dissolved	7440-42-8	E421	0.01	mg/L	1 mg/L	93.3	80.0	120	----
Cadmium, dissolved	7440-43-9	E421	0.000005	mg/L	0.1 mg/L	104	80.0	120	----
Calcium, dissolved	7440-70-2	E421	0.05	mg/L	50 mg/L	96.6	80.0	120	----
Cesium, dissolved	7440-46-2	E421	0.00001	mg/L	0.05 mg/L	94.0	80.0	120	----
Chromium, dissolved	7440-47-3	E421	0.0005	mg/L	0.25 mg/L	101	80.0	120	----
Cobalt, dissolved	7440-48-4	E421	0.0001	mg/L	0.25 mg/L	98.7	80.0	120	----
Copper, dissolved	7440-50-8	E421	0.0002	mg/L	0.25 mg/L	99.0	80.0	120	----
Iron, dissolved	7439-89-6	E421	0.01	mg/L	1 mg/L	101	80.0	120	----
Lead, dissolved	7439-92-1	E421	0.00005	mg/L	0.5 mg/L	103	80.0	120	----
Lithium, dissolved	7439-93-2	E421	0.001	mg/L	0.25 mg/L	95.4	80.0	120	----
Magnesium, dissolved	7439-95-4	E421	0.005	mg/L	50 mg/L	99.8	80.0	120	----
Manganese, dissolved	7439-96-5	E421	0.0001	mg/L	0.25 mg/L	100	80.0	120	----
Molybdenum, dissolved	7439-98-7	E421	0.00005	mg/L	0.25 mg/L	95.0	80.0	120	----
Nickel, dissolved	7440-02-0	E421	0.0005	mg/L	0.5 mg/L	97.9	80.0	120	----

Sub-Matrix: **Water**

					Laboratory Control Sample (LCS) Report				
					Spike	Recovery (%)	Recovery Limits (%)		
Analyte	CAS Number	Method	LOR	Unit	Target Concentration	LCS	Low	High	Qualifier
Dissolved Metals (QCLot: 1778107) - continued									
Phosphorus, dissolved	7723-14-0	E421	0.05	mg/L	10 mg/L	104	80.0	120	----
Potassium, dissolved	7440-09-7	E421	0.05	mg/L	50 mg/L	99.9	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	102	80.0	120	----
Silicon, dissolved	7440-21-3	E421	0.05	mg/L	10 mg/L	107	80.0	120	----
Silver, dissolved	7440-22-4	E421	0.00001	mg/L	0.1 mg/L	88.2	80.0	120	----
Sodium, dissolved	7440-23-5	E421	0.05	mg/L	50 mg/L	104	80.0	120	----
Strontium, dissolved	7440-24-6	E421	0.0002	mg/L	0.25 mg/L	96.4	80.0	120	----
Sulfur, dissolved	7704-34-9	E421	0.5	mg/L	50 mg/L	95.6	80.0	120	----
Tellurium, dissolved	13494-80-9	E421	0.0002	mg/L	0.1 mg/L	94.9	80.0	120	----
Thallium, dissolved	7440-28-0	E421	0.00001	mg/L	1 mg/L	99.1	80.0	120	----
Thorium, dissolved	7440-29-1	E421	0.0001	mg/L	0.1 mg/L	100	80.0	120	----
Tin, dissolved	7440-31-5	E421	0.0001	mg/L	0.5 mg/L	96.4	80.0	120	----
Titanium, dissolved	7440-32-6	E421	0.0003	mg/L	0.25 mg/L	99.7	80.0	120	----
Tungsten, dissolved	7440-33-7	E421	0.0001	mg/L	0.1 mg/L	102	80.0	120	----
Uranium, dissolved	7440-61-1	E421	0.00001	mg/L	0.005 mg/L	97.3	80.0	120	----
Vanadium, dissolved	7440-62-2	E421	0.0005	mg/L	0.5 mg/L	103	80.0	120	----
Zinc, dissolved	7440-66-6	E421	0.001	mg/L	0.5 mg/L	102	80.0	120	----
Zirconium, dissolved	7440-67-7	E421	0.0002	mg/L	0.1 mg/L	90.7	80.0	120	----
Mercury, dissolved	7439-97-6	E509	0.000005	mg/L	0 mg/L	93.9	80.0	120	----

Matrix Spike (MS) Report

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

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Anions and Nutrients (QCLot: 1778437)										
VA24D1699-001	Anonymous	Fluoride	16984-48-8	E235.F	1.05 mg/L	1 mg/L	105	75.0	125	----
Anions and Nutrients (QCLot: 1778438)										
VA24D1699-001	Anonymous	Chloride	16887-00-6	E235.Cl	106 mg/L	100 mg/L	106	75.0	125	----
Anions and Nutrients (QCLot: 1778439)										
VA24D1699-001	Anonymous	Bromide	24959-67-9	E235.Br-L	0.549 mg/L	0.5 mg/L	110	75.0	125	----
Anions and Nutrients (QCLot: 1778440)										
VA24D1699-001	Anonymous	Nitrate (as N)	14797-55-8	E235.NO3-L	2.58 mg/L	2.5 mg/L	103	75.0	125	----
Anions and Nutrients (QCLot: 1778441)										
VA24D1699-001	Anonymous	Nitrite (as N)	14797-65-0	E235.NO2-L	0.520 mg/L	0.5 mg/L	104	75.0	125	----
Anions and Nutrients (QCLot: 1778442)										
VA24D1699-001	Anonymous	Sulfate (as SO4)	14808-79-8	E235.SO4	103 mg/L	100 mg/L	103	75.0	125	----
Total Metals (QCLot: 1777978)										
VA24D1615-001	Anonymous	Aluminum, total	7429-90-5	E420	0.179 mg/L	0.2 mg/L	89.4	70.0	130	----
		Antimony, total	7440-36-0	E420	0.0183 mg/L	0.02 mg/L	91.4	70.0	130	----
		Arsenic, total	7440-38-2	E420	0.0194 mg/L	0.02 mg/L	96.8	70.0	130	----
		Barium, total	7440-39-3	E420	0.0192 mg/L	0.02 mg/L	95.8	70.0	130	----
		Beryllium, total	7440-41-7	E420	0.0395 mg/L	0.04 mg/L	98.8	70.0	130	----
		Bismuth, total	7440-69-9	E420	0.00954 mg/L	0.01 mg/L	95.4	70.0	130	----
		Boron, total	7440-42-8	E420	0.097 mg/L	0.1 mg/L	96.8	70.0	130	----
		Cadmium, total	7440-43-9	E420	0.00399 mg/L	0.004 mg/L	99.8	70.0	130	----
		Calcium, total	7440-70-2	E420	3.87 mg/L	4 mg/L	96.7	70.0	130	----
		Cesium, total	7440-46-2	E420	0.00993 mg/L	0.01 mg/L	99.3	70.0	130	----
		Chromium, total	7440-47-3	E420	0.0389 mg/L	0.04 mg/L	97.3	70.0	130	----
		Cobalt, total	7440-48-4	E420	0.0194 mg/L	0.02 mg/L	96.9	70.0	130	----
		Copper, total	7440-50-8	E420	0.0194 mg/L	0.02 mg/L	96.8	70.0	130	----
		Iron, total	7439-89-6	E420	1.95 mg/L	2 mg/L	97.4	70.0	130	----
		Lead, total	7439-92-1	E420	0.0195 mg/L	0.02 mg/L	97.4	70.0	130	----
		Lithium, total	7439-93-2	E420	0.0973 mg/L	0.1 mg/L	97.3	70.0	130	----
		Magnesium, total	7439-95-4	E420	0.954 mg/L	1 mg/L	95.4	70.0	130	----
		Manganese, total	7439-96-5	E420	0.0190 mg/L	0.02 mg/L	95.0	70.0	130	----
		Molybdenum, total	7439-98-7	E420	0.0191 mg/L	0.02 mg/L	95.4	70.0	130	----
		Nickel, total	7440-02-0	E420	0.0385 mg/L	0.04 mg/L	96.2	70.0	130	----
		Phosphorus, total	7723-14-0	E420	9.69 mg/L	10 mg/L	96.9	70.0	130	----
		Potassium, total	7440-09-7	E420	3.83 mg/L	4 mg/L	95.8	70.0	130	----
		Rubidium, total	7440-17-7	E420	0.0191 mg/L	0.02 mg/L	95.6	70.0	130	----
		Selenium, total	7782-49-2	E420	0.0399 mg/L	0.04 mg/L	99.7	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: 1777978) - continued										
VA24D1615-001	Anonymous	Silicon, total	7440-21-3	E420	9.42 mg/L	10 mg/L	94.2	70.0	130	----
		Silver, total	7440-22-4	E420	0.00392 mg/L	0.004 mg/L	98.1	70.0	130	----
		Sodium, total	7440-23-5	E420	ND mg/L	----	ND	70.0	130	----
		Strontium, total	7440-24-6	E420	0.0202 mg/L	0.02 mg/L	101	70.0	130	----
		Sulfur, total	7704-34-9	E420	18.9 mg/L	20 mg/L	94.3	70.0	130	----
		Tellurium, total	13494-80-9	E420	0.0406 mg/L	0.04 mg/L	101	70.0	130	----
		Thallium, total	7440-28-0	E420	0.00380 mg/L	0.004 mg/L	94.9	70.0	130	----
		Thorium, total	7440-29-1	E420	0.0195 mg/L	0.02 mg/L	97.6	70.0	130	----
		Tin, total	7440-31-5	E420	0.0189 mg/L	0.02 mg/L	94.3	70.0	130	----
		Titanium, total	7440-32-6	E420	0.0381 mg/L	0.04 mg/L	95.2	70.0	130	----
		Tungsten, total	7440-33-7	E420	0.0187 mg/L	0.02 mg/L	93.5	70.0	130	----
		Uranium, total	7440-61-1	E420	0.00390 mg/L	0.004 mg/L	97.4	70.0	130	----
		Vanadium, total	7440-62-2	E420	0.0963 mg/L	0.1 mg/L	96.3	70.0	130	----
		Zinc, total	7440-66-6	E420	0.391 mg/L	0.4 mg/L	97.7	70.0	130	----
		Zirconium, total	7440-67-7	E420	0.0380 mg/L	0.04 mg/L	94.9	70.0	130	----
Total Metals (QCLot: 1778474)										
FJ2403504-008	Anonymous	Mercury, total	7439-97-6	E508	0.0000966 mg/L	0 mg/L	96.6	70.0	130	----
Dissolved Metals (QCLot: 1778107)										
FJ2403537-001	Anonymous	Aluminum, dissolved	7429-90-5	E421	0.189 mg/L	0.2 mg/L	94.6	70.0	130	----
		Antimony, dissolved	7440-36-0	E421	0.0190 mg/L	0.02 mg/L	95.1	70.0	130	----
		Arsenic, dissolved	7440-38-2	E421	0.0204 mg/L	0.02 mg/L	102	70.0	130	----
		Barium, dissolved	7440-39-3	E421	ND mg/L	----	ND	70.0	130	----
		Beryllium, dissolved	7440-41-7	E421	0.0380 mg/L	0.04 mg/L	95.1	70.0	130	----
		Bismuth, dissolved	7440-69-9	E421	0.00920 mg/L	0.01 mg/L	92.0	70.0	130	----
		Boron, dissolved	7440-42-8	E421	0.093 mg/L	0.1 mg/L	92.6	70.0	130	----
		Cadmium, dissolved	7440-43-9	E421	0.00399 mg/L	0.004 mg/L	99.8	70.0	130	----
		Calcium, dissolved	7440-70-2	E421	ND mg/L	----	ND	70.0	130	----
		Cesium, dissolved	7440-46-2	E421	0.00963 mg/L	0.01 mg/L	96.3	70.0	130	----
		Chromium, dissolved	7440-47-3	E421	0.0388 mg/L	0.04 mg/L	97.1	70.0	130	----
		Cobalt, dissolved	7440-48-4	E421	0.0193 mg/L	0.02 mg/L	96.6	70.0	130	----
		Copper, dissolved	7440-50-8	E421	0.0191 mg/L	0.02 mg/L	95.5	70.0	130	----
		Iron, dissolved	7439-89-6	E421	1.91 mg/L	2 mg/L	95.3	70.0	130	----
		Lead, dissolved	7439-92-1	E421	0.0190 mg/L	0.02 mg/L	95.2	70.0	130	----
		Lithium, dissolved	7439-93-2	E421	0.0947 mg/L	0.1 mg/L	94.7	70.0	130	----
		Magnesium, dissolved	7439-95-4	E421	ND mg/L	----	ND	70.0	130	----
		Manganese, dissolved	7439-96-5	E421	0.0192 mg/L	0.02 mg/L	96.0	70.0	130	----
		Molybdenum, dissolved	7439-98-7	E421	0.0192 mg/L	0.02 mg/L	96.1	70.0	130	----
		Nickel, dissolved	7440-02-0	E421	0.0379 mg/L	0.04 mg/L	94.9	70.0	130	----
		Phosphorus, dissolved	7723-14-0	E421	9.80 mg/L	10 mg/L	98.0	70.0	130	----
		Potassium, dissolved	7440-09-7	E421	3.90 mg/L	4 mg/L	97.4	70.0	130	----
		Rubidium, dissolved	7440-17-7	E421	0.0198 mg/L	0.02 mg/L	98.8	70.0	130	----
		Selenium, dissolved	7782-49-2	E421	0.0399 mg/L	0.04 mg/L	99.7	70.0	130	----
		Silicon, dissolved	7440-21-3	E421	9.02 mg/L	10 mg/L	90.2	70.0	130	----

Sub-Matrix: **Water**

					Matrix Spike (MS) Report					
					Spike		Recovery (%)	Recovery Limits (%)		
Laboratory sample ID	Client sample ID	Analyte	CAS Number	Method	Concentration	Target	MS	Low	High	Qualifier
Dissolved Metals (QCLot: 1778107) - continued										
FJ2403537-001	Anonymous	Silver, dissolved	7440-22-4	E421	0.00385 mg/L	0.004 mg/L	96.3	70.0	130	----
		Sodium, dissolved	7440-23-5	E421	2.04 mg/L	2 mg/L	102	70.0	130	----
		Strontium, dissolved	7440-24-6	E421	ND mg/L	----	ND	70.0	130	----
		Sulfur, dissolved	7704-34-9	E421	19.4 mg/L	20 mg/L	97.1	70.0	130	----
		Tellurium, dissolved	13494-80-9	E421	0.0394 mg/L	0.04 mg/L	98.4	70.0	130	----
		Thallium, dissolved	7440-28-0	E421	0.00370 mg/L	0.004 mg/L	92.4	70.0	130	----
		Thorium, dissolved	7440-29-1	E421	0.0198 mg/L	0.02 mg/L	99.1	70.0	130	----
		Tin, dissolved	7440-31-5	E421	0.0192 mg/L	0.02 mg/L	96.3	70.0	130	----
		Titanium, dissolved	7440-32-6	E421	0.0395 mg/L	0.04 mg/L	98.8	70.0	130	----
		Tungsten, dissolved	7440-33-7	E421	0.0190 mg/L	0.02 mg/L	95.3	70.0	130	----
		Uranium, dissolved	7440-61-1	E421	0.00365 mg/L	0.004 mg/L	91.2	70.0	130	----
		Vanadium, dissolved	7440-62-2	E421	0.0984 mg/L	0.1 mg/L	98.4	70.0	130	----
		Zinc, dissolved	7440-66-6	E421	0.392 mg/L	0.4 mg/L	98.0	70.0	130	----
		Zirconium, dissolved	7440-67-7	E421	0.0380 mg/L	0.04 mg/L	95.1	70.0	130	----
Dissolved Metals (QCLot: 1778479)										
FJ2403524-001	Anonymous	Mercury, dissolved	7439-97-6	E509	0.0000946 mg/L	0 mg/L	94.6	70.0	130	----

FJAE Shipping & Receiving
Call Out — Expedite
Priority
1 # of Coolers — ✓ Air
# of Carboys — Ground

Chain of Custody (COC) / Analytical Request Form

COC Number: 20 - 964972

Canada Toll Free: 1 800 668 9878

Page

Environmental Division
Fort St. John
Work Order Reference
FJ2403536

Telephone : +1 250 261 5517

Report To	Reports / Recipients	Turnaround Time (TAT) Requested
Company: Tetra Tech Canada Inc	Select Report Format: ☐ PDF ☐ EXCEL ☐ EDD (DIGITAL)	☐ Routine [R] if received by 3pm M-F - no surcharges apply
Contact:	Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A	☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
Phone:	☐ Compare Results to Criteria on Report - provide details below if box checked	☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
Company address below will appear on the final report	Select Distribution: ☐ EMAIL ☐ MAIL ☐ FAX	☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
Street:	Email 1 or Fax	☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
City/Province:	Email 2	☐ Same day [E2] if received by 10am M-S - 200% rush surcharge. Additi may apply to rush requests on weekends, statutory holidays and non-ro
Postal Code:	Email 3	Date and Time Required for all E&P TATs:
Invoice To: Same as Report To ☐ YES ☐ NO	Invoice Recipients	For all tests with rush TATs requested, please c
Copy of Invoice with Report ☐ YES ☐ NO	Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX	Analysis Re
Company: Tetra Tech Canada Inc	Email 1 or Fax	
Contact:	Email 2	

Project Information	Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	AFE/Cost Center:	PO#
Job #: VA24-EBAE100-013	Major/Minor Code:	Routing Code:
PO / AFE:	Requisitioner:	
LSD:	Location:	
ALS Lab Work Order # (ALS use only):	ALS Contact:	Sampler:

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS (Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRE	SUSPECTED HAZARD (see notes
	Cyanides	20-11-2024	11:39		1 (P)			
	General/TSS/TDS Routine	20-11-2024	11:35		1 (F)			
	Metals + Mercury	20-11-2024	11:40		2 (F)			
	Methane, Ethane, Ethene	20-11-2024	11:45		2 (F/P)			
	NUT/DOC/DKN/TDN/TDP/DNH3	20-11-2024	11:50		1 (F/P)			
	NUT/TOC/COD/TKN/TN/TP/NH3/PHEN	20-11-2024	10:35		1 (F/P)			
	Sulfide-Total	20-11-2024	12:00		1 (P)			

Drinking Water (DW) Samples[1] (client use)	Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)
Are samples taken from a Regulated DW System? ☐ YES ☐ NO	
Are samples for human consumption/ use? ☐ YES ☐ NO	

SAMPLE RECEIPT DETAILS (ALS use only)

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

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

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

INITIAL COOLER TEMPERATURES °C				FINAL COOLER TEMPERATURES °C			
12.5							

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by: LEROY LEDFORD	Date: 20/11/2024	Time: 12:47	Received by: [redacted]	Date: NOV 20/24	Time: 12:45	Received by:	Date:	Time:

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

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

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

FJAE Shipping & Receiving
___ Call Out ___ Expedite
___ Priority
1 # of Coolers ✓ Air
___ # of Carboys ___ Ground

Chain of Custody (COC) / Analytical Request Form

COC Number: 20 - 964972

Canada Toll Free: 1 800 668 9878

Page

Environmental Division
Fort St. John
Work Order Reference
FJ2403536

Telephone : + 1 250 261 5517

Report To	Reports / Recipients	Turnaround Time (TAT) Requested
Company: Tetra Tech Canada Inc	Select Report Format: ☐ PDF ☐ EXCEL ☐ EDD (DIGITAL)	☐ Routine [R] if received by 3pm M-F - no surcharges apply
Contact:	Merge QC/QCI Reports with COA ☐ YES ☐ NO ☐ N/A	☐ 4 day [P4] if received by 3pm M-F - 20% rush surcharge minimum
Phone:	☐ Compare Results to Criteria on Report - provide details below if box checked	☐ 3 day [P3] if received by 3pm M-F - 25% rush surcharge minimum
Company address below will appear on the final report	Select Distribution: ☐ EMAIL ☐ MAIL ☐ FAX	☐ 2 day [P2] if received by 3pm M-F - 50% rush surcharge minimum
Street:	Email 1 or Fax	☐ 1 day [E] if received by 3pm M-F - 100% rush surcharge minimum
City/Province:	Email 2	☐ same day [E2] if received by 10am M-S - 200% rush surcharge. Additional fees may apply to rush requests on weekends, statutory holidays and non-routine tests.
Postal Code:	Email 3	Date and Time Required for all E&P TATs:
Invoice To Same as Report To ☐ YES ☐ NO	**Invoice Recipients**	For all tests with rush TATs requested, please contact your AM to confirm availability.
Copy of Invoice with Report ☐ YES ☐ NO	Select Invoice Distribution: ☐ EMAIL ☐ MAIL ☐ FAX	Analysis Request
Company: Tetra Tech Canada Inc	Email 1 or Fax	
Contact:	Email 2	

Project Information	Oil and Gas Required Fields (client use)	
ALS Account # / Quote #:	AFE/Cost Center:	PO#
Job #: VA24-EBAE100-013	Major/Minor Code:	Routing Code:
PO / AFE:	Requisitioner:	
LSD:	Location:	
ALS Lab Work Order # (ALS use only):	ALS Contact:	Sampler:

ALS Sample # (ALS use only)	Sample Identification and/or Coordinates (This description will appear on the report)	Date (dd-mmm-yy)	Time (hh:mm)	Sample Type	NUMBER OF CONTAINERS (Indicate Filtered (F), Preserved (P) or Filtered and Preserved (F/P) below)	SAMPLES ON HOLD	EXTENDED STORAGE REQUIRED	SUSPECTED HAZARD (see notes)
	Cyanides	20-11-2024	11:30		P 1			
	General/TSS/TDS Routine	20-11-2024	11:35		F 1			
	Metals + Mercury	20-11-2024	11:40		F 2			
	Methane, Ethane, Ethene	20-11-2024	11:45		F/P 2			
	NUT/DOC/DKN/TDN/TDP/DNH3	20-11-2024	11:50		F/P 1			
	NUT/TOC/COD/TKN/TN/TP/NH3/PHEN	20-11-2024	14:35		F/P 1			
	SUlfide-Total	20-11-2024	12:00		P 1			

Drinking Water (DW) Samples[1] (client use)	Notes / Specify Limits for result evaluation by selecting from drop-down below (Excel COC only)
Are samples taken from a Regulated DW System? ☐ YES ☐ NO	
Are samples for human consumption/ use? ☐ YES ☐ NO	

SAMPLE RECEIPT DETAILS (ALS use only)

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

Submission Comments identified on Sample Receipt Notification: ☐ YES ☐ NO

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

INITIAL COOLER TEMPERATURES °C					FINAL COOLER TEMPERATURES °C				
12.5								5	

SHIPMENT RELEASE (client use)			INITIAL SHIPMENT RECEPTION (ALS use only)			FINAL SHIPMENT RECEPTION (ALS use only)		
Released by: LEROY LEDFORD	Date: 20/11/2024	Time: 1247	Received by: [redacted]	Date: NOV 20/24	Time: 12:45	Received by: SC	Date:	Time: 10am

Rcvd 21Nov2024

REFER TO BACK PAGE FOR ALS LOCATIONS AND SAMPLING INFORMATION

WHITE - LABORATORY COPY YELLOW - CLIENT COPY

ALS 2020 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.

APPENDIX C

TETRA TECH'S LIMITATIONS ON THE USE OF THIS DOCUMENT

LIMITATIONS ON USE OF THIS DOCUMENT

GEOENVIRONMENTAL

1.1 USE OF DOCUMENT AND OWNERSHIP

This document pertains to a specific site, a specific development, and a specific scope of work. The document may include plans, drawings, profiles and other supporting documents that collectively constitute the document (the "Professional Document").

The Professional Document is intended for the sole use of TETRA TECH's Client (the "Client") as specifically identified in the TETRA TECH Services Agreement or other Contractual Agreement entered into with the Client (either of which is termed the "Contract" herein). TETRA TECH does not accept any responsibility for the accuracy of any of the data, analyses, recommendations or other contents of the Professional Document when it is used or relied upon by any party other than the Client, unless authorized in writing by TETRA TECH.

Any unauthorized use of the Professional Document is at the sole risk of the user. TETRA TECH accepts no responsibility whatsoever for any loss or damage where such loss or damage is alleged to be or, is in fact, caused by the unauthorized use of the Professional Document.

Where TETRA TECH has expressly authorized the use of the Professional Document by a third party (an "Authorized Party"), consideration for such authorization is the Authorized Party's acceptance of these Limitations on Use of this Document as well as any limitations on liability contained in the Contract with the Client (all of which is collectively termed the "Limitations on Liability"). The Authorized Party should carefully review both these Limitations on Use of this Document and the Contract prior to making any use of the Professional Document. Any use made of the Professional Document by an Authorized Party constitutes the Authorized Party's express acceptance of, and agreement to, the Limitations on Liability.

The Professional Document and any other form or type of data or documents generated by TETRA TECH during the performance of the work are TETRA TECH's professional work product and shall remain the copyright property of TETRA TECH.

The Professional Document is subject to copyright and shall not be reproduced either wholly or in part without the prior, written permission of TETRA TECH. Additional copies of the Document, if required, may be obtained upon request.

1.2 ALTERNATIVE DOCUMENT FORMAT

Where TETRA TECH submits electronic file and/or hard copy versions of the Professional Document or any drawings or other project-related documents and deliverables (collectively termed TETRA TECH's "Instruments of Professional Service"), only the signed and/or sealed versions shall be considered final. The original signed and/or sealed electronic file and/or hard copy version archived by TETRA TECH shall be deemed to be the original. TETRA TECH will archive a protected digital copy of the original signed and/or sealed version for a period of 10 years.

Both electronic file and/or hard copy versions of TETRA TECH's Instruments of Professional Service shall not, under any circumstances, be altered by any party except TETRA TECH. TETRA TECH's Instruments of Professional Service will be used only and exactly as submitted by TETRA TECH.

Electronic files submitted by TETRA TECH have been prepared and submitted using specific software and hardware systems. TETRA TECH makes no representation about the compatibility of these files with the Client's current or future software and hardware systems.

1.3 STANDARD OF CARE

Services performed by TETRA TECH for the Professional Document have been conducted in accordance with the Contract, in a manner consistent with the level of skill ordinarily exercised by members of the profession currently practicing under similar conditions in the jurisdiction in which the services are provided. Professional judgment has been applied in developing the conclusions and/or recommendations provided in this Professional Document. No warranty or guarantee, express or implied, is made concerning the test results, comments, recommendations, or any other portion of the Professional Document.

If any error or omission is detected by the Client or an Authorized Party, the error or omission must be immediately brought to the attention of TETRA TECH.

1.4 DISCLOSURE OF INFORMATION BY CLIENT

The Client acknowledges that it has fully cooperated with TETRA TECH with respect to the provision of all available information on the past, present, and proposed conditions on the site, including historical information respecting the use of the site. The Client further acknowledges that in order for TETRA TECH to properly provide the services contracted for in the Contract, TETRA TECH has relied upon the Client with respect to both the full disclosure and accuracy of any such information.

1.5 INFORMATION PROVIDED TO TETRA TECH BY OTHERS

During the performance of the work and the preparation of this Professional Document, TETRA TECH may have relied on information provided by third parties other than the Client.

While TETRA TECH endeavours to verify the accuracy of such information, TETRA TECH accepts no responsibility for the accuracy or the reliability of such information even where inaccurate or unreliable information impacts any recommendations, design or other deliverables and causes the Client or an Authorized Party loss or damage.

1.6 GENERAL LIMITATIONS OF DOCUMENT

This Professional Document is based solely on the conditions presented and the data available to TETRA TECH at the time the data were collected in the field or gathered from available databases.

The Client, and any Authorized Party, acknowledges that the Professional Document is based on limited data and that the conclusions, opinions, and recommendations contained in the Professional Document are the result of the application of professional judgment to such limited data.

The Professional Document is not applicable to any other sites, nor should it be relied upon for types of development other than those to which it refers. Any variation from the site conditions present, or variation in assumed conditions which might form the basis of design or recommendations as outlined in this report, at or on the development proposed as of the date of the Professional Document requires a supplementary exploration, investigation, and assessment.

TETRA TECH is neither qualified to, nor is it making, any recommendations with respect to the purchase, sale, investment or development of the property, the decisions on which are the sole responsibility of the Client.

1.7 NOTIFICATION OF AUTHORITIES

In certain instances, the discovery of hazardous substances or conditions and materials may require that regulatory agencies and other persons be informed and the client agrees that notification to such bodies or persons as required may be done by TETRA TECH in its reasonably exercised discretion.

PEACE RIVER REGIONAL DISTRICT

Electoral Area Directors Committee DIARY

Item		Notes	Diarized
1.	Natural Gas	Expansion of services to rural areas	May 27, 2019
2.	Section 381 - Cost sharing for services under Part 14 (Planning and Land Use Management) of the *Local Government Act.*	Staff to contact the Ministry of Municipal Affairs to set up a zoom meeting with the Electoral Area Directors.	August 15, 2019
3.	Agriculture Advisory Committee	Staff to gather feedback from stakeholders on the relevancy of this Committee, and what they would like to see included in a Terms of Reference if the Committee was reestablished.	March 14, 2024
4.	Agriculture of the Future	Innovation model for supporting the next generation of farmers.	December 14, 2024
			Updated: Dec. 17 2024

Electoral Area Director's Committee
Terms of Reference

1. Membership

1.1 The Electoral Area Directors' Committee membership shall be elected representatives from Electoral Area 'B', Electoral Area 'C', Electoral Area 'D', and Electoral Area 'E'.

2. Terms of Reference

2.1 The Electoral Area Directors' Committee will meet to address issues of a rural nature.

2.2 Meetings will be open to the public.

2.3 The Electoral Area Directors' Committee will be chaired by an Electoral Area Director elected by the committee participants.

2.4 The Electoral Area Directors' Committee will hold meetings the third Thursday of each month or at the call of the Chair.

2.5 Electoral Area Directors' Committee meetings will be funded through the Legislative – Electoral Area budget under "Electoral Area Business". Only Electoral Area Directors will be compensated for attending meetings.

2.6 Agenda items for the Electoral Area Directors' Committee meetings will include items that are:

a. referred to the meeting by resolution of the Regional Board; or,
b. of a purely rural nature.

2.7 Items for the regular agenda must be provided to Administration by noon the Friday prior to the scheduled meeting.

2.8 All recommendations of the Committee shall be determined by majority vote of the Electoral Area Directors.

2.9 Staff will prepare minutes and forward recommendations to the Regional Board for consideration.

2.10 Committee recommendations will be ratified by the Regional Board prior to staff action being undertaken, unless previously authorized by a referring Board resolution.

Date Committee Established	February 27, 2003	Board Resolution #	RD/03/02/02 (27)
Date TOR Approved by Board	January 22, 2004	Board Resolution #	RD/04/01/20 (22)
Amendment Date		Board Resolution #	
Amendment Date		Board Resolution #	
Amendment Date		Board Resolution #	

PEACE RIVER REGIONAL DISTRICT

REPORT

To: Electoral Directors Committee Report Number: ADM-EADC-061

From: Olivia Lundahl, Electoral Area Officer Date: February 13, 2025

Subject: Notice of Closed EADC Session – February 13, 2025

RECOMMENDATION: *[Corporate Unweighted]*

That the Electoral Area Directors Committee recess to a Closed Meeting for the purpose of discussing the following items:

Agenda Item	Description	Authority
3.1	Closed Meeting Minutes	CC Section 97(1)(b) Closed Minutes, Access to Records.
5.1	Rolla Dyke	CC Section 90 (1)(g) Litigation or potential litigation and CC Section 90 (1)(i) Receipt of advice to solicitor-client privilege

BACKGROUND/RATIONALE:

As per the Closed Meeting Process and Proactive Disclosure Policy.

ALTERNATIVE OPTIONS:

The Electoral Area Directors Committee may recess to a Closed Meeting to discuss whether or not the items proposed properly belong in a Closed Session as per *Community Charter* Section 90(1)(n).

STRATEGIC PLAN RELEVANCE:

☒ Not Applicable to Strategic Plan.

FINANCIAL CONSIDERATION(S):

Not applicable.

COMMUNICATIONS CONSIDERATION(S):

Not applicable.

OTHER CONSIDERATION(S):

Not applicable.